# CENTRAL STATES WALLSTATES WALLSTATES

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







## 21st Annual EDUCATION SEMINAR

April 19, 2016 | Monona Terrace, Madison

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- Student Design Competition
- GWS Problem Statement: Bahia Ballena, Costa Rica
- National Ingenuity Contest











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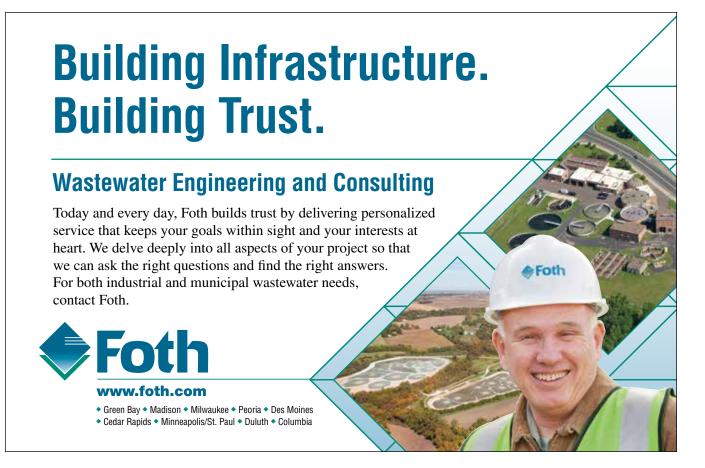
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#### **FEATURES**

21st Annual Education Seminar	II
2016 Student Design Competition	21
89th Annual Meeting Preview	39
Plant Profile: City of Kiel, Wisconsin	42
Regulatory Update	46
Conference on the Environment	49
Ingenuity Contest	52
Air Quality Permit Pitfalls, Resources	55





#### **DEPARTMENTS**

Messages

President's Message	7
WEF Delegates' Message	9
Executive Director's Message	17
Welcome New Members	60
Calendar of Events	61

#### CSWEA News WEFTEC Review:

Pershing Project	32
Welcome Reception	34
Operations Challenge	35
Student Design Competition	36

#### Section News

Illinois Chair Message	57
Minnesota Chair Message	58
Wisconsin Chair Message	59

Published by:





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Central States Water, the official magazine of the Central States Water Environment Association, Inc., is published four times per year. Send comments, news items, gloss photographs or digital images to Mohammed Haque, mbaque@eswea.org

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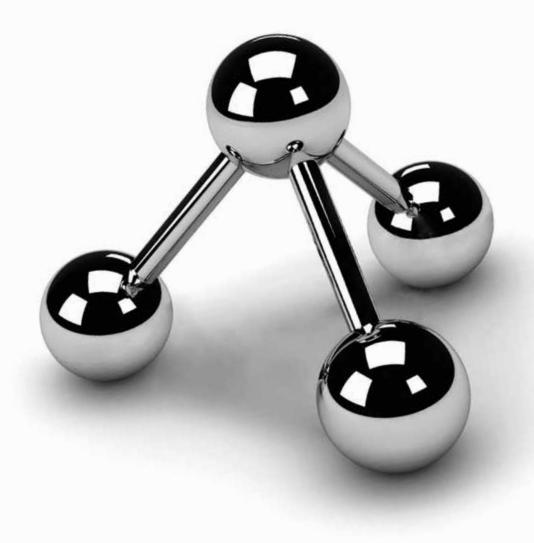
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## Occupation, Title, Job and Passion



By Keith Haas

s we prepare to file our 2015 tax returns, there is a spot where it asks for our occupation. I always put Civil Engineer, because that is my college degree, training, and background. My title at work is General Manager. My title at Central States is President. My job is running a multimillion-dollar water and wastewater facility for a population of over 100,000 residents in a pretty large city in the Midwest. Fortunately, none of these tasks are done alone, and I have competent people surrounding me. At any given time we can claim success or steer the ship on a proper course when we face a crosswind or current that requires us to make corrections.

Through our lives and our careers we meet people with a passion for a cause. Many of those that I have met at various conferences are truly passionate about wastewater science and treatment. When you listen to them tell of their woes at their treatment plant and how they handle day-to-day operations, you get an appreciation of just how committed and passionate they are about what they do every day. Those in academia are passionate about the study and the science of cutting-edge technology and research into new fields of treatment and measurement. The design engineers are excited to tell you what worked on at their past and present plant designs and modifications, and they are passionately looking for their next client so they can share their success stories with others. Plant managers and operators are passionate about how they operate their plants. They will defend their actions and remedies as the right way of doing things and convince you that they know that what they are doing is correct. Becoming an expert at any one of these facets of wastewater does not happen overnight. It comes with practice and experience, and good mentors to help us gain confidence in our careers. Before you know it we become the mentors and the new employees and designers need our mentoring skills.

On a more global horizon, several of our CSWEA members are passionate about bringing wastewater treatment to remote parts of the world. Life in metropolitan areas where we live and work becomes repetitive and mundane. The challenge of being able to start from scratch and apply the knowledge and skills that we have learned in a third world country is where the future leaders of our Central States membership are cutting their teeth and honing their skills. It is exciting to see the friendships and bonds that are being created across our three-state region because the young professionals have a cause to be passionate about. Historically, organizations concern themselves with getting clean water to remote parts of the globe. However, if you fail to provide treatment of the wastewater in these same communities you are failing to provide a sustainable community in which to live.

As our hair begins to turn various shades of gray and the retirement door is beginning to open for the senior members of our association, it is important to know that a new group of young professionals is preparing to take over the passion that so many of our members have experienced and called a career.

No matter where we live and work, people want assurance that their water is clean to drink and that we are properly treating and disposing of our waste. Because in many places in the world, source water for drinking water may be the same place we send our wastewater effluent. Keeping the effluent as clean as possible will fight off bacteria and dysentery that have challenged civilizations for centuries.

I can only imagine what our younger more passionate engineers might put as an occupation on their upcoming tax returns. Words like pioneer, innovator, entrepreneur or "World Wide Water Professional" come to mind. An occupation category of Civil Engineer seems rather insignificant when the world is your canvas and your ideas are the paint that creates a masterpiece and a better world to live in. G



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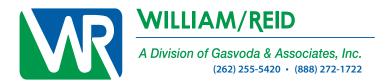


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## WEF House of Delegates Meeting at WEFTEC



By Eric Lecuyer and Doug Henrichsen

he WEF House of Delegates (HOD) held their annual meeting September 26, 2015 in Chicago during WEFTEC. CSWEA's WEF Delegates Eric Lecuyer and Doug Henrichsen both attended. In the morning, outgoing Speaker of the House Duyen Tran oversaw several reports, which included confirmation of the incoming WEF President, Board of Trustees, and new Delegates at Large. Presentations from the 2014-15 Standing Committees, which included the Budget, WEFMAX, and Steering Committees, was given by their respective chairs. A State of the Federation, which was followed by the Financial Report, was given during the Business Meeting by outgoing WEF President Ed McCormick. HOD members in attendance broke up into smaller groups to perform table top discussions to review the new Work Groups, which include Membership, Value of Water Campaign, Stormwater, and Innovative Utility Management.

In the afternoon, Standing Committees for the 2015-2016 term were established, as well as confirmation of the Speaker of the House (Jamie Eichenberger, Rocky Mountain WEA) and Speaker-Elect (Howard Carter, New England WEA). The HOD Standing Committees and Work Groups formed for 2015-2016 are:

House of Delegates Activities for 2015-16 Term		
Standing	Work Groups	
Committees		
Budget Committee	Membership	
Nominating Committee	Value of Water	
Steering Committee	Stormwater	
WEFMax Committee	Innovative Utility	
	Management	
Outreach Committee		

At the conclusion of the meeting, incoming WEF President, Paul Bowen, presented the vision for 2015-2016, which was followed by incoming Speaker of the House's, Jamie Eichenberger, call to action.

### WEF HOD STANDING COMMITTEES AND WORK GROUP UPDATE

For 2015-16, the WEF HOD Standing Committees and Work Groups were formed as presented above. Eric Lecuyer will serve a third term on the Budget Committee and will also serve on the Value of Water WG. Doug Henrichsen will also serve a second term on the Budget Committee, and will also serve on the Stormwater WG. Many of the Work Groups tasks are inward looking, how we can improve the House of Delegates, WEF, and better support MA's success and sustainability. For the Budget Committee, the primary task will be to report to the HOD on how WEF's annual budget aligns with the strategic plan and provide feedback to both the Board of Trustees and Member Associations on funding priorities. The Value of Water WG (and Water Advocates) will work with WEF staff and the BOTs on the Strategic Plan Critical Objective to "Increase the Awareness of the Value of Water". The Stormwater WG will reach out to MAs to identify which MAs have stormwater committees, their level of awareness of WEF national stormwater initiatives, identify barriers to creating MA-level stormwater committees, and identify other regional and national organizations that may be likely partners in expanding stormwater programs to

#### **WEFMAX 2016**

Four locations have been chosen to host WEFMAX in 2016. WEFMAX offers an opportunity for MA leaders at all levels to join together, share success stories and ideas on how MA members can be better served. These fast-paced, interactive meetings are open to all members and provide for both enlightenment and networking with other leaders of the water profession from throughout North America and beyond. The locations and dates are as follows:

- March 9-11, 2016: Orlando, FL (Host is Florida WEA)
- April 6-8, 2016: Philadelphia, PA (Host is Pennsylvania WEA)
- May 4-6, 2016: Chicago, IL (Host is Illinois WEA)
- May 18-20, 2016: Vail, CO (Host is Rocky Mountain WEA) (S

Detailed information on WEF's Governance, strategic plan and implementation of the plan is posted at www.CSWEA.org under the WEF Delegates Report.

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more members.



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## 21st Annual CSWEA EDUCATION SEMINAR

April 19, 2016 | Monona Terrace, Madison

## TREATMENT PLANTS OF THE FUTURE

Mark your calendars and budget for the CSWEA 21st Annual Education Seminar to be held on April 19, 2016 at Monona Terrace in Madison, WI. An exciting program focused on *Treatment Plants of the Future* will be featured with talks on energy, resource recovery, and planning. This is an excellent, affordable event to learn about issues and technical advances from national and local experts. In addition, attendees will earn approximately seven (7) professional development hours (PDHs) for professional engineers and operator's license requirements. Early registration will be open by February, and the registration cost will be \$200 for full registration, and \$30 for students.

Schedule		
Time	Speaker – Title	
8:00-8:10	Welcome	
8:10-8:45	Keynote Glen Daigger – Flexibility and Adaptability are the Essential Elements of the Water and Resource Recovery Facility of the Future	
8:45-9:20	Keynote Bruce Rittmann – Maximizing Microorganism-based Resources from Used Water	
9:20-9:40	Q&A	
9:40-10:00	Break	
10:00-10:30	Daniel Zitomer – Should Anaerobic Treatment Replace Activated Sludge?	
10:30-10:50	David St. Pierre – The Future is Now	
10:50-11:10	Kevin Shafer – So Really, Why Do We Strive to be a Utility of the Future	
11:10-11:30	Leisa Thompson – Engaging the Organization and Region in the Transformation to Utility of the Future	
11:30-12:00	Morning Q&A	
12:00-1:00	Lunch	
1:00-1:35	Glen Daigger – How We Can Use the Water We Produce	
1:35-2:10	Bruce Rittmann — Recovering the Lost P in Used Water	
2:10-2:20	Q&A	
2:20-2:40	Break	
2:40-3:10	Nick Menninga – Energy Sustainability at the Downers Grove Sanitary District	
3:10-3:40	Menachem Tabanpour – The Leading edge of Phosphorus Recovery: A Brushite Recovery Pilot	
3:40-4:10	Afternoon Q&A	
4:10-4:20	Closing Remarks	

## 21st Annual CSWEA EDUCATION SEMINAR TREATMENT PLANTS OF THE FUTURE

#### **Speakers and Topics**



#### Dr. Glen T. Daigger, Ph.D., P.E., BCEE, NAE

**Bio:** Dr. Daigger is currently Professor of Engineering Practice at the University of Michigan and President and Founder of One Water Solutions, LLC, a water engineering and innovation firm. He previously served as Senior Vice President and Chief Technology Officer for CH2M HILL where he was employed for

35 years, as well as Professor and Chair of Environmental Systems Engineering at Clemson University. Actively engaged in the water profession through major projects, and as author or co-author of more than 100 technical papers, four books, and several technical manuals, he contributes to significantly advance practice within the water profession. Deeply involved in professional activities, he is currently Immediate Past President of the International Water Association (IWA). The recipient of numerous awards, including the Kappe, Freese, and Feng lectures and the Harrison Prescott Eddy, Morgan, and the Gascoigne Awards, he is a Distinguished Member of the American Society of Civil Engineers (ASCE), a Distinguished Fellow of IWA, and a Fellow of the Water Environment Federation (WEF). A member of a number of professional societies, Dr. Daigger is also a member of the U.S. National Academy of Engineers.

#### **Keynote Presentation:**

Flexibility and Adaptability are the Essential Elements of the Water and Resource Recovery Facility of the Future

Water Resource Recovery Facilities (WRRF's) must comply with treatment objectives and product water quality requirements which evolve over time, and adapt to and incorporate evolving technologies. The useful life of the physical structures is significantly longer than that of the specific technologies used. Thus, the WRRF of the future must, first and foremost, be designed with the flexibility to adapt to a wide variety of requirements over its life, using a wide variety of technologies, some of which are currently known and some which will be invented and/or further developed over time. One might say that this, rather than the specific technology implemented, is the true essence of the WRRF of the future. While incorporating flexibility and adaptability into facilities may seem like a daunting task, especially with future requirements and technologies largely unknown, practical experience indicates that much can be done to prepare for future transitions. Approaches proven in engineering practice will be presented.

