

CENTRAL STATES WATER

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

AUGUST SERVICE TRIP

Report



GLOBAL WATER
STEWARDSHIP

PLANT PROFILE:

Rochester Water Reclamation Plant



PLUS:

- CSWEA 2017 Buyers' Guide
- Downers Grove SD
 - A Net Energy Producing Facility
- UW – Platteville Student Design
- Brookfield HS
 - Stockholm Jr. Water Prize Entry



Water Environment
Federation
the water quality people™

Central States Water Environment Association
1021 Alexandra Blvd, Crystal Lake, IL 60014
ADDRESS SERVICE REQUESTED



FLEXIBILITY IS ONLY ONE ADVANTAGE OF OUR CLOSED LOOP REACTOR PROCESS

We have more than 50 years of experience in oxidation ditch technology and more than 2000 installations.

Lakeside's CLR process offers a variety of wastewater treatment options, including several operational modes, nitrogen and phosphorus removal, and an adaptable configuration, providing maximum flexibility with consistently high quality effluent. The CLR process is simple to operate and can be configured in several shapes, including the conventional racetrack, folded U-shape or concentric multichannel designs. Lakeside's staff delivers full service from initial concept through construction to plant operation. The result: reliable results with minimal operator attention and maintenance. When performance counts, count on the industry leader for more than 85 years!

Speak to one of our experts at **630.837.5640**, email us at **sales@lakeside-equipment.com** or visit **www.lakeside-equipment.com** for more product information.



Cleaner Water for a Brighter Future®



CLR Process Components

- Magna Rotors
- Velocity Control Baffles
- Rotor Covers
- Level Control Weirs
- E.A. Aerotor
- Process Monitoring and Control Systems



Be among the first to complete the
**UW-Madison Certificate in
 Water Reclamation**

Wastewater Treatment, Collection Systems, Resource Recovery

Strengthen your skills and your organization in this vital industry:

- Analyze and improve your processes and facilities
- Anticipate emerging challenges and opportunities
- Gain insights blending engineering, operations, regulations and management

Built upon UW-Madison's nationally-known continuing education courses in water and wastewater.



Learn more at: epd.wisc.edu/cswea

Leading-Edge Trenchless Solutions

We can handle
Pressure



Trenchless Water Main Rehabilitation

NORDIPIPE™ is the high quality solution for water main rehabilitation. This fully structural CIPP liner is NSF-61® Certified for potable water systems.



Trenchless Sewer Force Main Rehabilitation

NORDIFORCE™ is a specially designed CIPP liner for sewer force main rehabilitation. Both NORDIFORCE™ and NORDIPIPE™ can handle pressures up to 200 psi.



SEKISUI



www.sekisui-spr.com

1-866-627-7772



Reliable level. No contact.

The radar signals of the VEGAPULS WL 61 deliver reliable, accurate level measurement without contacting the liquid. Even through plastic and fiberglass, the VEGAPULS WL 61 outperforms the competition.

www.vega.com

   @vega_americas
1-800-FOR-LEVEL

Looking Forward **VEGA**

FEATURES

Global Water Stewardship – August Trip Update	13
Plant Profile: Rochester Water Reclamation Plant	20
Downers Grove SD – A Net Energy Producing Facility	27
UW - Platteville Student Design – Dominical, Costa Rica	33
SJWP: An Approach to Water and Wastewater Treatment with Solar-power	40
GWS Corporate Donor Spotlight – MSA Professional Services	43
2017 Buyers' Guide	56

DEPARTMENTS

Messages

President's Message	7
WEF Delegates' Message	9

CSWEA News

CSX '17	19
Call for Awards 91st Annual Meeting	46
Call for Abstracts 91st Annual Meeting	50
Operations Challenge	53
Calendar of Events	68
New Members	69

Section News

Illinois Chair Message	65
Wisconsin Chair Message	66
Minnesota Chair Message	67

Published by:



Tel: (866) 985-9780 Fax: (866) 985-9799
www.kelmanonline.com

Managing Editor: Cheryl Parisien, cheryl@kelman.ca
Design/Layout: Jackie Magat
Marketing Manager: Darrell Harris, darrell@kelman.ca
Advertising Co-ordinator: Stefanie Hagidiakow
Federal tax# 23-7378788

©2017 Craig Kelman & Associates Ltd.
All rights reserved. The contents of this publication, which does not necessarily reflect the opinion of the publisher or the association, may not be reproduced by any means, in whole or in part, without the prior written consent of the publisher.

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, mhaque@cswea.org

Send undeliverable addresses to: CSWEA, 1021 Alexandra Blvd, Crystal Lake, Illinois 60014

Follow us on Twitter @cswea Link up with CSWEA on LinkedIn



President

Sue Baert
Wheaton Sanitary District
P: 630-668-1515
baert@wsd.dst.il.us

1st Vice President

David Arnott
Ruekert & Mielke, Inc.
P: 262-542-5733
darnott@ruekert-mielke.com

2nd Vice President

Doug Henrichsen
Brown and Caldwell
P: 651-468-2077
dhenrichsen@brwnclald.com

Treasurer

Beth Vogt
Fox River WRD
P: 847-742-2068
bvogt@frwrld.com

Immediate Past President

Patricia Oates
Metropolitan Council
P: 651-602-4915
patricia.oates@metc.state.mn.us

WEF Delegate '17

Doug Henrichsen
Brown and Caldwell
P: 651-468-2077
dhenrichsen@brwnclald.com

WEF Delegate '19

Eric Lynne
Donohue & Associates, Inc.
P: 920-803-7375
elynne@donohue-associates.com

PWO Representative '19

Chris Lefebvre
Stevens Point WWTP
P: 715-345-5262
clefebvre@stevenspoint.com

YP Representative '18

Anna Munson
Black & Veatch
P: 952-896-0500
munsona@bv.com

Illinois State Section Trustee '19

Derek Wold
Baxter & Woodman
P: 708-478-2090
dwold@baxterwoodman.com

Minnesota State Section Trustee '18

Tracy Hodel
City of St. Cloud
P: 320-650--2953
tracy.hodel@ci.stcloud.mn.us

Wisconsin State Section Trustee '19

Daniel Zitomer
Marquette University
P: 414-288- 5733
daniel.zitomer@marquette.edu

Director

Amy Haque
CSWEA
P: 855-692-7932
ahaque@cswea.org

IT MATTERS.

To us, your project isn't a job - it's an opportunity to make a positive impact, protect future generations, and ensure the vitality of where we live and work. **It matters.**



Providing engineering and related services to help clients achieve success.

WATER ENGINEERING | CIVIL ENGINEERING | GIS | MUNICIPAL FINANCIAL SERVICES | ASSET MANAGEMENT
INSTRUMENTATION & CONTROLS | ELECTRICAL ENGINEERING | STRUCTURAL ENGINEERING | COMMUNICATION SERVICES

THINK BIG. GO BEYOND.



Advanced Engineering and Environmental Services, Inc.

Minnesota Offices: Maple Grove, Moorhead, Lake of the Woods

www.ae2s.com

Reflections On the Job So Far

By Sue Baert



I have been tasked with writing a thousand-word article. I sit here staring at the page thinking this shouldn't be too difficult, as I love to talk! Turns out I'm wrong about that. So I have decided to review the work projects and organizations that I have been involved with since my induction in May.