#### **Second Presentation:**

#### How We Can Use the Water We Produce

Water is the most valuable product produced in a Water Resource Recovery Facility (WRRF). Uses can range from environmental enhancement and restoration, up to the production of potable water. In all cases, the concept of "fit for purpose" water, meeting product water requirement for specific uses, represents the evolving paradigm. Thus, it is necessary to understand the range of uses that WRRF product water can be put to, and the associated quality requirements and treatment approaches.



#### Dr. Bruce Rittmann, Ph.D, NAE

**Bio:** Dr. Bruce E. Rittmann is Regents' Professor of Environmental Engineering and Director of the Swette Center for Environmental Biotechnology in the Biodesign Institute at Arizona State University. Dr. Rittmann is a member of the National Academy of Engineering; a Fellow of the American Association for the Advancement of Sciences, the Water Environment Federation, and the International Water Association;

and a Distinguished Member of ASCE. Together with Dr. Perry McCarty, Dr. Rittmann authored the textbook *Environmental Biotechnology: Principles and Applications*.

#### **Keynote Presentation:**

Maximizing Microorganism-based Resources from Used Water. While wastewater treatment has focused on removing water pollutants, many of the pollutants are valuable resources if recovered in a useful form. This presentation focuses on novel means to capture the energy value in "used waters," including domestic wastewater. New developments in anaerobic membrane biofilm reactors (to generate methane) and microbial electrochemical cells (to generate electrical power or hydrogen gas) now make it feasible to achieve energy-positive treatment of the BOD, while releasing inorganic N and P in forms that can be recovered as "mobile nutrients," the topic of Dr. Rittmann's afternoon paper. This talk will introduce the new technologies and offer insights into their pros and cons.

#### **Second Presentation:**

Recovering the Lost P in Used Water. After recovery of the energy from used water (Dr. Rittmann's morning talk), most of the N and P are released as inorganic forms that can be recovered for recycle to agriculture. This talk will focus on P recovery, although many of the principle also apply for N.



An important take-home lesson is that traditional techniques for "P removal" will not work for P recovery. P-recovery techniques that produce a product useful in agriculture include precipitation as struvite or hydroxyapatite and selective sorption to Fe-based sorbents. Each approach is described, and the relative pros and cons are discussed.



#### **Dr. Daniel Zitomer**

**Bio:** Professor of Civil, Construction and Environmental Engineering and director of the Water Quality Center at Marquette University, Zitomer specializes in wastewater treatment and anaerobic biotechnology. He has more than 20 years of experience consulting with entities such as Brown and Caldwell, United Water Services, Symbiont, and others. Zitomer has

authored more than 60 journal articles, proceedings papers and technical reports. He received the 2008 Gordon Maskew Fair Distinguished Engineering Educator Medal from the Water Environment Federation for outstanding service in engineering education. He presently teaches graduate classes on anaerobic biotechnology, biological wastewater treatment and environmental chemistry, and has performed research for the National Science Foundation, Milwaukee Metropolitan Sewerage District, State of Wisconsin and others. Dan Zitomer will discuss using anaerobic membrane bioreactors to treat primary clarifier effluent at low temperatures.

#### Should Anaerobic Treatment Replace Activated Sludge?

The activated sludge process is a time-tested, dependable method to remove BOD5, nitrogen and phosphorus. However, descriptions of more sustainable processes of the future often show anaerobic bioprocesses in place of activated sludge. This is because activated sludge often involves a high-energy demand for aeration and high biosolids production rate. In contrast, anaerobic processes are described as net energy positive since biogas can be used as fuel, aeration is eliminated, and biosolids production is reduced by approximately 90%. But anaerobic treatment does not remove appreciable nitrogen and phosphorus and is considered inappropriate when effluent BOD must be consistently below 30 mg/L or less. Can anaerobic processes really replace activated sludge? Is anaerobic mainstream treatment a net energy producer? In this talk, benefits and challenges regarding anaerobic bioprocesses for mainstream municipal wastewater treatment will be discussed. Results from a two-year R&D project will be presented.



#### **David St. Pierre**

**Bio:** David St. Pierre is the Executive Director of the Metropolitan Water Reclamation District of Greater Chicago where he manages a staff of nearly 2,000. The District covers 883 square miles and provides wholesale wastewater treatment for over five million residents in Cook County, Illinois. The District operates seven wastewater treatment plants

which treat one billion gallons/day. The District also provides regional stormwater services. The District has been a leader in the industry since its creation in 1889, and David is committed to ensuring this rich tradition of leadership continues under his tenure. Among other tasks, the District is leading efforts among utilities in adopting a resource recovery model. David has been committed to excellent service and fiscal responsibility throughout his 30-year career in the water industry.

#### The Future is Now

It is an exciting time to work in the water utility business. The recent "Utility of the Future" publication outlines an idea that utilities will transform into resource recovery facilities. This idea is a seed that is beginning to take root throughout the country. What utilities grow into remains to be seen. Chicago is exploring many opportunities. The MWRD's strategic plan outlines goals to become energy neutral by 2023, recover phosphorus, provide reuse water and distribute biosolids on a much larger scale – all with a return on investment. These tried and true technologies will provide annual revenue streams ranging from \$50 million to \$75 million a year. Receiving state statute authority to harvest and resell recoverable resources has opened the door to entering the future. Newer technologies will provide even greater opportunities. An exciting algae growth accelerator has the potential to remove nutrients to a very low level while providing a return on investment that can aide in needed capital investments. This new horizon is growing and needs to be explored. Opening up the power of possibility is allowing water facilities to grow into sustainable processes. What does this future ultimately hold? Come explore the future for the future is now.

Join us for the Speaker Reception April 18, 2016 | 5:30-7:00 p.m. Monona Terrace

## 21st Annual CSWEA EDUCATION SEMINAR TREATMENT PLANTS OF THE FUTURE



#### **Kevin Shafer**

**Bio:** Kevin Shafer is the Executive Director of the Milwaukee Metropolitan Sewerage District (MMSD) and is responsible for the overall management, administration, leadership and direction for MMSD in meeting short- and long-term goals and objectives; coordinates the establishment of strategic goals and objectives and their approval by the Commission; oversees the development of policies and operating

plans; and represents MMSD to its customers, bond rating agencies, and the public. Prior to joining the District, Shafer spent 10 years in private industry with an international engineering firm in Chicago and Milwaukee, and six years with the U.S. Army Corps of Engineers in Fort Worth, Texas. He holds a bachelor's degree in science and civil engineering with a specialty in water resources from the University of Illinois and a master's in science and civil engineering from the University of Texas. He is a past president of the National Association of Clean Water Agencies and the Chair of the US Water Alliance's Urban Water Sustainability Leadership Council. He currently serves on the EPA's Local Government Advisory Committee and is the Chair of the Water Environment Research Foundation (WERF) Board of Directors.

#### So Really, Why Do We Strive To Be a Utility of the Future?

In our industry, there are many buzz words that come and go. Some may think that "Utility of the Future" (UOTF) is just another one of these. I argue that it is not. Water utilities around the country are faced with shrinking revenues, rising costs, challenging regulatory approaches, and inflated customer expectations. UOTF is a set of initiatives that outlines approaches for the water industry that brings together the principles of "One Water" with our daily operational strategies. Many strategies are common sense, but linking them into unified approaches makes the roadmap toward a UOTF not only logical, but necessary.



#### **Leisa Thompson**

**Bio:** Leisa Thompson is the General Manager of Environmental Services, a division of the Metropolitan Council (MCES). MCES' vision is to be a valued leader and partner in water sustainability with a mission to provide wastewater services and integrated planning to ensure sustainable water quality and water supply for the region. MCES operates and maintains

approximately 600 miles of sewer that collects wastewater flow from more than 5,000 miles of sewers owned by 108 communities and treats 250 million gallons per day at its eight wastewater treatment facilities. Leisa joined MCES as the laboratory manager in the eighties. She has an MBA from St. Thomas University and a Bachelor of Science in medical technology from Winona State University.

### Engaging the Organization and Region in the Transformation to Utility of the Future

The Twin Cities metropolitan area, a region of nearly 3 million people, is anchored by three great rivers and dotted by hundreds of lakes. In 2015, the regional planning agency, Metropolitan Council, wrapped up two years of high public engagement and adopted a 25-year vision called Thrive MSP 2040. The plan for our next 30 years identifies key challenges: constrained fiscal resources, new demands stemming from demographic shifts, emerging environmental challenges, new regional planning priorities, and the increasing necessity of regional economic cooperation. Leisa Thompson will share how the Environmental Services division responded by developing a new organizational vision in 2014 followed by regional water plans in 2015 establishing a path forward to address the emerging environmental challenges and achieve the outcomes and principles of the regional vision.







#### **Nick Menninga**

**Bio:** Nick has been pursuing energy cost reduction measures since taking the General Manager position at DGSD in 2007. He is a registered professional engineer and a class 1 certified wastewater treatment plant operator in Illinois, with over 30 years of experience in the wastewater field. He chairs the Illinois Association of Wastewater Agencies' Energy

Technical Subcommittee.

### Energy Sustainability at the Downers Grove Sanitary District

The Downers Grove Sanitary District has invested significant resources to improve its energy sustainability and independence from outside energy sources. The District has improved its energy efficiency with a number of equipment investments, including a state-of-the-art highly efficient aeration system (fine bubble diffusers and high speed turboblowers), HVAC equipment that uses digester gas and effluent water to significantly reduce the energy required to operate, energy efficient lighting, strategic VFDs for pump modulation, and control system improvements that allow optimum operation. In addition, the District is investing in energy generation equipment with plans to meet remaining energy needs by generating electricity with available resources. The District has installed a combined heat and power facility that converts digester gas into electricity and digester heat. The first phase of the facility has been operational for a year, with plans for a second generating unit in process. Digester gas production is enhanced by receiving and co-digesting hauled high-strength waste that is generated locally, reducing hauling and disposal costs for customers who generate compatible high strength waste streams.



#### **Menachem Tabanpour**

**Bio:** Menachem is the President and Co-Founder of Nutrient Recovery and Upcycling, LLC. NRU specializes in imagining, researching, and developing systems that recover and upcycle low-grade resources into high value products. Their primary areas of research are phosphorus and ammonia recovery. After

receiving his undergraduate degree from University of Wisconsin – Madison, he went on to do many years of research in the Barak Lab. Menachem's enthusiasm for innovative technologies and his knowledge of nutrient harvesting make him an asset to our program.

### The Leading Edge of Phosphorus Recovery: a Brushite Recovery Pilot

Nutrient Recovery & Upcycling, LLC has built the next generation of phosphorus recovery with a pilot that recovers a valuable fertilizer mineral called brushite from anaerobic acid digesters. Our technology demonstrates the ability of acid phase digesters to release phosphorus that can be recovered by our process leading to higher total phosphorus recovery rates at the optimal location to prevent struvite buildup.

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For more info, contact Mike Holland
mholland@dekalbsd.com

## See you in Madison April 19, 2016







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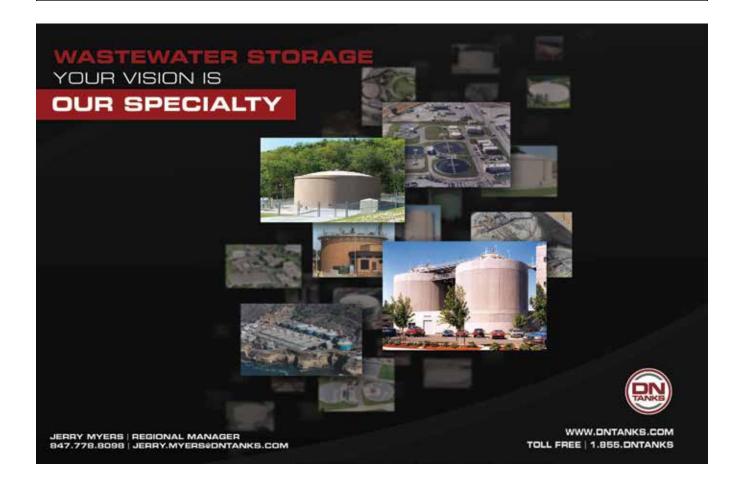
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## Careers with Passion Rooted in Purpose

By Mohammed Haque

n the last edition of Central States Water, you likely saw that we lost a great supporter and Past President of Central States. Larry Breimhurst received many accolades throughout his career including the prestigious Radebaugh and Bedell Awards.

Aside from being our President from 1980-1981, his greatest service to our organization was that of the Influent Integrator. Through that role, he had the privilege of grilling many members prior to receiving the honor of becoming a member of the 7S Society.

The Sentral States Select Society of Sanitary Sludge Shovelers is very special to CSWEA and our industry. The shovel is presented to those members that have given their time and effort to CSWEA and show that special passion for our unique



Larry Breimhurst

industry. They understand the purpose and the importance of our careers.

Amy, Zaid (my voungest son) and I had the honor of sitting with

Larry and his wife at the association luncheon in Oakbrook Terrace on May 20, 2015. We all watched Jim Shaw initiate the latest batch of 7S inductees. Jim made the extra nice move of

acknowledging that Larry was in our presence. Larry had made the long trek from Minnesota to attend the Annual Meeting. Little did we know it would be his last. We feel honored to have spent that luncheon with him and thank his family for the support they gave him so that he could be passionate in his



Tom Bunker

career and in his service to CSWEA.

Later that evening at the awards banquet, I bumped into Tom Bunker, our most recent past Influent Integrator as well

as Past President from 1994-1995. Tom is just a great jovial guy, a character quality that is mandatory for the highly sought after Influent Integrator position. We chatted for a while and he told me about some of the history of CSWEA



that I did not know. While he was talking, I was marveling at the lapel pin that he had on.

The pin was for the Central States Water Pollution Control Association, our previous organizational name. I told him how I had never seen that pin in the 18 years that I have been part of the organization. Tom took the pin off and gave it to me. It was a very touching gesture and one that I will not forget. Thanks, Tom!

A couple months after the Annual Meeting, I got an email from Paul Kuhn, President 1975-1976. Paul has been a member of CSWEA and WEF since 1953. He had lunch earlier that day with Russ Susag (CSWEA President 1974-1975) and another CSWEA member, Jerry Allen. They were talking about the passing of Larry Breimhurst and exchanged the latest issue of our magazine amonast themselves. During our email exchange, Paul told me about how he was recruited into CSWEA by a predecessor of mine, Paul Troemper when he was studying engineering at the University of Illinois Urbana Champaign in 1953. He reminded me of the incorporation of WEF in Illinois and I recalled that CSWEA was one of the founding members of WEF (called the Federation of Sewage Works Associations) in 1928.

Paul had something more to say that was really impactful. He read the magazine and was impressed with what we



**GLOBAL WATER** 

were doing through the Global Water Stewardship in Costa Rica. He told me to keep it up. Those words of encouragement meant so much from a gentleman who has known our industry for the last 62 years. I felt that we had

"For the first generation of CSWEA members, that purpose was cleaning up toxic rivers and lakes."

### "My generation has had the tough job of making things even better."

spanned three generations in the exchange of those few emails.

Later, as I recollected on that exchange, it dawned on me. Careers with passion cannot exist without purpose. For the first generation of CSWEA members, that purpose was cleaning up toxic rivers and lakes. With the Clean Water Act, it was real, measurable and the results were visible. And so for that first generation, they had a purpose and it was to build treatment plants that would prevent pollution from reaching our waterways. They accomplished this well and we now enjoy the results of their efforts. We have healthier

lives, live longer, and have a plethora of recreational waterways.

My generation has had the tough job of making things even better. We have dealt with increased regulations, lower permit limits and become polishers of the waters that we discharge into our waterways. We are now also looking at ways to recover resources from our waste streams. We are generating power from waste, finding alternative uses for our effluent through reuse and becoming energy neutral. One of our biggest accomplishments will be to solve the downstream effects of nutrients and to work on solutions that are holistic

and involve communities and partners such as farmers and industrial users. However, our purpose can sometimes be hard to visualize, the net effect, difficult to measure. So that is why some of us, including me, look to do more through global efforts.

The next generation knows the power of their careers and is fearless when it comes to making an impact. I'm impressed with their determination and methodology. They have perseverance that I have not seen in our generation, and their purpose reaches way beyond the borders of the US. I am fortunate to be working with many of them on the Global Water Stewardship as well as through our Student Design Competition. They know that through their careers, they can make lasting impacts on societies and communities way beyond the ones they are employed by. They are a generation that will make an impact in the world and use their careers to solve the issue of 2.4 billion people not having access to proper sanitation. They will solve the problems of 32% of the world's population.

I am glad to have built my career on the hard work of the generation before me and even happier to provide the tools and resources for the next generation to make a lasting impact on the world's sanitation's needs. We are all lucky to have careers with passion that are rooted in purpose. (S

"The next generation knows the power of their careers and is fearless when it comes to making an impact."





## SENTRAL STATES SELECT SLUDGE SHOVELERS TWO SSSSSSSTEPSSSSSS AHEAD



The Central States WEA has the only WEF Select Sludge Shovelers group that is not a member of the 5-Sers. Their sludge shovelers are called 7-Sers as derived from "Sentral States Select Society of Sanitary Sludge Shovelers". This sertainly sincerely says something super substationally special about their chovelers (sssssssorry about that — had a left over "c" that needed to go somewhere).

The Central States Chapter of the Select Society of Sanitary Sludge Shovelers was founded in June 1971. Selection to the Society is in recognition of "outstanding meritorious service above the call of duty" to the Central States Water Environment Association, Recent tradition dictates that the members of the Society each vote for nominees from their state prior to the Annual Meeting, and then formally select the new members at the Annual Meeting held each May. Not more than two new members may be selected from each state (Illinois, Minnesota, Wisconsin) each year. An honorary member is usually inducted each year also. The honorary member is usually the WEF representative at the Meeting.

The "Influent Integrator" appoints a state representative for each state. The state representative distributes a ballot of nominees with a brief



Larry Breimhurst at the helm in 1997.

The Central States WEA has the only WEF Select Sludge Shovelers group that is not a member of the 5-Sers. Their sludge shovelers are called 7-Sers.

biography to the members in that state, usually in March preceding the Annual Meeting. The Influent Integrator tallies the votes from each state, and prepares the certificates for signatures by 7-S members at the member meeting held on the day before the Business Luncheon. The Influent Integrator signs as neutral "pH 7", and 12 other members sign for the remaining pH's 1 through 6 and 8 through 13. The certificates and gold shovels are presented during a "dignified" ceremony at the Business luncheon. The new Shovelers are surprised as their selection is kept secret until the luncheon. Many shady techniques have been used to lure some of the new members to the luncheon.

At the induction ceremony, a brief explanation of the 7-S Society is given and the new members are asked to come forward to be introduced. They are then individually asked to rapidly repeat three times "Sentral States Select Society of Sanitary Sludge Shovelers."

Various levels of "tongue-incheek" and "tongue tiedness" spontaneously erupt, much to the delight of the luncheon attendees. If this meets the satisfaction of the other members present, they are awarded the certificate and shovel. The ceremony is fun, and it is up to the Influent Integrator to alter as desired.

There are no dues, rules or officers, except the Influent Integrator who is designated neutral "pH7."

The Integrator is (s)elected by the 7-S members and serves until a successor is (s)elected and installed. The duties are to record and report selections, present official certificates of elevation, bestow badges and inform chapter members concerning the Society. A "perk" of membership is the privilege of cleaning up before, during and after meetings of the Association.

The 7-S badge is a gold shovel with "CSWEA" embossed on the handle and 7 separate "S's" embossed on the shovel blade. The password is derived from the letters of the name and is pronounced "s-s-s-s-s-s."

Frank Vilen served as the original Influent Integrator from 1971-1972 followed by Bill Conrad from Milwaukee, WI from 1973-1983, Larry Breimhurst from St. Paul, MN from 1984-1997, Tom Bunker from Racine, WI. from 1998-2005 and current Influent Integrator Jim Shaw from Mequon, WI.

Central States has historically been very active in the Federation, and Seven-S members have followed suit. William D. Hatfield, George J. Schroepfer and Richard S. Engelbrecht (all founding 7-S members) served terms as President of the Federation.

Lanny Breimhunst Influent Integrator, 1997



Tom Bunker and Jim Shaw at the 78th Annual Meeting in 2005.



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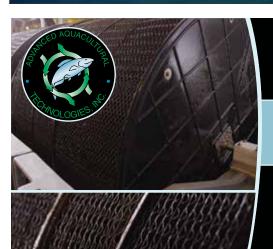






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## The Central States Water Environment Association Student Design Competition

October 7, 2015

#### Greetings,

I would like to introduce you to the Student Design Competition sponsored by the Central States Water Environment Association (CSWEA). This year, the CSWEA competition will be held on the afternoon of **Monday, April 18, 2016**, the day before the CSWEA Education Seminar at Monona Terrace Convention Center in Madison, WI. This is a great opportunity to participate in the competitions and attend the Education Seminar the following day.

The Student Design Competition is described in detail on the following pages. There are three different competitions in the Design Competition; Wastewater Design, Environmental Design, and Global Water Stewardship Project. 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. 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 24-28, 2016 in New Orleans, Louisiana.

The Student Design Competition is designed to be a function of the WEF Student Chapters program. We understand that you may not have a WEF Student Chapter at the present time. A Student Chapter is not required to compete for CSWEA. WEF requires students to have a WEF student membership to participate at WEFTEC; however, CSWEA does not require it to participate in either of these two events at the Member Association level. CSWEA will provide student membership enrollment in WEF for teams/individuals who represent CSWEA at WEFTEC.

The State Sections (Wisconsin, Illinois and Minnesota) of CSWEA have budgeted funds to assist individuals or teams from their State to present at the CSWEA competition event in April. We understand it is hard to schedule students to participate and will be as flexible as possible in working with you and your students to afford the opportunity to participate on April 18. 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 announcement and provide this information to any of your full-time 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 either of these two events. I can be contacted by phone at 815-762-5919 or email at mholland@dekalbsd.com.

Best regards, Mike Holland CSWEA Student Committee Chair

## 2016 CSWEA & WEF Student Design Competition

## Rules of the Competition

**INTRODUCTION:** The 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 three levels of competition: a conventional Wastewater Design category which includes traditional wastewater design projects, an Environmental Design category which would include contemporary engineering design topics like sustainability, water reuse, wetland construction, and Engineers Without Borders projects and the Global Water Stewardship category which would use the problem statement titled Global Water Stewardship: Bahia Ballena, Costa Rica.

Detailed 2016 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 criterion 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 competitions. 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. 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 April 1:** Submittal of the entry form for the 2016 Student Design Competition is due on April 1. Submit to Mike Holland at mholland@dekalbsd.com.

**TIMELINE**: April 18: CSWEA Design Competition will be held at the Monona Terrace, Madison, WI.

May 17-20: The winning team from the CSWEA Competition will be invited to present at the CSWEA Annual Meeting in Madison, Wisconsin.

September 24-28, 2016: The winning teams from the CSWEA Competition will be offered the opportunity to compete at WEFTEC-2016 in New Orleans, Louisiana.

PRESENTATION: The student design teams will present their projects at the Design Competition on Monday afternoon April 18 prior to the CSWEA Education Seminar in Monona Terrace; Madison, WI.

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

NOTIFICATION: The winning team will be notified during the CSWEA Education Seminar on April 19 or immediately following.

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 (max. of 4 members) from each category of the CSWEA competition will receive free registration from WEF and travel and lodging expenses paid by CSWEA to compete at the WEFTEC conference in New Orleans, Louisiana (September 24-28, 2016).

Additionally, the winning team from the Global Water Stewardship category will also receive travel and lodging funding to accompany the next CSWEA team trip to Costa Rica for site analysis and investigations.

Prizes for the winning team at WEFTEC will vary depending on sponsorship opportunities. Monetary awards typically provided by WEF for the top 4 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 Committee Chair (Illinois) 815-762-5919

mholland@dekalbsd.com

Bryan Viitala, CSWEA Student Committee (Wisconsin) 262-241-1199

bviitala@mulcahyshaw.com

Ashley Hammerbeck, CSWEA Student Committee Chair (Minnesota) 651-659-7717

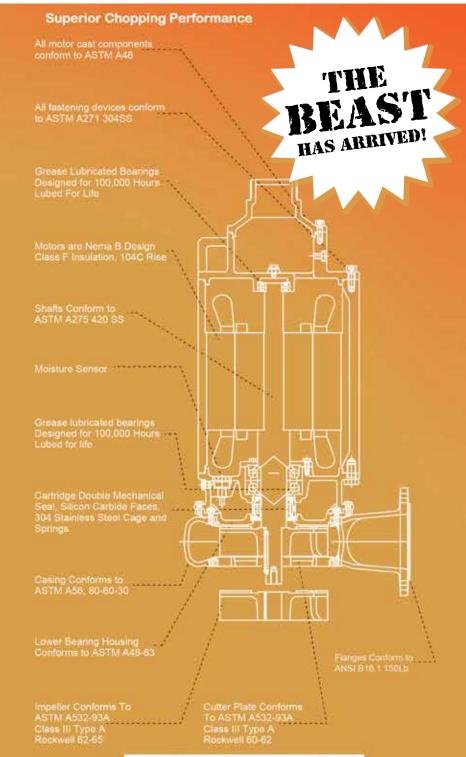
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## Global Water Stewardship: Bahia Ballena, Costa Rica September 2015 Problem Statement



#### **Project Understanding**

Location: Bahia Ballena, Costa Rica

Population: 1,000 currently with expected growth to 3-4,000 in 10 years

Number of homes: 188; Approximately 3-4 people per home Number of non-residential (lodges, restaurants, school, etc.): 25

Water usage: Design = 200 L/person/day; Actual: 2,000 - 3,000 cubic meters/month

Average Precipitation: 3,900 mm/yr

Average Temperature: 79 degrees Fahrenheit

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. Although law states the leach fields must stay within each individual property, they often do not. Also, the groundwater table is often high, which does not allow for the proper detention of the leachate. The groundwater table in the area varies depending on the tide. In the tourist areas with higher populations, holding tanks are used along with trucking to a treatment system.

The area of concern is a specific dense portion of Bahia Ballena, Costa Rica. Bahia Ballena is a community in the southern part of Costa Rica, directly located off the Pacific Ocean, and is a tourist community. The community consists of restaurants, homes, and tourist businesses that utilize the ocean with whale watching, boat tours, surfing, and other marine activities. Most of the community is focused around the visitation of tourists who pay to eat, lodge, and visit the federally protected marine park. The main source of employment is the tourist industry.



#### Global Water Stewardship: Bahia Ballena, Costa Rica

The community is still growing with several larger developments currently planned to be built. There is a desire that these future developments would be connected to a sanitary system, however, they are not scheduled to be at this time. There is no curb and gutter, yet a good portion of the community has paved roads. Many of the homes along the paved roads are lower than the paved roads. The stormwater flows through open ditches, into the local estuary, and eventually to the Pacific Ocean.

The community consists of a mixture of homes and businesses, with the businesses being located in a denser area closer to the marine park. The homes and businesses all vary in size and setup, with some having individual septic tanks for greywater and sanitary, while some only have a sanitary septic tank. Most businesses do have both. All of the septic tanks in the community were poured in place with no standard sizing, location, or plumbing being used. However, it is Costa Rican law that the

property owner is responsible for their individual connection to the sewer main, so only a stub to the property would need to be provided. It is also Costa Rican law that once a sewer main is constructed in front of a property, the property owner has to pay for the service whether they connect to it or not.

Aerial photos were taken in August, 2015 and show the locations of the businesses and homes.