First of all, I was dealing with the Central Database Exchange. This is the program where all state and federal reports will one day be submitted – we switched from the NETDMR reporting. The help desk hotline was my salvation!

I also attended many interesting meetings. At the Illinois Association of Wastewater Agencies (IAWA) meeting I learned about the advances in wastewater treatment using Aerobic Granular Sludge and Lessons learned from the Detroit Experience.

The IAWA meeting was on Safety Pays. The implementation of a Safety Management System to reduce costs and Water Quality Markets for Illinois was discussed.

I attended the DuPage River Salt Creek Workgroup (DRSCW) meeting where updates were given on the DRSCW's development of a Nutrient Trading Framework. We also received CMAP's update on the Lower Salt Creek Watershed Based plan. A walking tour was given at the Preserve at Oak Meadows, IL. On two occasions I've attended this stormwater tour and twice it has rained! How apt.

I also had the opportunity to lead the Central States Exchange (CSX) of Ideas. I wrote an article for this edition on that very experience, so find out more there... I'm tempting you with a find-and-see challenge!

Secondly, the Wheaton Sanitary District (WSD) is in final design with Trotter and Associates, Inc. to replace eight sand filters with Krueger disk filters. We have received approval for construction and a State Revolving Fund (SRF) loan for this project. Work commences this fall by contractor JJH (Henderson) and will be complete by next summer 2018.

WSD is in preliminary design with Carollo Engineers, Inc. to replace our existing chlorine/sulfur dioxide disinfection system into Ultra Violet Disinfection. We will be seeking a construction permit and State Revolving Fund loan. We expect this project to be complete by 2019.

WSD hired a third-party independent consultant to review our job descriptions and pay grades/salaries. What an enlightening process; there's such a vast difference in how someone looks at rules/procedures as a non-exempt employee vs. an exempt upper management employee. When a company is only 25-30 people, it's important not to become too narrow in your business assessment. By that I mean using the employees you currently have to make the pay grades, not actual qualifications, education, and certifications.

WSD has two employees retiring. One is leaving us in 2018 after 46 years of experience and one in 2019 with 40 years of experience. We have conducted the hiring and interviewing process and found two quality individuals to help fill the void these retirements will cause.

WSD's National Pollutant Discharge Elimination system (NPDES) permit was renewed August 1, 2016. WSD sits in

an affluent area within Wheaton and the houses/town homes come right to our fence line. On one of the other sides we also have a ball field, tennis courts, and park. I'm guessing you can see where this is going – odors and a very engaged group of neighbors keep us on our toes! Several years ago in an effort to be neighborly we stopped using our sludge beds and constructed a storage barn for our biosolids. We also keep a very extensive tree population on plant site. We use hypochlorite at the head of the treatment works, several different Ecosorb units, plus a Phoenix unit that uses carbon canisters to remove H₂S (hydrogen sulfide gas). We felt these measures did a great job, but being neighborly again we opted to contract Trotter and Associates to do a plant-wide air quality study with actual bagged air samples tested at an outside lab. All this has led us to reexamine our headworks building. We then contracted Applied Technologies Inc. to look at the headworks building and their recommendation was for a different air exchange pattern thus a new HVAC system and a Biorem system for the mercaptans and hydrogen sulfide removal.

I'll conclude this update by directing you to please refer to the Central States website, www.cswea.org for a variety of educational seminars throughout the three states. Central States and Illinois Water Environmental Associations meet and greet is Sunday October 1 at 6:00 p.m., at WEFTEC in Chicago, IL at the Hilton. And please all come to next year's Annual Meeting at The Drury Lane in Oakbrook Terrace, IL from May 14-16, 2018. [CS](#)

EVERYTHING COULD USE AN UPGRADE.



Well...not *everything*, but your plant could!

AW can do just about anything for your plant, from installs to maintenance, to upgrades and warranties. AW has the fix.

Snap the QR code, go to www.aerationworks.com
or ask for AW at (573)-474-9456



Transitions

By Doug Henrichsen, Eric Lynne, and Mark Eddington



Eric Lynne



Doug Henrichsen

Doug Henrichsen will rotate off of the WEF House of Delegates (HOD) after the first half of the HOD meeting on September 30, 2017 in Chicago during WEFTEC. Doug has served CSWEA and WEF in one role or another throughout his tenure in Minnesota. He has served in many capacities on the Executive Committee, including Treasurer and MN Section Trustee. During his time as a HOD member, Doug has served on the HOD Audit and Budget committees, as well as the Leadership Development, Value of Water, and Stormwater Work Groups. Going forward, Doug will continue to serve on the CSWEA Executive Committee as Second Vice President.

Delegate Eric Lynne will continue to serve CSWEA and WEF as a HOD member until 2019. Incoming WEF Delegate Mark Eddington's term will begin the second half of the HOD meeting in Chicago, as he will replace Doug on the HOD as well as on the CSWEA Executive Committee. Mark's past experience and service to Central States are sure to guide him as part of the delegation that represents CSWEA members on the House of Delegates.

UPCOMING WEF HOUSE OF DELEGATES MEETING

The WEF HOD will hold their annual meeting on Saturday, September 30, 2017 in Chicago during WEFTEC. CSWEA's outgoing WEF Delegate Doug Henrichsen, Delegate Eric Lynne, and incoming Delegate Mark Eddington will attend. In the morning, outgoing Speaker of the House Howard Carter, from the New England WEA, will chair the HOD meeting with reports from all committees and workgroups. Table Talk discussions between

"At CSWEA, we are doing a super job towards connecting, promoting, increasing, and providing the value of water!"

various MAs will also be conducted to allow for better communication on specific ideas. The morning session will also include confirmation of the incoming WEF President, Board of Trustees, and Delegates. In the afternoon, the incoming Speaker of the House, Aimee Killeen from the Louisiana WEA, will lead sessions covering the WEF Business and Committee Meetings to set the course for the coming year.

The HOD Standing Committees for 2017-18 are anticipated to be:

- Budget
- Outreach
- Nominations
- Steering

Eric and Mark will each serve on one of these standing committees. Various Work Groups will also be formed, each with various topics to address.

A WEF Leaders Reception will then occur for Delegates to attend and network in the evening. Take this time to meet

your leaders including another local representative, President-elect Thomas Kunetz of MWRDGC.

At Central States Exchange (CSX) a few of the WEFMAX exchange items, gleamed by Doug, Eric, and Mohammed, were deemed worthy of repeating in this issue.

At CSWEA, we are doing a super job towards connecting, promoting, increasing, and providing the value of water! When asked by WEF, what help we need, it is somewhat of a struggle as our organization has already addressed many of the key issues that WEF's other MAs are struggling to contend with.

GENERAL WEF AND HOUSE OF DELEGATES INFORMATION UPDATE:

- WEF has come a long way on its strategic planning journey as it develops a three-year business plan.

This approach provides for predictable planning, budgeting, and tracking, giving the board and staff the necessary time to consider data and trends, seek input, and to plan ahead. This concept also provides an actionable reference for our staff to use throughout the year, as well as a broad overview of the business climate at WEF.