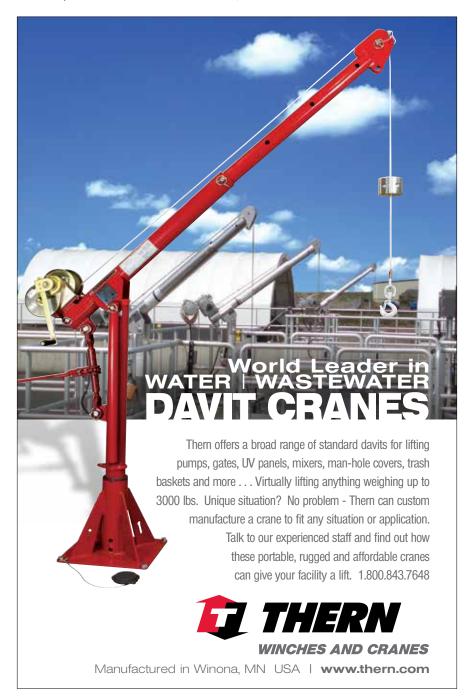
The septic tanks are concrete or plastic structures, however they are not sized or designed for specific conditions, and they are poured in place and put into use. The use of plastic for septic tanks is much cheaper than concrete. However, the plastic ones break more frequently due to the change in pressure from pumping the septic tanks. The homeowners are responsible for pumping their septic tanks, and are legally obligated to do so, but there is no control to ensure they do. The charge of the clean-out service is around \$75 per home, and should occur twice a year. Businesses pump about 1-2 times a month, and pay around \$200 each time.

Some minor monitoring of the local streams and estuaries will be performed by other charitable organizations using water sampling kits brought down by the GWS group. The results of the sampling will be able to be obtained at a later date, if desired.

In Costa Rica 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. Toilet paper is disposed of along with the other solid waste. A lot of refuse in rural areas is burned.

#### **Treatment Site Location**

There are a number of potential sites that were scouted that could be used for a centralized wastewater treatment location. The first location is an old air strip that is no longer being used. This was originally thought to be the best location since it is owned by the government, but there are future plans already in place. However, the northern portion of the air strip could potentially be used and still likely the best option due to land ownership. The second potential location is a property for sale that is located near the southeast



portion of the project area. The major obstacle with this property would be the purchasing of it, and that we only need a small portion.

The third and most ideal location would be to the south of a proposed subdivision located at the very eastern part of the project area. This area was discussed at a meeting with local government leaders and was thought to be the most suitable. The government leaders mentioned they could potentially gain ownership of the property from the land developer in exchange for supplying the proposed subdivision with potable water. These discussions with the landowner have begun. All of the locations would likely need to be pumped to from the low point in the collection system.

The project would most likely be broken down into two phases for implementation. The first phase would consist of constructing a collection system in an area that is mostly business, denser in development, and is closest to the ocean and National Marine Park primary tourist entrance. The centralized treatment system would also be constructed during this phase. The second phase would consist of a mix of residential and business, and is less dense. These areas are shown in other materials to be provided.

Consideration needs to be given for expansion of the treatment facility and capacity in the sewer system to accommodate the significant growth that the area is expected to see in the reasonably near future. Due to the location of the property and readily available flat land, this area is likely to see the growth that is projected.

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

- The location of the treatment facility needs to be adequately sized for anticipated flow, future growth, with rainfall taken into account.
- The treatment facility needs to be able to handle "shock" loads since festivals and tourist seasons can bring high fluctuations in population, with flows that can peak to 30-50% greater than average monthly flows. This occurs in about five months in a given year.

www.cswea.org

- Treatment facility should be designed to be able to treat to a level of 30 mg/L BOD and 30 mg/L TSS.
- The location of the treatment facility needs to be easily attainable and be able to have sewers flow to it, or be pumped in an efficient manner.
- Houses and businesses are often 5' or lower from the roadway, so collection system installation may be more ideal in rear lots. Law does require properties lower than the street to install a pump to the ditch, and the pump would be paid for by the property owner. The easier and cheaper it is to connect, the more favorable it will be to property owners.
- Polyethylene pipe has been recommended for construction, because of ground shifting, however, this should be verified during design.
- The septic tank leach fields are very small and shallow. The native soils are not conducive to treatment through a leach field.
- Some grey water is routed over the yards and into drainage ditches.

#### **Project Approach**

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

#### **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 level of long-term success.

- The project must take in to consideration the local weather and heavy rainfall.
- The equipment must have a high level of reliability. Resources are not available for many equipment breakdowns.
- The equipment must have a level of redundancy to maintain treatment if some equipment is in temporary disrepair.
- The solution must have a low operation and maintenance cost

- due to the residents' limited income. Special consideration will be given to designs that are energy efficient and/ or partially self-sustaining from an energy standpoint.
- The project capital cost must be low due to limited funding.
- The project 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 only be able to operate the system part time, so the system should be fairly self-operational.
- The wastewater treatment equipment must be easily replaceable with parts readily accessible.
- Treatment equipment would presumably be compatible with the existing electrical system.
- Consider simplicity (less O&M the better) in design whenever possible.

#### **Design Basis**

Each submittal shall include a summary of the following items as needed for the project:

- What should be the pipe size, depths and slopes?
- With houses being located lower than the roadway, where is the most feasible location for a potential collection system (under roadway, rear yards, etc.)?
- How should the collection system convey flow to the centralized treatment facility?
- What pipe bedding and cover should be used?
- What manhole spacing should be used?
- What design should be used for the centralized treatment facility? What would be the required footprint and depth of this facility?
- What degree of expandability should be built into the design? Would this be acceptable by the village?
- How much would this help with the ongoing operation and maintenance costs? What will be the design year? What will be the design average daily flow and peak hour flow?
- What type of odor control should there be, if any?

Click HERE to return to Table of Contents Winter 2015 | CSWEA 27



#### GLOBAL WATER Global Water Stewardship: Bahia Ballena, Costa Rica

"Teams are encouraged to use credible sources for additional information needed to complete their designs. Coordination with an academic advisor and/or water treatment professional(s) is highly encouraged."

- Should the equipment be provided through a US equipment supplier or a Costa Rican equipment supplier?
- Should back-up power provisions be made in the design since power outages happen frequently? If not, should a holding tank be included at the treatment system to store water during times of power outage?
- What Supervisory Control and Data Acquisition (SCADA) systems, if any, should be at the treatment system? Should the SCADA system be operational-based or monitoring-based?
- What is the maximum level of water in the discharging waters?
   What will the hydraulic grade line

- be for the rest of the treatment system and collection system?
- Would the electrical utilities have to be upgraded (e.g., higher amperage rating) for the treatment system?
- Develop a realistic project timeline with critical milestones.
- Consider maintenance requirements that may involve temporarily taking certain systems out of operation in the design and how to account for demand during maintenance.

### **Develop Engineer's Opinion** of the Cost of Construction

Develop an Operations and Maintenance forecast for 10 and 20 year timelines.

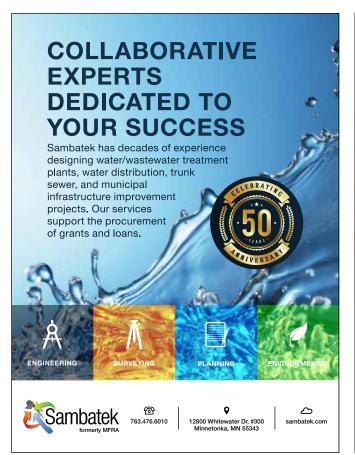
#### **Reference Information**

Information obtained by CSWEA on the Bahia Ballena project has been saved here for your use: http://cswea.org/SYP/Competition.

Teams are encouraged to use credible sources for additional information needed to complete their designs. Coordination with an academic advisor and/or water treatment professional(s) is highly encouraged.

Refer to the WEF and CSWEA websites or contacts for the latest design competition guidelines: https://www.dropbox.com/sh/f7h0kiaxkef5zbi/AACJXsDuUeOn\_QqDt4pQRpeva?dl=0. If the posted guidelines are outdated, teams are advised to use the previous year's guidelines. Deadlines will be similar to years previous, but interested teams should contact their CSWEA student representative for more information.





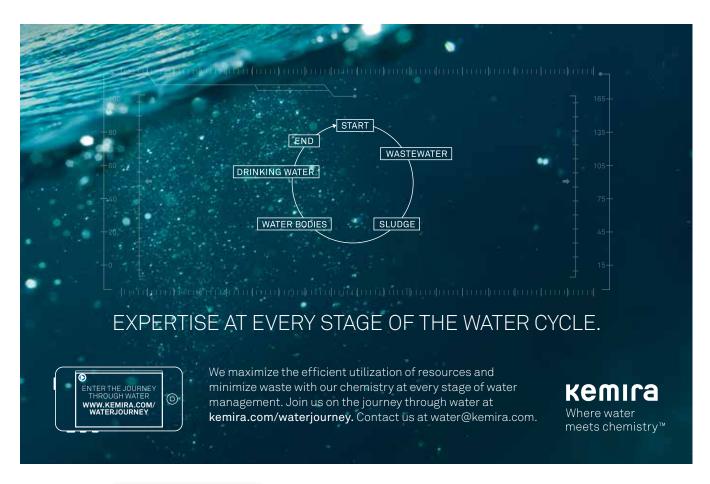
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## **INOGO Newsletter**

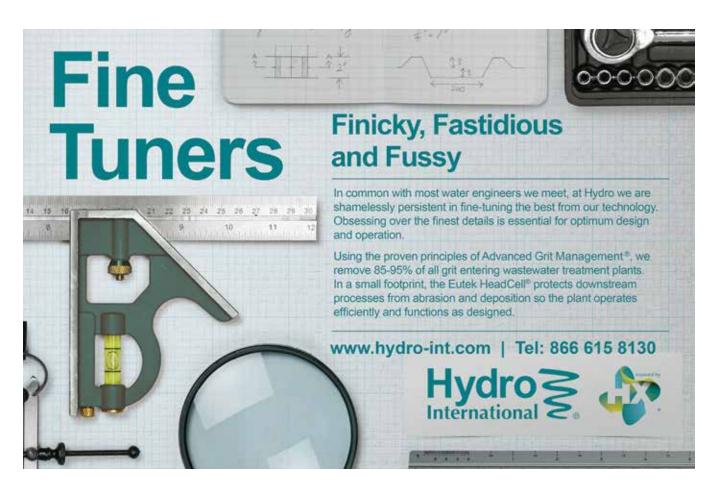
## Features Collaboration with CSWEA

This past August members of both CSWEA and INOGO met with key stakeholders in Costa Rica to discuss design plans for wastewater treatment in Piedras Blancas on the Osa peninsula. To spread the word about the project and solicit donations and support, INOGO published a story in its September newsletter on the project, how it will look, and what it will accomplish for the local population. Thanks to stories like these, awareness and support of our efforts to create sustainable water quality throughout the world can grow more quickly.

INOGO is a program of the Stanford Woods Institute for the Environment (Stanford University). Its goal is to generate a living process for sustainable development led by local communities, businesses and government organizations in Costa Rica's Osa and Golfito regions. The story can be found at: http://stanford.io/1RwsyfR CS







## 2015 WEF Community Service Project

By Chris Marschinke

The 8th annual WEF community service project kicked off yet another record-setting WEFTEC Conference. Organized by the Students & Young Professionals Committee (SYPC), this year's service project saw the largest group of volunteers to date. Over 130 WEF members and community participants donated their time and energy to the annual project, including a number of Central States WEA members. Funded entirely by sponsorships and donations, the project seeks to leave a positive and lasting effect on the WEFTEC host city.

The SYPC Community Service Project Subcommittee begins planning for each project over a year in advance. While the projects typically revolve around green infrastructure improvements, criteria have been developed to select the project with the greatest potential impact each year. Factors such as community involvement, maintenance requirements, and opportunities for educational elements all guide the subcommittee's selection process. Once a project has been selected, the design team begins conceptual layout of the proposed improvements, often in partnership with local engineering or landscape firms. The budget and marketing teams determine the funding requirements to accomplish the objectives, and secure sponsors and donors to make the project a reality. Finally, the logistics team coordinates all vendors and day-of requirements, while trying to maintain some semblance of sanity.

#### WEFTEC 2015: The Pershing Cultivation Project

This year's project was held at Pershing Magnet School in Chicago's Bronzeville neighborhood. The principal, Dr. Safurat Giwa, and the staff at Pershing strive to infuse an appreciation and understanding of the water environment into their curriculum. As a STEAM (Science, Technology, Engineering, Arts, and Mathematics) oriented school, Pershing's objectives aligned well with those of WEF and the Community Service Project. The subcommittee and school staff worked together to develop a project which benefitted the environment while providing a significant educational component to the students.

The final design included construction of a permeable paver walkway leading to an outdoor classroom located on the school grounds. A rain garden, as well as over 25 species of native plants, grasses, and trees were planted across more than 2,000 square feet surrounding the outdoor classroom. The learning garden included an interactive tool to demonstrate how water permeates through different materials. The project aims to raise awareness about the impact and value of water among students, aligning with WEF's strategic objectives.

Volunteers showed up early on the Saturday morning of WEFTEC armed with boots, gloves, and seemingly endless energy. Participants worked alongside volunteer contractors to excavate for the outdoor classroom and planting areas. Over 40 yards of stone base was placed and compacted prior to



laying 700 square feet of pavers. Outcropping stones, weighing upwards of 1,000 lbs, were set to provide seating for students during lessons. After seven hours of work to complete the project, volunteers, students, and community members joined WEF President Ed McCormick in a ribbon cutting ceremony celebrating the accomplishment.

#### Building a legacy

The Pershing Cultivation Project was the eighth annual service project, and the third in Chicago. The inaugural service project in 2008 "Getting out of the Gutter" was located in Pulaski Park in Chicago, and saw 30 volunteers work to build a 200 square foot bioswale. In 2013 WEFTEC returned to Chicago and with it the Community Service Project. Haines Elementary School, located in the Chinatown neighborhood, hosted over 100 volunteers who removed impervious area from the school's outdoor area and transformed it into 900 square feet of rain garden.

As the number of projects in Chicago continues to grow, so does the need to maintain these sites. While an active community presence helps keep out the weeds, WEF's role has expanded to include repair and replacement of past projects' plants and hardscape. WEF looks to local member associations to assist in the maintenance of projects in each host city. To this end, CSWEA volunteers gathered the weekend prior to WEFTEC this year to rehabilitate the 2013 Haines Elementary site. It had been determined that a picket fence would be needed around the rain garden to protect the plantings, while maintaining access for



students. Six members of CSWEA Illinois Section dug and set 20 fence posts around the perimeter of the rain garden. This allowed for WEF to install the fence sections during WEFTEC and replant many of the original grasses and vegetation. The garden is once again a focal point of the urban school.

WEF and CSWEA will continue to work together over the years to come, building and maintaining projects which raise awareness and educate communities on the importance of the water environment. CS





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Winter 2015 | CSWEA 33 www.cswea.org Click HERE to return to Table of Contents

## CSWEA/IWEA Welcome Reception

By Mike Holland

Much like the way 2015 WEFTEC was record-setting in attendance, the 2015 CSWEA/IWEA WEFTEC Welcome Reception also saw new heights in member attendance and resulting bar bill. Thanks to our many sponsors and all other members who worked the phones, emails and sign-in table to make this event a success.

This year's event, held at the Hilton Chicago, was the 20th year that CSWEA and IWEA joined to host this event. An impressive turnout of over 400 members, sponsors and friends were in attendance either celebrating another great Packers year, or disappointed that the Bears decided to take the season off.

(The Vikings don't count as football anymore.) There was food and drink aplenty and the noise level was high as friends met and made plans for the week of WEFTEC. Of course, this event is only made possible through the support of our generous sponsors. With the great turnout, every donation is greatly appreciated. However, we still have a way to go to cover the tab. So if anyone who didn't sponsor ahead of time would like to now, please contact Mike Holland at mholland@dekalbsd.com. Make a note now to plan to attend the 21st Annual Welcome Reception at WEFTEC 2016 in New Orleans, September 25, 2016.

#### Thank You Sponsors!

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## **Operations Challenge**

By Todd Sheridan

Shovelers take 8th in Laboratory and 21st overall; Pumpers take 9th in Process Control and place 30th overall at the 2015 Operations Challenge (OC).

While I've only been involved with the Operations Challenge for two years, I am continuously amazed at the dedication, passion and intelligence displayed by our CSWEA OC team members. Other teams competing at the national level work with each other day in and day out, practicing year round; while the CS teams practice only twice, in some cases never having met one another until the first practice session.

It is a testament to their desire to win that CSWEA teams consistently manage to place despite coming from different plants and even professions spread throughout three states. It is wonderful to witness the nonstop flurry of e-mails, text messages and videos posted to Facebook at all hours of the day as the teams constantly strive to streamline their tasks, discuss the events and share information before the competition.

Our teams this year, the Shovelers and the Pumpers, had five veteran members returning and three new members joining the fray: Jason Neighbors of Glenbard, Marc Zimmerman of Janesville and Matt Streicher of Wheaton.

The five events are: Process Control, Laboratory, Collections, Maintenance and Safety. While each event presents a certain level of difficulty, the laboratory event in particular was extraordinarily challenging this year as it was a totally new procedure – meaning all new equipment needed to be rounded up, and each team member's task had to be divided up and learned from scratch.

As in years past, there were two practices prior to WEFTEC, both held at the Madison MSD Nine Springs Plant. For 25 years,

Paul Nehm and the staff at Madison have graciously welcomed the teams and helped out in any manner possible. Montgomery Baker, our CSWEA Lab Guru, once again worked tirelessly to train people in just two days who may never have set foot in a lab to compete in a national competition.

Special regards go out to GBWA who lent a 4" Godwin pump, Thern who lent one of the actual gantries used in the OC competition, and Jeremy Cramer at Fond Du Lac who purchased the spectrophotometer that will be used in the laboratory event for at least the next three years. We also received a record nineteen sponsorships this year, which goes a long way in offsetting the cost of travel and lodging for the training sessions and competition.

I would like to offer sincere thanks to everyone who has supported the Operations Challenge teams this year and in years past. Without the dedication of the sponsors, CSWEA & state sections, people cheering the teams on at the competition, and the significant others of the team members who had to listen to talk of pipetting and sawing pipe for two straight months, none of this would be possible.

#### 2015 Team Roster:

**Pumpers:** Captain Mike Murphy, Green Bay New Water; Marc Zimmerman, Janesville WWTP; Jason Neighbors, Glenbard Wastewater Authority; Matt Streicher, Wheaton SD; and Coach Tom Dickson, City of Oconomowoc, WI.

**Shovelers:** Captain Chris Kleist, City of Duluth; Justin Pratt, City of Moline; Chris Lefebvre, Stevens Point WWTP; Joe Rubbelke, Minnesota Pump Works; and Coach Jim Miller, Wenck Associates. CS









"Without the dedication of the sponsors, CSWEA & state sections, people cheering the teams on at the competition, and the significant others of the team members who had to listen to talk of pipetting and sawing pipe for two straight months, none of this would be possible."

## Student Paper/Design Competition

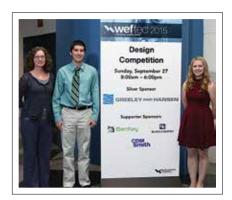
By Mike Holland

Central States was once again well represented at the WEF Student Design Competition at WEFTEC 2015 in Chicago.

The 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 the water/wastewater

engineering and sciences field. CSWEA developed the competition criteria based on WEF guidelines. Then student chapters were notified of the competition during the fall semester of the 2014-15 school year.

There are two levels of competition: 1) Wastewater Design, which includes traditional wastewater design projects;





and 2) Environmental Design, which includes contemporary engineering design topics such as sustainability, water reuse, wetland construction and Engineers Without Borders projects. This year CSWEA introduced the Global Water Stewardship project in Piedras Blancas, Costa Rica as the Problem Statement in the Environmental Design category.

The competition was held the day before the Education Seminar in Madison where CSWEA had entries in both levels. The winners of the Wastewater Design competition were Sarah Beam, Josh Koopmann, and Bryce Corrigan from the University of Wisconsin – Platteville, who presented their project on the "Baraboo, WI Wastewater Treatment Facility Design."

The winners of the Environmental Design also came from UW Platteville. Team members Devin Peterson, Curtis Veit and Dylan Friss presented "Costa Rica Wastewater Management: Piedras Blancas Collection & Treatment" as their project. Members of the team also accompanied CSWEA members to Costa Rica over the summer to refine the design for the Piedras Blancas project and assist with site investigations for next year's problem statement.

Both teams gave exceptional presentations of their projects during WEFTEC where they faced stiff competition from schools throughout the country. Their hard work did not go unnoticed. They did a great job and should be as proud of their presentations as we were of having them represent CSWEA at the WEF level. CS



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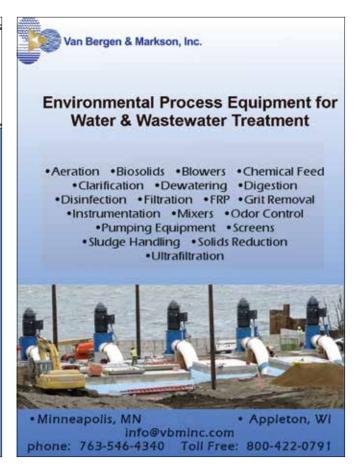
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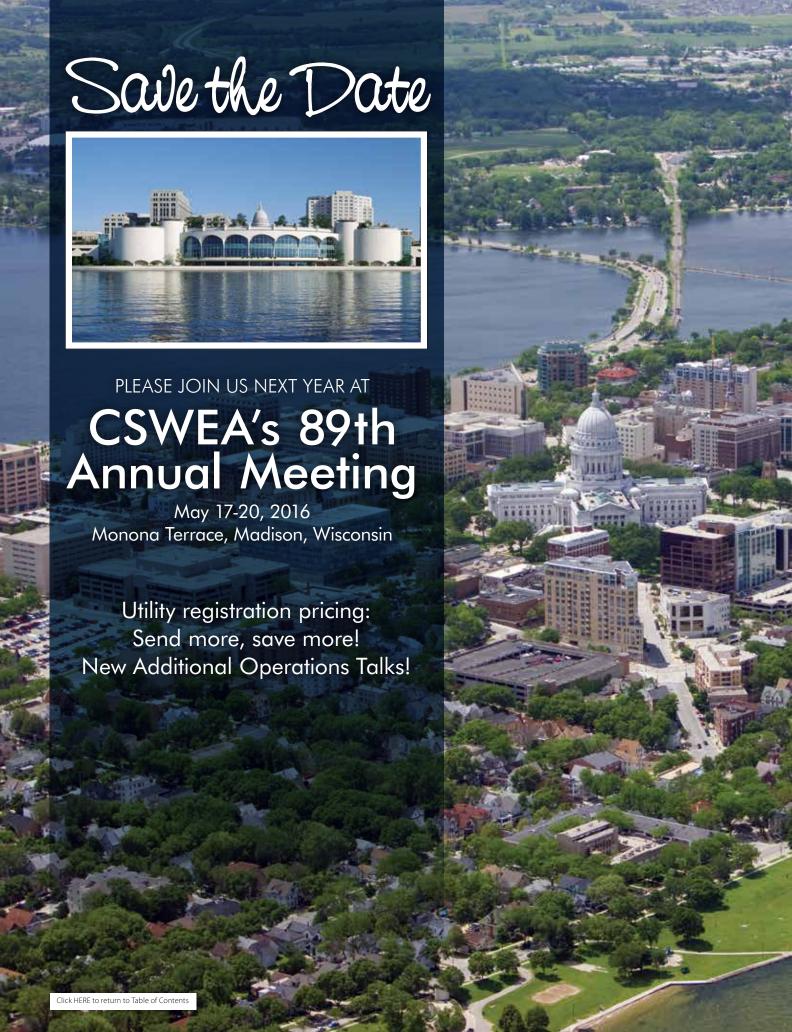
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# 89th Annual Meeting Highlights

The 89th Annual Meeting of the Central States Water Environment Association, Inc., will be held May 17-20, 2016 at the Monona Terrace, Madison, Wisconsin. This year, we will be introducing a half day track focused on **stormwater and watershed topics**, as well as our utility pricing, ethics sessions, and utility management track.

#### **FEATURED TOPICS**

- Operations and Maintenance
- Resource Recovery Nutrients and Energy
- Technology/SCADA/ Web-based
- Maintenance Programs/GIS
- Applications

- Troubleshooting
- Case Studies
- Summary of Completed Projects
- Optimization
- Process Control
- Start-up Issues

#### SOFT SKILLS/LEADERSHIP SESSIONS

This year's conference will feature sessions on soft skills/ leadership to provide options for attendees looking to hone their interpersonal, management, and communication skills.

#### Examples of topics that may be featured:

- Leadership Skills
- · Managing the III 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 Handbooks and Policies Violate Labor Law?
- Management Rights for Managers
- Social Media and the Workplace

#### **UTILITY MANAGEMENT TRACK**

This track consists of operations and utility management topics. Troubleshooting, optimization studies, case studies, and completed projects are an example of the topics that will be included for Operators in the Utility Track. Leadership, financial planning, retention, and sustainability practices are examples of topics that will be included for managers in the Utility Track.

#### **ETHICS TRAINING**

Two hours of ethics training, as required by WI and MN Professional Engineer Certification Requirements, will be added to the program as well for those engineers that require this to maintain their license.

#### **UTILITY MANAGEMENT**

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

#### **ENERGY PRODUCTION, RECOVERY, & EFFICIENCY**

- Digester Gas Technologies
- Co-digestion
- Heat Recovery Technologies
- Efficiency (pumps, motors, lights, UV disinfection, HVAC, etc.)

#### **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

#### **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

#### **RESIDUALS, SOLIDS, & BIOSOLIDS**

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

#### **WATERSHEDS**

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

#### **GENERAL**

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

# Send More, Save More!

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#### **UTILITY REGISTRATION PRICING**

Based on the success in 2015, CSWEA will continue to offer flat rate utility pricing for the Annual Meeting. The pricing allows utilities to pay a flat fee for registration with the cost determined by their treatment plant design size. For that price, a utility may send as many people as they want to the annual meeting. The utility would still have to purchase event and meal tickets separately for each individual. The only included meals would be the continental breakfasts, coffee/snacks, and box lunches.

Five tiers have been set up for the Utility registrations.

#### PRICING TIERS FOR ANNUAL MEETING

MICRO UTILITY (<1 MGD or Collection Only) @ \$150

 SMALL UTILITY
 (1-5 MGD) @ \$250

 MEDIUM UTILITY
 (5-10 MGD) @ \$500

 LARGE UTILITY
 (10-25 MGD) @ \$800

 MEGA UTILITY
 (>25 MGD) @ \$1500

#### COST COMPARISON (OLD vs. NEW) - using simple pricing

An Example of the cost savings is below.