- There are four Delegate at-Large positions opening for nominations. If anyone is interested in applying, contact one of our current Delegates Doug, Eric, or Mark for more info. Tracy Ekola currently holds one of the current at-large positions; contact her for feedback on applying for the position.
- WEF is developing a new dues strategy. The result increases communication to avoid previous experiences of unforeseen price-hikes that are offensive to some. More information on the dues program will be shared in future reports when finalized.
- WEF is working with CSWEA to offer free memberships to non-members from our three states who attend WEFTEC 2017. Details will be distributed on the free MA-Only membership opportunities offered to WEFTEC attendees. Current plans limit offerings to only true non-members; lapsed memberships would not qualify. Although this is a non-issue for our current members, do not forget that anyone can join the MA-Only status with CSWEA for only \$30 if the full WEF membership is not in the budget; this is a unique feature that not all MAs offer.

PUBLIC EDUCATION AND OUTREACH:

This topic was a focus area requested by the membership. So much so that Mohammed, Eric, and Doug each were asked to share our CSWEA successes with the Global Water Stewardship program. Thus far, interest in our sister organization has been high. Other noteworthy activity in the organization includes:

- WEF's Students and Young Professionals Committee, specifically the Community Service Project subcommittee, is developing a Standard Operating Procedure for their annual WEFTEC event. Aside from instilling a level of sustainability to the eternal transfer of knowledge, the group hopes that this document will be something that can be used to guide MAs in the development of local (likely smaller) community service projects.
- New York WEA shared their Messaging video (viewable here: <https://www.youtube.com/watch?v=HtCgNv00fGM>) that they made for profiling plants and services provided and less about the ever-present need for funding. This concept could supplement facilities that have seen a decline in K-12 field trips.

MA EXCHANGE TIDBITS:

As mentioned above, the concept of WEFMAX is to disseminate those tidbits, things that other Associations are doing that could make our organization better. The below is a summarized list of relevant tidbits from the Cincinnati WEFMAX, so if something piques your interest – let's work together to put it in motion!

- A growing number of MAs are developing an Annual Sponsorship Program; which some have included a points system for event related items like registrations. New England WEA has had a system like this already, but noted theirs does not extend to registrations, but may start to look into this. Ohio noted that they now provide a thank-you letter to all sponsors. This is a focus item for CSWEA to implement for 2018.
- A growing trend in association topics revolves around young professionals. Some MAs are starting to send their YP Chair to WEFMAX (CSWEA funds attendance to the YP Summit) for that first-person engagement with YPs.
- To improve Student Chapter relations, consider devoting a section of the magazine for them and allow the university professor to provide relevant content.
- A growing number of Associations are compiling an MA Calendar. Typically, these consist of a photo competition with a brief plant profile.
- MAs noted difficulty in getting responses to surveys, specifically on their own membership. Depending on the data requested, significant prizes were offered as a raffle to anyone who completed the survey. A similar concept, to boost readership of the MA magazine, involves a hidden member ID could be inserted to the text of a random article, which if that member properly claims it, could be offered a prize.
- To support the women in our industry, some associations held (solely or partnered with other groups) a Women's Leadership Luncheon, which acknowledges a Woman of the Year and offer a half-day set of presentations followed by a wine social.
- The Pacific Northwest CWA noted having a well running Student Mentorship Program and even developed an MA level guide. Similarly, New Jersey WEA indicated success at attracting YP attendance with special YP tract sessions where the YPs jointly develop and present their talk with a senior/retired professional.

Industrial & Environmental Concepts

Pond & Tank Covers

- Gas Collection
- Odor Control
- Algae/TSS Control
- Clarifier Covers
- Heat Retention/Improve Nitrification



Call IEC 952-829-0731

See our website www.ieccovers.com

- Looking to increase premium vendor offerings, Utah WEA now offers sponsor videos to be displayed during lunch.
- As part of Public Outreach and connecting with high school students, and retaining that connection through college, New York WEA has developed a strong scholarship program. The program is very successful and has a goal to distribute \$100,000 in 2017.

WEF FLY-IN:

CSWEA does not explicitly send a representative to the Fly-In; however, our State Sections and major utilities members do. Discussion points at WEFMAX indicate that CSWEA could do a better job at coordinating and encouraging our members to improve this effort.

- WEF has developed a packet for Fly-In attendees to increase the effectiveness of everyone's visits with legislators.
- Have a unified voice. Practice. Do your homework.
- Be a resource. Use the JFK approach and change the dialogue from asking

for support to providing support. As how we can help answer any questions they have with water related topics. This should lead to a better relationship that extends year-round, beyond the Fly-In week.

- Given the Flint, MI crisis, many lead service items (drinking fountains/sinks) in D.C. government buildings were labeled "DO NOT DRINK" with adjacent Culligan water coolers. This could be used as a topic to initiate discussion.
- Many politicians focus on job growth. Take the officials (Local/State/National) on a tour of the actual infrastructure including spots of overflows and show the need for support. If asked "How many jobs does the water industry support?": Respond powerfully with "All of them" – as there is a way to support this claim from multiple angles.
- Plan the Fly-In as a committee. Start planning after election and try to send multiple MA representatives if possible. Note, NEWEA sent 37 people from

6 states and host a Fly-In 101 for new people many of which pay the way themselves. If possible, they bring a town manager to share a success story of funding.

- Sign up as "Water Advocate" on WEF.com/Advocacy to get weekly updates of This Week in Washington.
- Consider a State legislature level "Drive-In" (instead of Fly-In) for local officials.
- Lastly, remember – as a non-profit org. we are not lobbyists, instead are advocating for an issue, not a candidate.

WEF/WE&RF LIFT AFFILIATE

CSWEA is still pursuing MA Affiliate membership status. The membership will require CSWEA to pay a subscription fee based on the number of log-ins. We are currently still working through WE&RF's application process. Contact us if you are interested in assisting CSWEA deploy our access to the membership. [CS](#)

We bring water back to life.



Thickening



Screening



Grit Removal



Clarification



DAF



Trickling Filters

Kusters Water has built a reputation for providing quality, dependable products with the latest in water and wastewater treatment innovation. See how our solutions are made for longevity – and your budget.

[BIOSOLIDS](#) | [HEADWORKS](#) | [THICKENING](#) | [CLARIFICATION](#) | [BIOLOGICAL](#) | [ODOR CONTROL](#)



SCAN FOR
PRODUCT LINE



Call 1-800-264-7005 | kusterswater.com

BIOGAS CONDITIONING SYSTEMS



Sheboygan Regional WWTF, Sheboygan, WI

- Biogas to Vehicle Fuel Systems
- Hydrogen Sulfide Removal
- Capstone Turbine Distributor
- Compressor Skids
- Moisture Removal
- Siloxane Removal
- Blower Skids

563-585-0967
www.unisonsolutions.com



Leaders in Biogas Technology

EXPERTS in all things WATER and WASTEWATER.



Consider the benefits of full design and construction responsibility by experienced tank specialists capable of handling any water and wastewater challenge. At DN Tanks, we are the experts in design and construction of all types of storage and process tanks ranging from the most basic storage tank to the most complex process tanks.