#### **OLD Pricing**

Sample pricing for a 7 MGD Treatment Plant Old Pricing with 6 attendees:

Attendee	Reg Type	Reg Cost	Events	Meals	Subtotal
District Manager	Full	\$325	\$110	\$120	\$555
Asst Manager	Full	\$325	\$95	\$105	\$525
Chief Operator	Full	\$325	,	\$45	\$370
Maint Manager	Thu Only	\$190		\$45	\$235
Operator 1	Thu Only	\$175			\$175
Operator 2	Wed Only	\$190	,	\$190	
TOTAL		\$1,530	\$205	\$315	\$2,050

#### **NEW UTILITY PRICING** With 2 more Operators and 1 Trustee Attending

Attendee	Registration Type	Registration Cost	Event	Meals	Subtotal
Utility Regn	5-10 MGD	\$500			\$500
District Manager	Full		\$110	\$120	\$230
Asst Manager	Full		\$95	\$105	\$200
Chief Operator	Full			\$45	\$45
Maint Manager	Thu Only			\$45	\$45
Operator 1	Thu Only				
Operator 2	Wed Only				
Operator 3	Thu Only				
Operator 4	Wed Only				
Trustee	Thu Only			\$120	\$120
TOTAL		\$500	\$205	\$435	\$1,140

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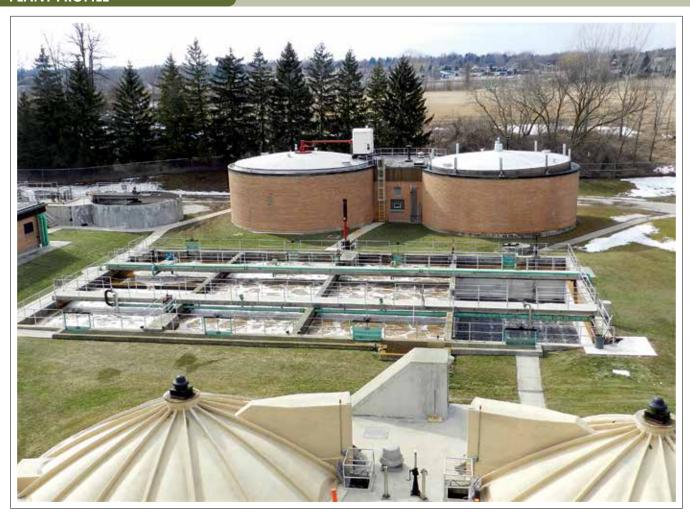
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# City of Kiel, Wisconsin

By Thomas J. Kispert, P.E., BCEE, CCS Associate/Senior Project Engineer, McMahon Group

#### **INTRODUCTION**

The City of Kiel, Wisconsin, provides advanced wastewater treatment for residential and industrial wastewater generated within the City corporate limits, as well as high strength wastewater generated from outside sources. Treated effluent is discharged to the Sheboygan River.

Originally constructed in 1965, the facilities were upgraded in 1979 with two new final clarifiers. Since then, the Wastewater Treatment Facilities had smaller upgrades and revisions, including headworks revisions in 1996, aeration and solids handling upgrades in 1997, main pump house upgrades in 2001 and 2014, aeration in 2008, and biological phosphorus removal in 2011.

High strength wastewater is received from three local dairy facilities. Two of the facilities are planning significant increases in their flows and loadings. Due to the age of the existing facilities and the projected flows and loadings, the City of Kiel has retained the McMahon Group to undertake facilities planning.

#### TREATMENT PROCESS

#### Genera

The Wastewater Treatment Facilities flow scheme for liquid treatment includes raw sewage pumping, quarter-inch fine screening, aerated grit removal, primary clarification, fine bubble aeration with selector zones, final clarification, tertiary filtration, chlorine disinfection and postaeration. The solids flow scheme includes co-settling of waste activated sludge (WAS) in the primary clarifiers, anaerobic digestion, belt press dewatering, Class A in-vessel pasteurization process, biosolids storage and land application.

#### Influent Pump Station

The River Road Pump Station is the main influent Pump Station. The station has been upgraded over time, and currently has three 33-HP immersible pumps in a dry pit arrangement. With a firm capacity (one pump out of service) of 2.42 mgd, wastewater is transferred to the Wastewater Treatment Facilities' site via 8 and 12-inch parallel force mains.

#### Headworks

Flows from the River Road Pump Station are split between two spiral fine screens with quarter inch perforated openings. Each has a rated capacity of 4.3 mgd.

Grit removal consists of an aerated grit chamber, air lift pump and grit classifier.

#### **Primary Treatment**

Following screening and grit removal, influent wastewater flows to two 28-foot diameter circular primary clarifiers. The concrete is original to 1965, while the mechanisms were upgraded in 1979. Settled solids are pumped to the anaerobic digestion system for stabilization.

#### **Secondary Treatment**

Primary effluent flows by gravity to three secondary treatment trains, each consisting of an anaerobic selector zone and aeration zone. The anaerobic zones make up about 18% of the total treatment volume and promote Biological Phosphorus removal. The anaerobic zones are mixed using hyperbolic mixers. The aeration basins are mixed and aerated using ceramic fine bubble diffusers and air supplied by two 100-HP and two 150-HP positive displacement blowers.

The south basins consist of four tanks, where the anoxic/anaerobic zone takes a portion of Tank 1, and the remainder of Tank 1 and Tanks 2 and 3 are aerated. Tank 4 is used to receive hauled-in high strength waste.

The mixed liquor flow from the aeration basins flows to two 40-foot diameter circular secondary clarifiers.

Return activated sludge (RAS) is pumped to the anaerobic zones from a collection box using centrifugal pumps, and a small rotary lobe pump drawing from the RAS pump suction is used to divert the WAS stream to the primary clarifiers for co-thickening.

#### **Tertiary Treatment**

Secondary effluent is pumped to four gravity filters with sand media. The filters provide total surface area of 576 square feet, and have a media depth of 2.5 feet. The three dry pit centrifugal filter feed pumps have a firm pumping capacity of about 3.74 mgd with one pump out of service. The filters have a rated flow capacity of 2,160 gpm or 3.1 mgd based on a loading rate of 5 gpm/square foot with one filter out of service. Filter

backwash water is supplied by two vertical turbine pumps capable of backwashing at a rate of 20-feet/second. A positive displacement blower provides air scouring during the backwash cycle. Waste backwash water is handled using two dry pit centrifugal pumps.

#### Disinfection

Filtered effluent is disinfected prior to discharge using gas chlorine. Chlorine gas is stored in 150 lb. cylinders and daily use averages about 25 ppd. Flow can be split between two plug flow chlorine contact basins. Sulfur dioxide is used for effluent dechlorination, and is also stored in 150 lb. cylinders.

#### **Solids Handling**

The solids handling process at the Wastewater Treatment Facilities include the following major unit processes:

Anaerobic Digestion
Belt Press Dewatering
Class A Pasteurization System
Biosolids Storage







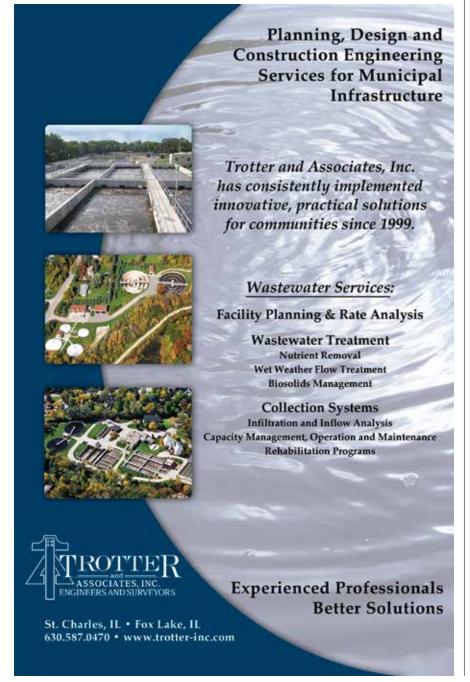
Primary sludge generated in the primary clarifiers is pumped to the anaerobic digestion complex. WAS is currently pumped with a small rotary lobe pump to the primary clarifiers for co-thickening and processing through the anaerobic digestion system. The anaerobic digestion system consists of two 45-foot diameter anaerobic digesters. The sludge is first sent to the primary digester, which is heated, mixed via a gas mixing system, and has a fixed cover. From the primary digester, the sludge is pumped to the secondary digester, which is not heated or mixed. The secondary digester has a floating cover for biogas storage. It basically provides storage and allows the digested sludge to become less active prior to being transferred to the dewatering facility.

Following digestion, the stabilized sludge is pumped to aerated holding tanks, and is dewatered with a 2.0-meter belt press. The dewatered solids or cake is conveyed to a pasteurization process to produce a Class A biosolid. The pasteurization process utilizes either lime or fly ash to produce the heat and dryness required in the process. The biosolids from the in-vessel system are transported by truck to the on-site 80-foot x 140-foot Biosolids Storage Building, pending land application.

#### Combined Heat & Power (CHP)

The city is currently undertaking a Combined Heat & Power (CHP) project, parallel to the current Facilities Planning process. Major equipment items, including biogas conditioning for moisture, H<sub>2</sub>S and siloxane removal, and a 280 kW engine generator, are being procured directly by the City for installation by contractors. With an estimated project cost of \$1.2-million, the City of Kiel was able to secure a \$500,000 grant from Focus On Energy, reducing the capital outlay for the project and reducing the straight-line payback to less than three years.

The system is expected to produce two million kWH per year, and supply hot water for the anaerobic digestion process and building heat. (S



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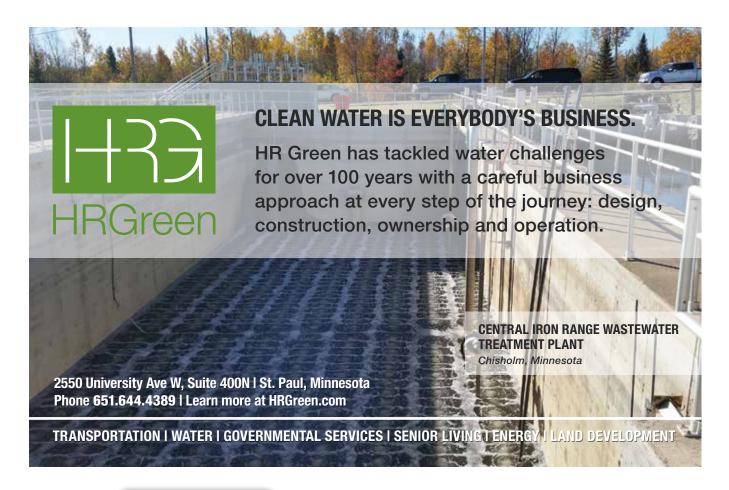
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# Government Affairs Update



By Brandon Koltz, Brandon Koltz Water & Environmental Consulting LLC

The WEF Government Affairs Committee (GAC) meets during WEFTEC and hosts a luncheon for representatives of Member Association GAC representatives. I am serving as the WEF GAC Member Association Liaison subcommittee chair. Central States Wisconsin and Illinois Sections were represented at the luncheon by Paul Boersma and Carl Fischer, respectively. The WEF GAC strives to increase dialogue and share experience with respect to local regulatory initiatives. Member associations reported many issues at the state level similar to those for the Central States:

- Nutrient criteria
- SSO regulations and compliance
- Ammonia criteria
- Temperature regulations
- Variance procedures
- · Diminished funding for state agencies

## Potential requirements for overflow control

The hottest topic for the committee was the proposed change to overflow control for communities in the Great Lakes Basin. Senator Kirk (R, IL) attached a Clean Water Act amendment to the Senate appropriations bill that would prohibit any overflow (CSO or SSO), prohibit wet weather treatment that includes blending of wet weather flow (even if secondary treatment standards are met at the outfall), and increase penalties to \$100,000 per occurrence with the proceeds going to a new Great Lakes improvement fund. WEF has organized a webinar and, in collaboration with the National Association of Clean Water Agencies (NACWA) worked with members to contact their legislators to understand the implications of this amendment. NACWA has surveyed dischargers in the Great Lakes Basin and estimates it would add \$70 billion in cost for this increased level of control beyond that established in permits or required by consent decrees. If this amendment becomes law, it would establish significantly different wet weather control

requirements within and outside the Great Lakes Basin. Some states (like Wisconsin) have historically made control requirements consistent across the state. And there may be pressure to make wet weather control requirements the same nationwide. So this change ultimately would have implications for all POTWs.

As of late October, Congress has agreed to a budget total with an increase in the debt ceiling through 2017, but the distribution of funds is yet to be worked out in conference committee. The resolution will be in an Omnibus bill passed by both houses of Congress, scheduled to be completed by December 11. The Kirk Amendment remains in the Senate version of the budget bill as of this date.

#### U.S. EPA update at WEFTEC

Office heads from U.S. EPA
Headquarters provide updates at
WEFTEC with respect to upcoming
regulatory and policy initiatives. The
Office of Science and Technology is
working on the following items:

- Selenium water quality criteria.
   Selenium is bioaccumulative; updated criteria will update 1999 criteria. It will be based on fish tissue concentrations and related back to water column concentrations. The comment period closed and publication is expected in FY 2016.
- Copper, Cadmium and Aluminum.
   Updated water quality criteria will be published for public comment in FY 2016.
- Specific conductivity. States will be allowed to develop site specific criteria focused on mixtures of ions dominated by sulfate, bicarbonate, calcium and magnesium. Public comment period is expected during winter of 2016.
- Aquatic Life Criteria. An expert workshop examined new methods to update EPA's 1985 Aquatic Life Criteria for Toxics. A science plan, peer review, internal and external peer review, and draft for public comment is planned for 2016.

- Biosolids. The Biosolids Core Risk Assessment Tools and Users Guide will be published as well as draft risk assessments for ten priority pollutants.
- Coliphage. Water borne infections are more commonly caused by viruses than bacteria. Coliphage is being examined as a better indicator of human health risk than the 20102 recreational bacterial indicators (E.coli and enterococci). U.S. EPA published "Review of Coliphages as Possible Indicators of Fecal Contamination for Ambient Water Quality" in April 2015 found at http://water.epa.gov/scitech/ swguidance/standards/criteria/health/ microbial/upload/coliphages-literaturereview-report-2015.pdf. This document includes a discussion of disinfection with respect to Coliphage inactivation. A webinar was presented in October, the slides are found at http:// water.epa.gov/scitech/swguidance/ standards/criteria/health/microbial/ upload/webinar-10-15-2015-coliphage. pdf. Permittees should closely follow the development of this potential human health criterion. If adopted, there may be impacts to disinfection methods, laboratory requirements and wet weather management practices. A panel of scientific experts in coliphage, environmental microbiology, and environmental epidemiology is being assembled to discuss key issues. They will meet in a workshop in Spring 2016.
- Numeric nutrient criteria. U.S.
   EPA expects that states will ultimately develop numeric nutrient criteria.