Contact us for all of your water and wastewater storage needs.

Jerry Myers, Regional Manager | 847.778.8098
jerry.myers@dntanks.com | www.dntanks.com

Chemicals, Equipment and Service for Safe, Clean Water



www.hawkinsinc.com

Water Treatment

- Potable Water
- Raw Water Clarification
- Swimming Pools
- Boiler & Cooling Systems
- Wastewater
- Waste De-Watering
- Waste Settling Aids
- Collection Systems

Equipment:

- Chemical Injection Pumps
- Control and Monitoring Systems
- Chlorination Control Systems
- Chemical Feed Equipment

Superior, WI
715-392-5121

St. Paul, MN
651-730-1115

Fond du Lac, WI
920-923-1850

Centralia, IL
618-545-3775

Havana, IL
309-543-2152

Peotone, IL
708-258-3797

Elizabeth Bohne,
GWS Marketing Chair



GLOBAL WATER
STEWARDSHIP

AUGUST SERVICE TRIP *Report*

By Elizabeth Bohne

Another Midwest summer is wrapping up. For most, August means trying to embrace the final days of sunshine and warmth. For GWS, it means travel time! The annual August GWS trip is crucial for our group's progress. Each year we get the opportunity to travel down to Costa Rica and meet with government and community members face-to-face, as well as see the grounds for the plants we are designing. It's also a great time to develop relationships with the group members who we typically work with remotely, and engage with the student design winners. This year's travel group included GWS Executive Director Mohammed Haque

and his son Zaid, GWS International Programs chair Manual De Los Santos and his son Diego, GWS Marketing/PR chair Liz Bohne, GWS Volunteers Mike Holland and Mike Pepin, and student design competition members Guissel Davila, Karissa Brunette, and Lila Johnson.

This year's trip was a BUSY one – as usual. We had a lot to accomplish in one short week. A ton of planning went into making the trip this year a success, including almost daily conference calls leading up to the trip and hours of volunteer hours contributed from many of our members, including many who weren't able to travel.

The trip this year had four main goals. The second was to gather the data

necessary for the 2018 student design competition problem statement in the Palmar Sur community. The third was to construct a bio-garden at a Pre-school in Uvita to treat grey water and teach children about wastewater. The fourth was to continue our education campaign in the communities. The first was to visit and get a tour of the 64 MGD Los Tajos plant in San Jose. Keep reading for an update on each of these goals.

LOS TAJOS

On the first morning of our trip, several of our group got to visit the Los Tajos plant in San Jose. The 68 MGD plant was constructed two years ago and is a first-class facility that includes CHP,

Los Tajos



Palmar Sur



significant odor control, centrifuge-based dewatering, and full SCADA. It was constructed for \$45 million and was the largest wastewater project in the country.

Manuel and Diego de los Santos, Mike Pepin as well as Mohammed and Zaid Haque got a Saturday morning tour of the facility by the AyA staff. "It was really great to see how impressive the Los Tajos plant is. It's really a top-notch facility that has a unique design because it is located at an old quarry. It has above-ground structures due to bedrock and extensive odor control due to the requirements of the lending institution. I was impressed that they had combined heat and power recovery and a very robust SCADA. I think with the addition of secondary treatment, this is going to be as impressive a treatment plant as any we have in the United States," said Mohammed Haque.

A big thank-you to the AyA staff to come in on their off day to give our group a tour.

PALMAR SUR

Palmar Sur is a community about 40 km south of Dominical, the location of the 2017 Student Design Competition. It has a larger population than the communities we have previously worked with, and is not as dependent on tourism as Bahia Ballena or Dominical. It is unique in that a collection system is already in place. Currently, the majority of homes and businesses in the community are connected to this system. A few of the homes have septic systems that are used as a type of preliminary treatment and overflow is hooked up to the system. The collection system carries untreated wastewater and septic overflows to a discharge point into the Sierpe River. The ASADA (local water utility) is very eager to implement more advanced wastewater treatment. They already have land which has been reserved for a treatment system, and are on AyA's priority list for communities. Now they need help designing a system that will fit their specific constraints, and training the ASADA to operate and maintain the system. The ASADA shared all of their digital data regarding the existing collection system, water billing data, and surveys of the sites they have selected, and ideas about what they believe the future plant should look like. We have everything we need to get working on this one.

It should be a great project for the student design competition, as well as for GWS. One challenge we have had that has slowed our progress in other communities is land zoning and acquisition, as well as lack of reliable data. These do not appear to be an issue with Palmar Sur, however, each project has its own unique challenges that come with the territory when working internationally. We're excited to get moving on this one!

BIOGARDEN

Something new we started with this trip is the construction of a biogarden. A biogarden uses wastewater, in this case grey water, for plants to grow. There is no soil, so plants will take up the nutrients from the water. It is a low cost and low maintenance way to treat wastewater that also provides an aesthetic and educational component.

We plan to continue constructing one each year in areas that may be difficult to connect to the future collection system, such as beach bathrooms, or locations where there is an educational benefit, including schools and hotels. This year we constructed one at a newly constructed preschool. This project presented some unique challenges for the group that allowed everyone to get involved and get their hands dirty.

The majority of the design was done before our arrival by GWS members using data provided by the preschool owner and Amy Work, our in-country contact. However, without visiting the site or having access to as-built drawings, it was difficult to finalize piping plans and exact layouts. We worked with the local contractor that constructed the pre-school to finalize the design and help with construction. One major obstacle we faced was that the area was too small to get any major equipment in without disturbing the area around it. This meant shovels, pick-axes, and wheelbarrows for us! It was NOT easy work in 90-degree heat and 100% humidity, but with the help of a few locals, we were able to get everything done. It was a great team-building experience for us and finished with beautiful results.

EDUCATION

Another important aspect of the August trip is the education initiative. This year we visited schools in Piedras Blancas, the location of the 2015 project, and




Biogarden



Palmar Sur. In both schools we worked with students in third grade through seventh grade. We had discussions with them about engineering and what an engineer was. Many had an idea of what an engineer does, but they had no idea what environmental engineering was! In Costa Rica, environmental conservation is a big part of the culture, so they were excited to learn that there was a way they could make this into a career. We also taught them about the water cycle. Many had learned about the water cycle in school, but had never thought about the human impact on the water cycle. We asked them how they use water and what they thought happened to the water when they were done using it. Many said, "It went into the pipes!" and did not know what happened after that. They had never considered the impact that they were having. We explained what wastewater treatment is, and why it's important and then did a fun experiment where students created their own wastewater using tea leaves, glitter, and aquarium rocks. Then they allowed for settling, to remove larger particles, aeration (using effervescent salts) to demonstrate the biological process, and filtration with a coffee filter. We had them compare the treated water with their original "wastewater" and showed them the impact that dumping the untreated wastewater could have on marine life. They had a great time with the experiment! This is one of our favorite parts of the trip because they students are the future of these communities. It's so much fun, and it's great to think we could help shape how these children think about water and wastewater.



Overall, it was a fantastic trip! We had a great time and even had a little bit of free time at the end to go on a river tour of the Terraba River and try out surfing on the world famous surf beaches! As we continue to grow and move forward with our projects, having feet on the ground year round has been crucial. A big shout-out to Amy Work and James Drews, our two local contacts who put in countless hours and efforts to organize

everything that made this trip go smoothly and continue to push the projects forward when we return to the States. Thank you so much to those who have sponsored and supported us in other ways, your contributions are making big changes to the wastewater industry in Costa Rica. For more information check us out at www.globalwaterstewardship.org or on Facebook, LinkedIn, Instagram, and Twitter (@H2OStewards). Pura Vida! 

Solutions for the Complete Water Cycle

1-800-879-3677
fluencecorp.com



fluence

Value from Water

Revenue collector.
Water loss manager.
Low flow detector.
Consumption monitor.
Game changer.

That also happens to be the most accurate water meter.

Learn more at go.sensus.com/cstm/omni.

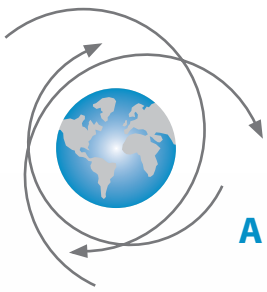


Is all grit created equal?

Conventional design guidelines specify that treatment plants target removal of solids larger than 210 μm , but wastewater grit can be as small as 50 μm . If you're not removing fine grit then you're paying for it in abrasion damage, clogging and increased maintenance.

Challenge convention: visit hydro-int.com
or call 866.615.8130





CHEMTRADE

A leading market expert in Phosphorous removal

Aluminum Sulfate Polyaluminum Chloride Aluminum Chlorohydrate Ferric Sulfate

Superior phosphorous removal chemicals that:

- Achieve low phosphorus limits
- Enhance efficiency
- Reduce alkali consumption
- Reduce corrosion and staining
- Minimize solids formation
- Improve settling

1-800-255-7589

www.chemtradelogistics.com

water@chemtradelogistics.com



Responsible Care®
Our commitment to sustainability



CSX'17

News

BY SUE BAERT

This year's CSX (Central States Exchange – modeled after WEF's WEFMax) was held on July 20–21 at the Kalahari Resort in Wisconsin Dells.

CSWEA members, section chairs, and the executive team reported and exchanged ideas on what is working in the education and service of our members. It was an added pleasure to meet everyone's family. As my children are in their late teens and early 20s, watching new parents with extremely active toddlers is a beautiful and entertaining sight. I thank you!

Two areas of focus this year were the three state section exchanges (Illinois, Wisconsin, and Minnesota) and the shortening of the annual meeting. The three section chairs spoke on the annual activities they provide, their structure, and fiscal soundness. With widespread coverage of committees (10–13 per state), a focus on consolidating a few of the committees was discussed. This would enable a more in depth seminar, as well as potential for pairing with neighboring states for joint activities. Well done to Zach, Jay, and Tim.

Our fearless leaders, "Haque and Associates," led the discussion on the possibility of revamping the Annual Meeting schedule. Ideas were floated to shorten the event by a day, making the first day more tech and workshop loaded, while still offering golf and the meet and greet that evening.




It was suggested the second day be restructured to include a 6:00 a.m.

5K/yoga choice, no opening session, 8:00 a.m. start to the technical sessions, and a designated one-hour exhibitors-only slot followed by the 7S, Golden manhole meetings, and the Association Luncheon. The day would be rounded off with our great Awards Banquet.

The third day would include the State Section breakfast, technical sessions, and one-hour exhibits with a vendor showcase, and the ethics technical program. If you're curious to see how things work out, make sure you come to the Annual Meeting at Drury Lane, in Oakbrook IL, May 14-16, 2018. **CS**


IBC Tote Scales™ & Drumm-Scales™:

STOP WASTING EXPENSIVE POLYMER!

- ◆ Accurately monitor amount of polymer being fed
- ◆ Maximize solids yield with minimal polymer use
- ◆ Feed Rate alarms warn when off target

For more information,
Call (925) 686-6700 or
visit www.forceflowscales.com



FORCE FLOW

CHECK. CONTROL. COMPLY.

Rochester Water Reclamation Plant Rochester, Minnesota



GENERAL BACKGROUND

The Rochester Water Reclamation Plant (WRP) serves a population of approximately 110,000 including residential, commercial, and industrial customers treating an average daily flow of 14 million gallons per day (MGD). The WRP has 31 staff members that are responsible for the operation and maintenance of the water reclamation plant and four remote lift stations. The plant is staffed 24 hours per day, seven days per week, 365 days a year. The Rochester Water Reclamation Department currently operates and maintains four lift stations within the city. The collection system is maintained by another division of the city.

Headworks:

Influent enters the plant via an 84-inch gravity sewer where it flows through trash racks to collect large debris. Five centrifugal pumps lift the flow 65 feet to the headworks and from here on, the liquid stream flows entirely by gravity through the entire plant. Six millimeter fine screens remove any debris before a vortex grit drops out the heavier grit. From here, the flow is directed to either the High Purity Oxygen (HPO) Plant, the Aeration Basin Complex (ABC) Plant, or the equalization basin. The equalization basin is considered part of headworks and is a storage tank that allows flow to be stored during high flow periods and released during low flows. A more steady flow reduces strain on the different processes at the plant.

HPO Plant:

The HPO plant divides the activated sludge concept into two stages. The first stage is made up of two trains that operate in parallel with each train using three 40 hp mixers that mix and aerate the MLSS. The first stage achieves approximately 95% removal of the biochemical oxygen



Aerial view



Fine screens



Primary clarifier

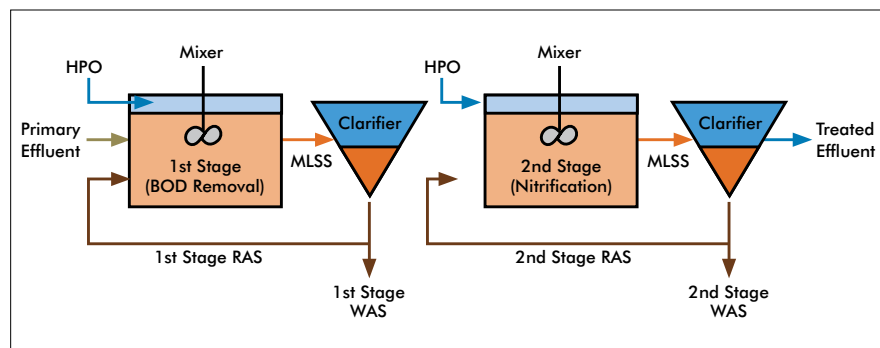


Figure 2: HPO activated sludge

demand (BOD), or organic material. This stage has a solid retention time of less than two days. Solids retention time is a measure of how long a typical microorganism is in the system.

The second stage of the HPO plant is made up of three trains operated in parallel, each containing three 30 hp mixers that mix and aerate the MLSS. This stage is responsible for nitrification or the conversion of ammonia to nitrate. The second stage has a typical sludge age of 60 days and removes approximately 99% of ammonia. Figure 2 shows the HPO process schematic.