   They are developing science products based on state and tribal comments to assist in this effort. A final technical support document on Biological Condition Gradient will be available December 2015.
- Steam Electric Power Generation Effluent Guidelines. Final rules were published updating the 1982 requirements. Dissolved metals and nutrients have been added to the total suspended solids effluent limits

previously required. They are found at http://www2.epa.gov/eg/steam-electric-power-generating-effluent-guidelines-2015-final-rule.

 Pretreatment Standards for the Dental Category. EPA published the rule in October 2014 requiring best available control technology or Best Management Practices. Comments are currently being reviewed.

EPA actively encourages innovation, looks to remove barriers to innovative processes and practices and believes that innovation is the key to a sustainable water future. See <a href="http://www2.epa.gov/innovation/watertech">http://www2.epa.gov/innovation/watertech</a>.

#### Waters of the United States

The final rule was published in August 2015 clarifying waters that are subject to provisions of the *Clean Water Act*. At the time of WEFTEC, U.S. EPA was beginning implementation in all but 13 states that had filed a court challenge to the rule. On October 9 the U.S. Court of Appeals for the 6th Circuit stayed the Clean Water Rule nationwide. Until the court cases are decided, the EPA and the Army Corps of Engineers will make determinations on a case by case basis applying relevant case law, applicable policy and the best science and technical date.

#### **Finance**

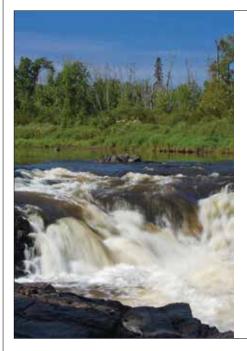
SRF capitalization in the draft budget proposals would be similar to the FY 2016 appropriation of \$1.02 billion in FY 2015. Illinois was allocated approximately \$44.8 million, Minnesota \$18.1 million, and Wisconsin \$26.7 million in FY 2015. The overall FY 2015 appropriation was about 29% less than 2013. Final appropriations won't be known until the budget reconciliation in December. There is an appropriation of for a pilot program for the Water Infrastructure Finance and Innovation Act in the Senate Budget but not the House Version. WIFIA would provide low interest financing for projects costing over \$20 million. Again, funding won't be finalized until the reconciled budget is passed.

U.S. EPA established the Water Infrastructure and Resiliency Finance Center to provide communities with approaches for effective financing

www.cswea.org

water infrastructure projects utilizing federal, state, local and potentially private resources with the goal of increasing overall funding availability. The Center will also support and expand capacity building through collaborative technical assistance. For more information on the Finance Center see <a href="http://www2.epa.gov/waterfinancecenter/about-water-infrastructure-and-resiliency-finance-center.">http://www2.epa.gov/waterfinancecenter/about-water-infrastructure-and-resiliency-finance-center.</a>

U.S. EPA has significant actions planned for the next year, but must accomplish them with diminished funding. With the upcoming presidential election, and the changes in congressional leadership it remains to be seen if the agency will be able to accomplish its goal. To keep up with activities, subscribe to WEF's "This Week in Washington", delivered by e-mail. CS



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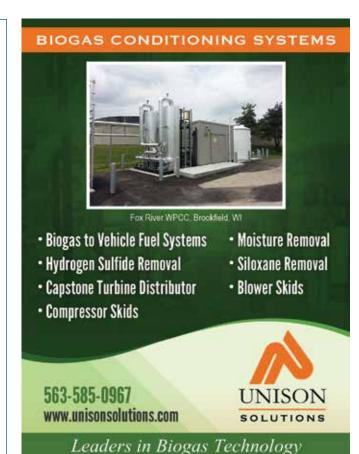
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# 30th Annual Conference on the Environment

A huge thank-you to all attendees, speakers, exhibitors, and sponsors for your contribution to a successful Conference on the Environment. This annual Minnesota State Section event is a joint effort with the Upper Midwest Air and Waste Management Association (A&WMA) and was hosted on November 4 at the Minneapolis Convention Center (MCC). More than 350 attendees, students, speakers and exhibitors were present at the new location for topics related to Collaboration and Innovation including: a keynote address by Cam Gordon from the City of Minneapolis, regulatory updates, technical sessions, and the student environmental challenge. Council member Gordon provided an overview of current environmental initiatives under way in The City of Minneapolis; the Minnesota Pollution Control Agency (MPCA) provided relative water and air quality regulatory updates; and numerous technical professionals addressed current topics of interest ranging from nutrients, to renewable energy to pretreatment and industrial issues. Awards were presented to the winning Student Environmental Challenge team from North Dakota State University and the Minnesota Section Industrial Award recipients from the City of Becker and Liberty Paper.

The new venue provided ample space for our growing number of attendees (up more than 20 percent from 2014!) with room for additional exhibitors and an end of day social hour.

A special thanks to Tracy Hodel, Kathryn Anderson, and all planning committee participants for your behind the scene efforts. Planning for next year's event is already under way – please contact Lana Tullis at lanatu@bolton-menk.com for information regarding upcoming planning committee activities.

If you were not able to attend this year, many of the conference materials are located on the Central States website under Minnesota Resources at www.cswea.org/MINNESOTA/seminarproceedings.

We look forward to seeing you next fall at the 31st Annual Conference on the Environment, November 9, 2016.

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# National Ingenuity Contest Champs Stun Judges with Amazing Ideas

By Steve Spicer, Managing Editor of Water Environment & Technology Magazine



Four inventors received awards from the 2015 Ingenuity Contest at WEFTEC® 2015 in Chicago. This marks the fourth year that the competition has recognized fixes that tackle a persistent problem with nothing more than the materials at hand and a hearty dose of ingenuity.

## Captains of the Inspection Squadron

When the City of Casper, Wyo., worried about the condition of the pipes within its water resource recovery facility, the wastewater crew found a floating solution. The crew – Lane Christensen, David Ferguson, Matt Wilhelms, Jared Winzenried, Brody Allen, and James Soller – pieced together some foam-board, a piece of wood, rope, and fasteners to create a raft for its collection system camera. The crew nicknamed the contraption The U.S.S. WWTP.

The crew needed a way to guide the camera through the pipe safely and ensure that it could be recovered at the downstream manhole. To accomplish this, the crew first dropped an inflatable ball attached to several hundred feet of twine into the pipe and tied the twine



The U.S.S. WWTP sits ready to sail through the facility's pipes. Credit: City of Casper, Wyoming

to the upstream manhole. When the ball made its way to the downstream manhole, the crew retrieved it with a hook. This left a long stretch of twine running the length of the pipe between the manholes.

Next, they tied the U.S.S WWTP to the twine at the upstream manhole, gently lowered it into the pipe, and then pulled at a steady rate from the downstream manhole. Upon arrival at the downstream manhole, the U.S.S. WWTP was removed using the longhandled hook.

The video collected from the camera was invaluable. It showed areas of severe corrosion and pipe collapse that must be repaired in the near future.

## Valedictorians of the school of hard knocks

During a March 2011 thunderstorm, operators at the Hill Canyon Wastewater Treatment Plant (Thousand Oaks, Calif.) noticed the pipe from secondary clarifiers to emergency retention basins was not flowing fully. After the storm, the crew – Mark Capron, Mike Mantor, and Robert Richardson – determined that nothing but air was blocking the pipe,



Jacksonville's (Ark.) smoke testing display helps customers understand the inspection process.

Credit: Jacksonville Wastewater Utility

but it remained less than half full.

They realized that the high point of the base of the 875-mm (36-in.) diameter pipeline was too high. This configuration led to empty space within the headspace of the pipe.

Restoring the pipe's full 189-m³/d (50-mgd) flow required getting the air out at the high point. Instead of a major construction project to lower the high point of pipe to prevent the air blockage, the crew installed a \$500 vacuum pump to the exiting air release valve.

When the pipe is full of air, one vacuum pump requires a full day to remove all the air. After the air is removed, the pumps run less than 100 hours per year in sub-second bursts. The crew also decided to leave the air release valve itself in place to prevent the vacuum pump from pulling in water.

With the air removed, the line regained its full capacity.

#### Master of the machines

Vikas Bhaskaran, senior skilled trade technician at the Village Creek Water Reclamation Facility (Fort Worth, Texas), builds tools to aid his fellow mechanics. He created a plasma and oxy-acetylene



Building a precision cutting tool from salvaged parts enables the Village Creek Water Reclamation Facility (Fort Worth, Texas) to make the custom pieces it needs for repairs.

Credit: Village Creek Water Reclamation Facility

The submission window is open now until May 26, 2016. See the full entry details at www.weftec.org/ingenuity. Author Steve Spicer can be reached at SSpicer@wef.org.

cutting machine using parts salvaged from old traveling bridge filters. The machine cuts metal precisely to enable operators to fabricate metal pieces for custom repairs. Bhaskaran also created a ratchet to help remove and attach the stator from a screw pumps more safely. The ratchet enables a single person to do a task that, before, took five people.

#### Dean of public education

The Jacksonville (Ark.) Wastewater Utility wanted to educate customers about how line inspections work. To achieve this, operators, led by Walton J. Summers II, built a display that includes a replica manhole, lateral, and cleanout cap. Part of the display gives an underground view of the lateral, which is cracked and wrapped with tree roots. Operators can

show residents how smoke added to the manhole seeps up out of the grass – green outdoor carpet – and signals the need to televise the line to produce a defect drawing.

#### Share your ingenious fixes

The WEFTEC Ingenuity Contest will return in 2016 to honor more smart fixes and quick repairs. So, throw together a roughly 1-page description of the problem you faced and the fix you found. If your invention or idea can be photographed, snap a picture.

The submission window is open now until May 26, 2016. See the full entry details at www.weftec.org/ingenuity. Author Steve Spicer can be reached at SSpicer@wef.org.

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# WEF Fact Sheet Summarizes Air Quality Permit Pitfalls, Resources

By Myron Bachman



Air permitting is a challenging part of installing a combined heat and power (CHP) system. A new fact sheet, Air Quality Permitting, outlines the requirements and processes that utility managers will likely encounter in the air permitting process as well as available resources.

The fact sheet, which can be viewed at http://www.wrrfdata.org/AirPermittingFS/WEF-AirPermittingFactSheet2015.html, was produced by the Bioenergy Technology Subcommittee CHP Task Force of the Water Environment Federation Residuals and Biosolids Committee.

# Challenges of differing requirements, terms

One of the reasons that air permitting is a challenge is that there is little consistency in how to accomplish it or what will be required. In addition, the Federal Clean Air Act is one of the most complicated components of the Code of Federal Regulations. Each state is allowed discretion for air quality in its jurisdiction, as long as its regulations are as stringent as the federal ones.

Some states have promulgated regulations that are substantially more stringent than the federal standards. Also, some states have not only passed such stringent state programs, but have also divided themselves into subdivisions, each with different requirements. An example of this is California, which is divided into 35 air districts, each of which has its own regulations. Such requirements are different enough from each other that they are often unrecognizable as having come from the same state.

In addition, terminology can vary among agencies. To some, the initial

permit is a "Permit to Construct," for others an "Authority to Construct," and for others, it's an "Approval Order." Some agencies use the term "volatile organic compounds" (VOCs) to describe the organic gases that act as precursors to ozone formation in the atmosphere, while other agencies call them "nonmethane hydrocarbons" (NMHCs), and still others, "precursor organic compounds" (POCs).

Innumerable examples of terminology confusion exist. The fact sheet uses terms that are most commonly encountered across the country.

#### Fulfilling requirements

Air quality requirements can be divided into three categories: Administrative, Performance Standards, and Permitting. Each is independently applicable, and an exemption from one is not necessarily an exemption from all.

At a high level, the process of acquiring an air permit is nearly the same in all jurisdictions. Generally, after a permit application is prepared and submitted, it is reviewed by the permitting agency, and in some cases, it requires review by the public. The permit is either granted or denied. In many jurisdictions, a temporary permit is granted that authorizes construction. After construction is complete and the facility is assured to function as permitted, a final permit is issued.

## Involve regulators early in the process

An important consideration when beginning the permitting process is a permitting strategy. This strategy should consider all aspects of the permitting process and is described in Air Quality Permitting. One of the most important elements, however, is agency interaction. The ultimate goals of agency interaction are to make the permitting process move as smoothly as possible and to minimize the number of requirements imposed on the permit. It is important to consider what opportunities are available for agency interaction, the specific goals of each interaction, and how to approach the agency, both generally and specifically at each interaction.

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Myron Bachman is a plant superintendent at the North Davis Sewer District in Syracuse, Utah. He can be reached at MyronBachman@ NDSD.org





# Illinois CSWEA Volunteerism: We Want You

by Erik Lanphier

he active participants in the IL Section of CSWEA are vivacious and full of energy. We can always use more... and hope that the network of individuals that we CSWEA Members communicate with day-in-and-day-out advocate volunteerism.

Since the last time I wrote to you, the IL Section met successfully to discuss a desire to reach out with public relations and education at schools K-12. Now some of us are reading this and saying "whoa, we are already doing that." If as a sanitary district, municipality, or a consulting group, you are doing that, broadcast it!

The IL Section has also been cranking out new ideas for membership including a welcome packet with a New Membership Welcome Letter and CSWEA portfolio. This is a great way to give CSWEA additional presence at meetings and seminars while demonstrating our appreciation for each new member.