Oxygen is supplied to the HPO aeration tanks by a 20 ton per day cryogenic oxygen plant that produces high purity oxygen. High purity oxygen provides increased oxygen transfer efficiency because the feed air is 95% oxygen compared to conventional aeration which is only 21% oxygen. The aeration tanks are covered and the high purity oxygen is confined to the layer between the liquid and tank cover. Mixers agitate the liquid to encourage oxygen transfer from the confined air space to the liquid.

ABC Plant:

The ABC Plant is a conventional air activated sludge plant and consists of two parallel aeration basins. The basin is divided into four different zones. Zone 1 is where primary effluent and RAS is combined to form the MLSS. Zone 1 is unaerated and can be operated as an anaerobic (no oxygen available) zone or as an anoxic (oxygen available in the form of nitrate) zone. Zone 1 also can receive an internal recycle stream from Zone 4 if an anoxic environment is desired. A mixer is used to keep Zone 1 mixed.

Zone 2 is a swing zone and can be operated in an anaerobic, anoxic, or aerobic mode. If operated in anoxic or anaerobic, a mixer will be used to ensure a homogenous environment. If operated aerobically, fine bubble diffusers will deliver air for oxygen transfer and mixing. The internal recycle from Zone 4 can also be directed to this zone to create the anoxic environment.

Zone 3 and 4 are always aerobic. Fine bubble diffusers are used to deliver oxygen and create a well-mixed environment. MLSS from Zone 4 can be internal recycled to create anoxic environments in Zone 1 or Zone 2. Figure 3 shows a general layout of the ABC activated sludge system.

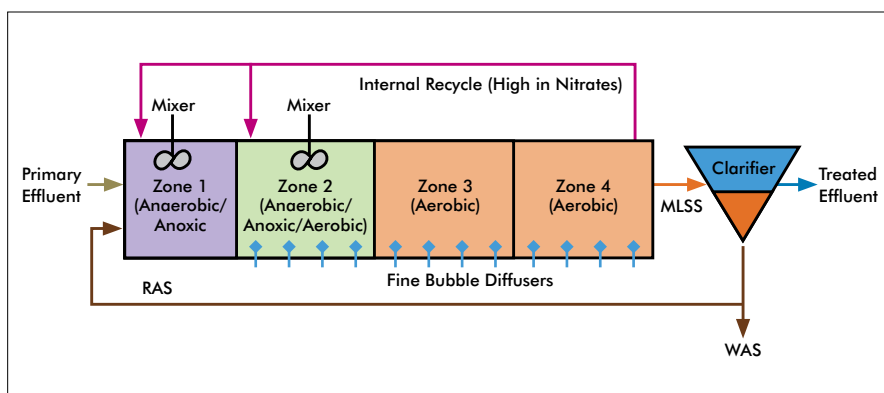


Figure 3: ABC activated sludge

Planning, Design and Construction Engineering Services for Municipal Infrastructure

Trotter and Associates, Inc. has consistently implemented innovative, practical solutions for communities since 1999.

Wastewater Services:

- Facility Planning & Rate Analysis
- Wastewater Treatment
 - Nutrient Removal
 - Wet Weather Flow Treatment
 - Biosolids Management
- Collection Systems
 - Infiltration and Inflow Analysis
 - Capacity Management, Operation and Maintenance
 - Rehabilitation Programs

St. Charles, IL • Fox Lake, IL
630.587.0470 • www.trotter-inc.com

Experienced Professionals Better Solutions

Air is supplied by one of three blowers that deliver conventional air (21% oxygen) to the zones that are operating in aerobic mode. A solids retention time of approximately 15 days allow for BOD removal and nitrification with respective removal rates of 98% and 99%. Different ABC operation modes and the corresponding effects on pollutant removal is discussed further in the ABC Configuration paragraph.

The Rochester Water Reclamation Plant uses several advanced treatment technologies including biological

nutrient removal. Both plants perform nitrification and the ABC plant has the ability for denitrification (or the conversion of nitrates to nitrogen gas) and biological phosphorous removal.

ABC CONFIGURATIONS

AO Process (Anaerobic/Aerobic):

Zone 1 and potential Zone 2 are operated anaerobically to encourage growth of phosphorous accumulating organisms (PAOs) while Zones 3 and 4 are aerobic. The aerobic portions of the tank remove BOD and nitrify any ammonia. This mode

may also be considered conventional activated sludge with nitrification if no PAOs accumulate. Even if PAOs are not present, Zone 1 (anaerobic) can be used as a selector to limit growth of filamentous bacteria which can result in poor settling sludge in the clarifiers.

A2O Process

(Anaerobic/Anoxic/Aerobic):

Zone 1 is anaerobic and will encourage growth of PAOs, Zone 2 is anoxic using the internal recycle to send nitrates here for denitrification or conversion of nitrates to nitrogen gas, Zones 3 and 4 are used for BOD removal and nitrification.

MLE (Modified Ludzack Ettinger):

Zone 1 and possible Zone 2 is anoxic and will denitrify nitrates that are from the internal recycle. Zone 2 is either aerobic or anoxic depending on the level of denitrification desired. The aerobic zones (Zones 3, 4, and possible 2) will be used for BOD removal and nitrification.

Chemical for Phosphorous Removal:

Both the HPO plant and ABC plants inject ferric chloride into the primary clarifiers to assist in precipitation of phosphorous. Both plants also inject alum into the final clarifier to precipitate any remaining phosphorous. An anionic polymer is combined with the alum to improve settling characteristics of the sludge.

Chlorination/Dechlorination:

Flow from both the HPO plant and ABC plant are combined prior to chlorination. Chlorine gas is added to the process flow between April and October and is allowed several hours of contact time. Sodium bisulfite is used to neutralize any residual chlorine to prevent any negative impacts to downstream aquatic life.

Solids Handling:

Waste activated sludge from both stages in the HPO plant and the ABC plant are thickened on the gravity belt thickeners (GBTs) prior to being combined with primary sludge in the blend tank. Blended sludge is anaerobically digested in a single stage digester with a detention time of approximately 30 days that produces a methane rich gas byproduct. The digested sludge is thickened using GBTs to reduce the volume before being stored and ultimately being land applied seasonally.



Cryo plant



ABC diffusers

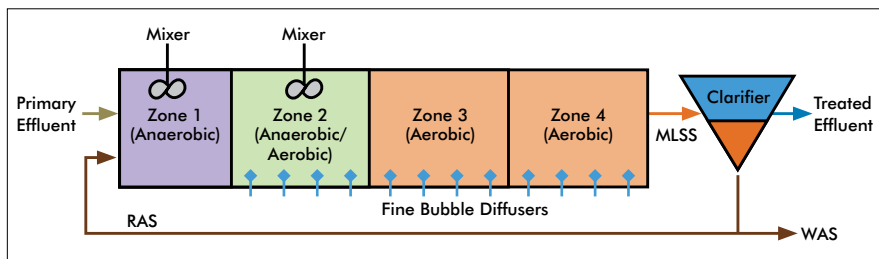


Figure 4

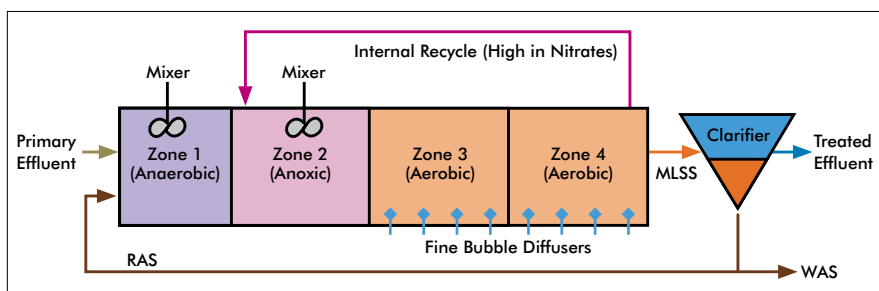


Figure 5

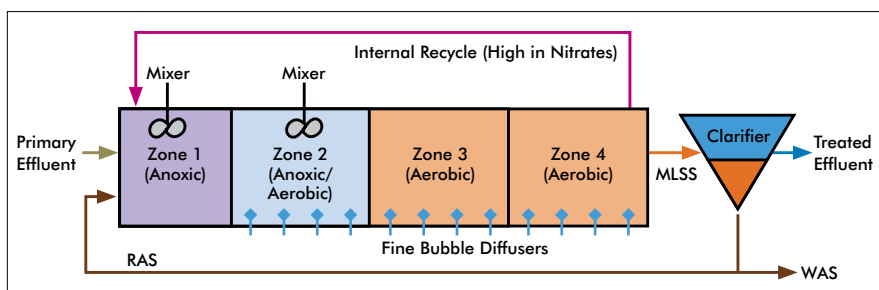


Figure 6

Each year approximately 12,000,000 gallons of 6% Class B biosolids, or 3000 dry tons, are produced and land applied. Figure 4 shows the solids process schematics and approximate percentage solids between processes.

The Water Reclamation Plant has a multifaceted energy management system. There are three heating/cooling loops throughout the plant that are used to recover heat from various processes which can be reused in heating other process such as the anaerobic digesters or plant facilities. Methane gas produced in the anaerobic digesters is either used directly in boilers for building and process heat or is used in two one-megawatt engine generators that are used to produce electricity for use in the plant. Heat is collected off of the engine and also off the engine exhaust to be used throughout the plant. Collection and use of methane gas saves approximately \$600,000 annually in electrical and heating costs.

Energy Efficiency:

The Rochester Water Reclamation Plant has been successfully operating a combined heat and power (CHP) system since 1982. Initially there were two generators rated at 400 kW each, however, they were upgraded to 1000 kW in 2002 and 2008. The generators are Waukesha turbo-charged lean burn engines and have the capability to run off methane (byproduct of anaerobic digestion) or natural gas. Heat is recovered from the engine jacket and exhaust gases in the form of hot water (180°F–190°F) that is used to distribute heat to the anaerobic digesters and



ABC plant



Chlorine contact



Digesters



GBT

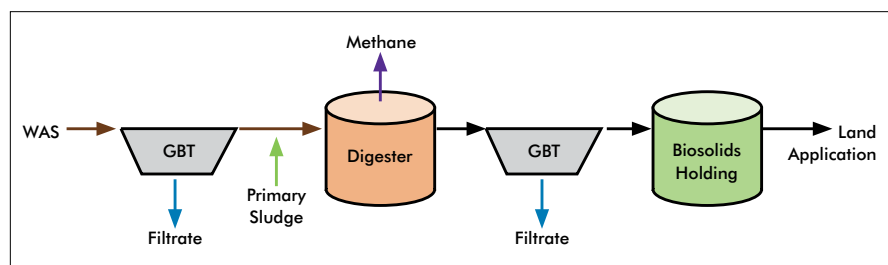


Figure 7



Land Application



- SCADA Systems
- Custom Controls
- System Integration
- Prefabricated Structures
- PLC & HMI Programming

For over 20 years, Starnet has been providing custom solutions to the water & wastewater industry, with a focus on operator safety. Visit us and discover an innovative answer for your application.

Call Us: (262) 886-0228

StarnetTech.com • ArrowStations.com • ArcSafe.com



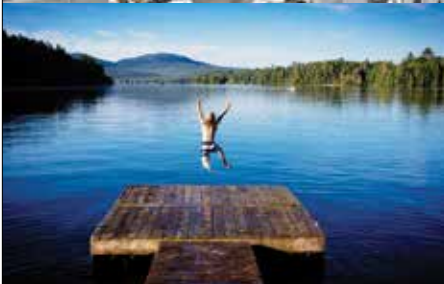


Generator



Heat recovery

Nutrient Recovery for the N-E-W Paradigm



Making Utilities of the Future, Fact.

Ostara nutrient recovery solutions enable Utilities of the Future employing the N-E-W (*Nutrients, Energy, Water*) paradigm to exist. Operational efficiencies are improved. Chemical costs and sludge loads are reduced. Production of high-value and renewable fertilizer enables responsible, sustainable crop nutrition, further protecting the world's waterways. Solutions that work for you. And the planet.



Learn more at ostara.com

seasonal heating of the plant. The engine jacket water system is capable of approximately 2.5 MMBtu/h/engine and the exhaust gas system is designed to recover approximately 2 MMBtu/h/engine.

Two anaerobic digesters produce approximately 375,000 cu ft/day of biogas that contains approximately 66% methane. This allows WRP to typically run the generators between 500-800 kw depending on the season and temperature. The amount of heat recovered is sufficient to provide complete process and facility heating for most of the year (outdoor temperatures as low as 40 degrees). The methane also can also be used in boilers in cold weather and this allows the plant to buy a minimal amount of natural gas, typically only required when temperatures drop below -10°F. The combined heat and power system typically saves around \$300,000 annually in heat and electrical costs.

In 2007, construction was completed on a secondary treatment plant to the Rochester Water Reclamation Plant that increased the overall plant capacity by 4.8 MGD. A new circular primary clarifier was added with a dome for odor control. While ventilation was accounted for, supply air was taken directly from the ambient atmosphere. During the cold weather months the cold air reacted with the warm moist air from the process liquid creating a microclimate within the dome that resulted in fog, condensation, and even precipitation. This atmosphere created an environment that resulted in rapid deterioration of the metal components in the primary clarifier.

To resolve this issue a hydronic heating system that uses thermal energy taken from final clarifier effluent is used to heat supply air into the primary clarifier during the cold winter months. This effectively stopped the microclimate reaction and mitigated the deterioration of the metal components. Simply installing a heater or using the existing hot water loop would have resolved the issue as well but would have driven up capital and operating costs. The system operates with a coefficient of performance of approximately 5.2. This means that for every unit of energy that is input to the system, 5.2 units are output. The difference in energy is heat that is recovered from the effluent water. This results in operating cost savings of approximately 20%-50% vs. using natural gas. [CS](#)

Meet the new members of the HYMAX® GRIP family

HYMAX GRIP ELBOW

Wide-range 45° and 90° restraints

HYMAX GRIP REDUCER

With additional restraining power

HYMAX GRIP SWIVELJOINT

Connects and restrains two pipes AT ANY ANGLE from 0° to 90°

HYMAX GRIP PRODUCT FAMILY

The teeth make the difference

- One-piece construction, with only two bolts to tighten
- Wide-range restraint solutions
- No need to use thrust blocks
- Universal gripping teeth on each end fit metal and plastic pipes
- Allows up to 4° dynamic deflection, reducing future damage
- Angular deflection up to 4° per side during installation

T. 352-509-3600 | 855-4KRAUSZ | E. info@krauszusa.com

HYMAX®

Repair the past. Connect the future.