#### **ILLINOIS COMMITTEE NEWS**

The **Pre-Treatment Committee** has a new chair, and with the challenges it is facing, the committee might need some help. Fats, oils and grease are a mess (pun intended), and so are the pretreatment regulations surrounding design, approvals, monitoring and enforcement of grease interceptors. Specifically, I'm referring to certain Illinois Department of Public Health (IDPH) rules. The issue is plumbing codes that affect the *influent* of grease interceptors versus the discharge standards that the EPA has set on the *effluent* of the grease interceptors.

A pretreatment seminar is being discussed with the **Laboratory Committee** which would cover new regulations and ordinance creation for the pre-treatment programs.

The **Young Professionals Committee** organizes wonderful opportunities to network and get involved. Its chair is full of great ideas, and it always needs members to make these ideas *POP*! So get out there and pay attention to the website and email blasts. Go have fun while socially building relationships with industry professionals!

The **Collections Committee** reports that the annual collections seminar co-hosted with IAWA and APWA was the *LARGEST* ever! Now that's what I am talking about: 107 attendees of which 48 were CSWEA members. The volunteers



that expend the energy to discuss, plan, organize and coordinate these events get their satisfaction from the support of the attendees. Congratulations on your success this past summer!

The **Biosolids Committee** chair hosted a Biosolids seminar on November 19. The work the committee has done in preparation was appreciated by all.

The **Operations Committee** did a great job coordinating with both CSWEA Operations Challenge Teams: the Pumpers and the Shovelers.

The teams represented CSWEA well at WEFTEC. I know I don't just speak for myself when I say that we are all very proud of the hard work and dedication that the team members put into practice and participation in the Operations Challenge.

The **Safety Committee** chair is getting things kick-started with Storm Tracking training for severe weather. There are also future plans for classroom and field safety training. Check the web page and watch for email blasts with information pertaining to these training opportunities.

**Government Affairs Committee** is growing! Three people strong and never satisfied, they are always looking for more help. They are also looking for topics for the next seminar which is tentatively scheduled for March 22, 2016 in conjunction with the IAWA mini-conference in Springfield.

The **Energy Committee** is creating sparks by providing information to the members about DCEO energy grant opportunities (pending state budget approval). The chair is also working with IL Section CSWEA members who are interested in Power Purchase Agreements (PPAs) for solar energy. Keep your eyes and ears focused on opportunities for services at reduced or no costs to owners.

I also want to give a huge shout out to all of the dedicated professionals involved with the **Global Water Stewardship** program! This is an amazing effort that CSWEA launched in 2013 to help solve water treatment issues around the world. It is a way for our membership to use their tremendous talent as water treatment professionals to improve the health and lives of people who lack the resources to do it on their own. CSWEA is actively seeking sponsorships and volunteers willing to help design, install, operate and mentor in order for the current Costa Rica project and future projects to be successful.

Thank you for reading my quarterly section message and have a happy holiday season. (S

# CSWEA, Change and You

By Lana Tullis

e live in a world of continual change. Technological advancements, water quality regulations, sanitation needs, and, as always, the weather. Like any organization, CSWEA must evolve to stay current with our changing world and true to our mission.

To provide a Water Environment Federation (WEF) organization (Illinois, Minnesota, Wisconsin) 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.

The need to adapt to changing member needs, technology and water quality issues is recognized. Unfortunately, it's not always clear how your needs are changing. Your opinions impact change within the organization driving new opportunities, topics and activities. Success of many organizations is often measured with predefined numerical metrics such as membership, abstract submissions and award nominations. CSWEA's success also resides in our ability to respond to your requests. Speak up and be heard. What other publications, events, activities, and information are you looking for?

Advancements in technology provide improved levels of treatment and new treatment alternatives. Technology has changed the way we communicate, too. The Internet, smartphones, and specialized applications all facilitate new and innovative ways to share ideas and collaborate on solutions. Despite new methods of communication, traditional events such as the Conference on the Environment (COE) provide an excellent opportunity to network and discuss innovative treatment technologies such as advanced biological nutrient removal (BNR) systems (Session 3) and solar and biogas projects (Session 7). This Minnesota Section event has grown to over 300 attendees and 17 exhibitors and has expanded to include new topics, a mentor program and happy hour. I hope you were one of the 300+ attendees and look forward to hearing your thoughts on how COE can be even better next year.

Regulatory updates from the Minnesota Pollution Control Agency are a cornerstone for the COE technical sessions. Current priority projects include chloride, nitrate, ammonia, sulfate, bacteria and eutrophication standards. Do you feel the COE, CSWEA Annual Meeting and the MN Innovative Operations Conference provide sufficient coverage for current regulatory issues? What about CSWEA's use of technology throughout the year? Are there changes such as webcasts or committee blogs that interest you?



The Global Water Stewardship program, developed in 2013, is an example of member-driven change within Central States. This program utilizes your skills as water treatment and/or environmental professionals to educate, engineer and construct sanitation solutions contributing to clean waterways and healthy communities throughout the world. This program unites members with a common goal and has shown increased member activity at all age levels, with significant interest by the student and young

professionals. What motivates you, or would increase your current level of involvement? Are you seeking more information on an existing committee, or programs such as the Operations Challenge, Stockholm Junior Water Prize, or Student Environmental Challenge? Perhaps you have another area of interest or would like additional facility tours or social events.

Add to the mix, weather. We know that's always changing. This article was drafted amidst freezing rain and temperatures in the 40s. Today, it's a sunny 70 degrees! This is considered normal for Minnesota. On the other hand, recent reports suggest Minnesota temperatures are measurably warmer than previous decades with more erratic and heavier rainfall events. Whether or not you are convinced climate change and global warming are real, accurate weather data is critical to the design process. Are you interested in more information related to weather changes and associated design guidance? How about stormwater and other water resource related topics?

CSWEA exists to offer multiple opportunities for the exchange of water quality knowledge and experiences. The goal is static, but the opportunities, knowledge and experiences must evolve. Share your thoughts and ideas, complete those dreadful surveys and, better yet, take action.

Contact me or any other chair with your ideas. Attend the Minnesota Section business meetings (November, February and May) and committee meetings (year round) with a halfday MN Section event (April) that brings all Minnesota section committees together to establish goals, share ideas, successes and failures. Don't forget the Innovative Operations Conference (February 9, 2016) and the Central States Exchange (CSX) in July and CSWEA Annual Meetings (May).

Our world is changing. But the need for clean water and demand for facilities, operators, engineers, and technicians will never change. By providing the knowledge and resources to adapt to changing criteria, technology and regulations, we can make a difference. Only your input enables CSWEA to adapt to our changing needs.

# A Time to Reflect on Successes

By Daniel Zitomer

his holiday and winter season, let's take time to reflect on our past clean water achievements as we continue to improve our water environment for our children, grandchildren, and ourselves.

I was recently talking with a long-time friend – a former classmate and fellow environmental engineer – who has done great work on groundwater remediation for over 25 years. He lamented that he is now challenged to see the benefits from his most recent work cleaning up

contaminated sites. "The most dangerous sites already have been remediated, many remaining sites pose a low risk, and creation of many new sites is thankfully not occurring," he said. What a wonderful statement!

When I began in environmental engineering 30 years ago, Love Canal was in the news as one of the most appalling environmental tragedies in American history. Times Beach was cited as one of our largest environmental disasters. Now, in 2016, we have witnessed 36 years of the Resource Conservation and Recovery Act (RCRA) and the hard work of environmental professionals to clean up and reduce waste. As a clean water community, let us reflect on this good news that some of our groundwater is cleaner and safer.

Similarly, I was reflecting on the state of water recovery, or what we used to call "wastewater treatment." It's now hard to believe that 40 years ago wastewater treatment plants in the US were considered adequate if they had primary treatment only; some advanced plants had secondary treatment and few tackled nutrient removal. Surface water quality was often poor and some US cities were dumping sludge in the ocean.

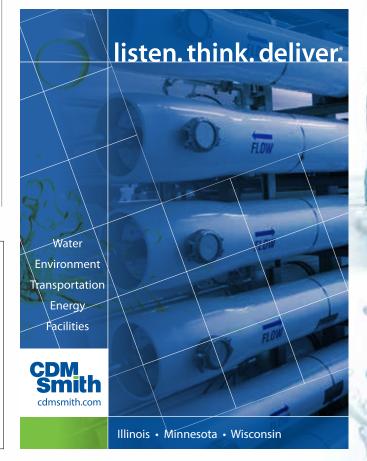


Now, in 2016, we have witnessed 32 years of the Clean Water Act (CWA) and the significant water quality improvement it was intended to foster. We now talk about reclaiming water for use, capturing nutrients, building net energy positive water recovery facilities, returning sturgeon to the Milwaukee River and considering contaminants of emerging concern, such as prescription drugs, antibiotic resistance genes and sanitizers. I would be much better off playing along Philadelphia's Tookany Creek today versus when I played in it in

1975 and saw raw waste flowing into the river!

The good news is that we can work together to develop and implement policies that really work. RCRA and CWA laws are great successes.

During this holiday and winter season, let's remember the good things we have done, and vow to do more of them.  $\Box$ 





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# TİTİTİTİTİTİ

# CSWEA Welcomes Our New Members

Jpdated on November 3, 2015

#### August 2015

Josh Koopman, Kapur Associates Duygu Celk Wade Kingsporn, Vermillion Community College Michael Johnson, HDR, Inc. Shivani Priyam, UIUC Ben Oyserman, UW-Madison Robert Brillhart, Foth

#### September 2015

Jose Perez, UW-Madison Lisa Sarau, Green Bay MSD Ming Hung Hsu Eric Fessler, FB Water Treatment, LLC Shantanu Agrawal, UIUC Saskia Versteeg, UIUC Christopher Buresh, Flint Hills Resources Andrew Sssennyonjo Nayung Kim Anjana Krishnan, UIUC Elaine Plinke Brett Bevers, UW-Milwaukee Jyotsna Shrestha, UIUC Paula Cedillo, UW-Millwaukee Justin Berrens, City of Waupaca Rachel Egly Armando Sanchez, UIUC Megan Fox, UIUC David Litwin, UIUC Jessica Steslow, UIUC

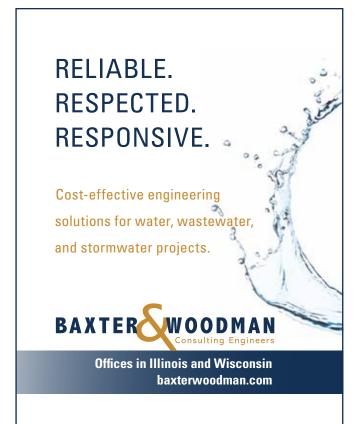
Luke Spalding
Amanda Caldwell-Jacques, UIUC
Wenjing Wu, UIUC
Allison Densler, UIUC
Chinelo Agbim
Qais Banihani
Marcy Knysz, Cardno
Sona Son, Microbial Discovery Group
Yang Liu
Omar Ali, UIUC
Matt Hayes
Denise Garcia, MWH Global

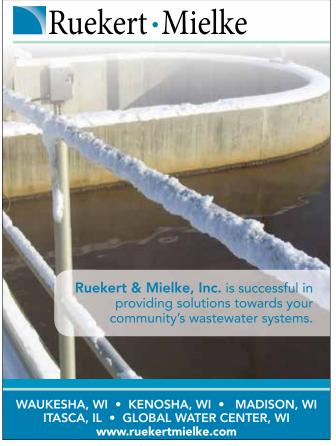
#### October 2015

Dominic Gattone, Strand Associates Steven Skinner, Village of New Richmond Alexander Lopez, Brown & Caldwell Gurmanpreet Bhupal, Brown & Caldwell Zeying Zhu, SIU Diana Byrne, UIUC Laura Haak Brian Pietz Joanne Rodriguez, Tremco Justin Conner Suzanne Fischer, City of Elk River, MN

#### November 2015

lan Peterson Curt Weber, UW-Whitewater Morgan Salo





#### **FEBRUARY 2016**

MN Section Innovative Operations Conference February 9, 2016 St. Cloud, MN

WI Section Government Affairs Seminar

February 25, 2016 Madison Marriott West Middleton, WI

#### **MARCH 2016**

WEF – Odors and Air Pollutants 2016 March 21-24, 2016 Milwaukee Convention Center, Milwaukee, WI

IL Section Government Affairs Seminar (w/IAWA)

March 23-24, 2016

Pres. Abraham Lincoln Hotel, Springfield, IL

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

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#### **APRIL 2016**

WEF - Residuals and Biosolids 2016

April 3-6, 2016

Milwaukee Convention Center, Milwaukee, WI

**Student Design Competition** 

April 18, 2016

Monona Terrace, Madison, WI

**Education Seminar** 

April 19, 2016

Monona Terrace, Madison, WI

#### **MAY 2016**

89th Annual Meeting

May 17-20, 2016

Monona Terrace, Madison, WI

#### **JUNE 2016**

WI Section Classic Collection System Seminar

June 9, 2016

Watertown, WI

#### **NOVEMBER 2016**

MN Section Conference on the Environment

November 9, 2016

Minneapolis Convention Center, Minneapolis, MN



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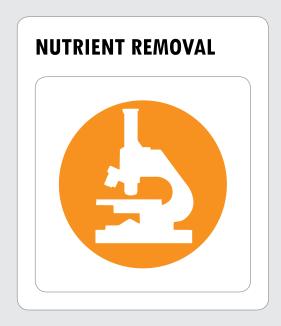
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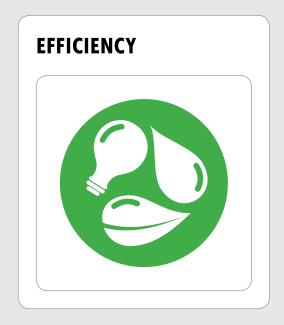
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