KRAUSZ is the creator of HYMAX



www.krauszusa.com

OUR TECHNOLOGY IS BASED ON SOUND SCIENCE

Inspect More, Clean Better

Active Acoustics screen for blockage with no flow contact

MILLIONS OF FEET INSPECTED

- Save time, water, AND money
- Screen 2+ miles per day
- EPA validated
- Highly portable and easy to operate



InfoSense, Inc.
Innovating Acoustic Inspection Technology

877-747-3245

sales@infosense.com • www.infosense.com



Wet Well Mounted Pump Stations



NOTHING EVEN COMES CLOSE. FOR TOTAL PUMPING COSTS.

S&L Above-ground EVERLAST™ Pump Stations are never submerged—in sewage or the associated pit of submersible pump O&M costs and requirements. EVERLAST™ stations eliminate confined space burdens, pump stocking and replacement, and inconvenient pump clogs several feet underground. These systems feature superior wire-to-water pump efficiencies, operator-convenient QUICKSMART™ touch-screen controls, and the industry's longest pump life and warranty protection. This translates to real savings in O&M labor time and costs—and it's not even close.

✓ **TRANSLATING TO REAL SAVINGS IN PUMP O&M**

CALL FOR REPRESENTATION THROUGHOUT THE CENTRAL STATES!

{ Phone: 800.898.9122 } { Email: answers@smithandloveless.com }

{ FOR MORE INFO VISIT: SmithandLoveless.com }



Smith & Loveless Inc.



Process. Control. Service.

We are committed to providing *world-class process equipment* and *control system integration* in an efficient and innovative way.
All backed by an *unmatched dedication to service.*

 **energenecs**

WWW.ENERGENECS.COM
800-343-6337

Downers Grove Sanitary District

A Net Energy Producing Facility

By Amanda L. Sheposh, Baxter & Woodman; Nick Menninga, Downers Grove Sanitary District; Derek Wold, Baxter & Woodman



Figure 1.
Downers Grove Sanitary District, aerial view

As the cost of energy rises and facilities aim to reduce operating costs, the prospect of energy independence for wastewater treatment plants is becoming an economically viable goal. However, small-to-medium sized utilities, which represent a majority of sewage treatment facilities in the United States, are often overlooked in the discussion of energy neutrality. The introduction of high efficiency equipment to the wastewater treatment market, coupled with rising electric costs and grant opportunities, has incentivized facilities to pursue energy reduction projects. Over the past 10 years, Baxter & Woodman has collaborated with the Downers Grove Sanitary District (DGSD) to implement improvements supporting energy neutrality at its 11 MGD wastewater treatment center (WWTC).

The DGSD WWTC was originally designed and constructed in 1954. The WWTC has undergone numerous improvements over the years, including major expansions in 1962, 1974, 1986,



and 1988. The treatment process includes bar screens, raw sewage pumping, grit removal, primary clarifiers, activated sludge treatment, intermediate clarifiers, tertiary sand filtration, chlorination, and de-chlorination. For sludge treatment, waste activated sludge (WAS) is thickened

in gravity thickeners. Primary sludge (PS) and WAS are digested separately. Digested WAS is dewatered with a belt filter press. Digested PS is dewatered on gravity sludge drying beds. Dewatered sludge is stored for approximately two years on-site to achieve a Class A



Figure 2. Aeration improvements, including blower and diffuser replacements

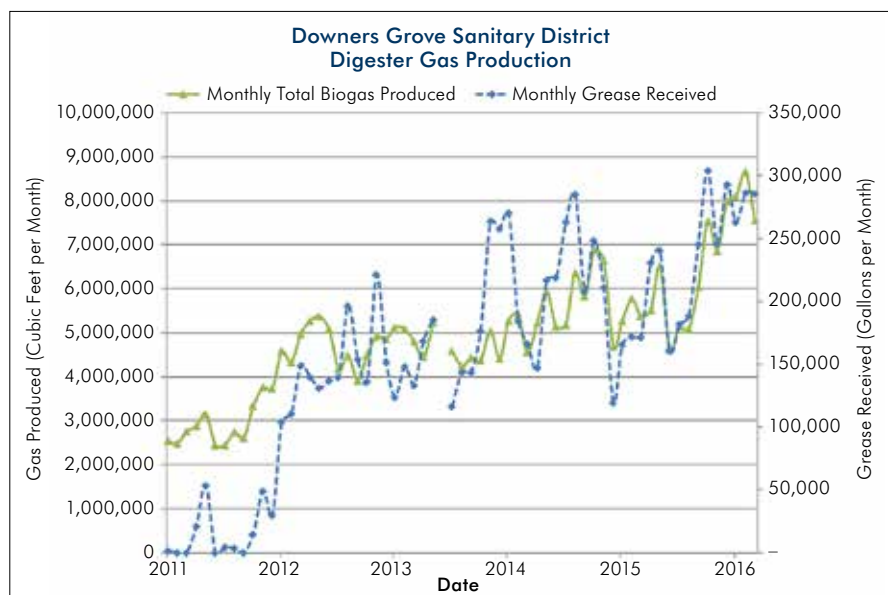


Figure 3. Digester gas production, shown with grease received

biosolids designation. The WWTC treats an average of 11 MGD and is designed for a peak capacity of 22 MGD. Excess flow facilities help the facility treat flows as high as 110 MGD. The district owns and maintains 260 miles of collection system and nine pumping stations. Recent improvements have been constructed to allow treated digester gas to fuel two combined heat and power (CHP) generators, significantly reducing the district's reliance on the grid.

ENERGY REDUCTIONS

The WWTC consumes grid energy in the forms of electricity and natural gas. It also

has the opportunity to use digester gas as an alternative to natural gas. The facility was originally designed to use digester gas primarily for sludge heating purposes, often leaving large amounts of digester gas unused.

As early as 2007, DGSD began several energy-saving initiatives throughout the WWTC and within its collection system. DGSD targeted processes that consumed the most energy in order to make the biggest impact on its energy bottom line.

In 2007, DGSD completed comprehensive improvements to the activated sludge aeration system. The improvements

included the retrofit of single-stage nitrification aeration tanks with fine-bubble diffusers and the addition of a high-efficiency, single-stage centrifugal blower for use alongside the existing multi-stage centrifugal blowers (see Figure 2). The blower was the first high-speed turbo blower to be installed in the state. A mixed liquor connection allowed the conversion of a deeper tank from aerobic digestion to an activated sludge tank. An automatic feedback control system for dissolved oxygen was designed and installed to complement the speed control of the new blower in maintaining the dissolved oxygen concentration in the mixed liquor. The combined effect of the improvements was a reduction in the entire plant power usage by approximately one-fourth.

The project had a total cost of \$1.4 million, annual savings of \$150,000, and received grant funding of \$250,000 from the Illinois Clean Energy Community Foundation.

While not included in the WWTC's energy usage, DGSD made improvements at several pumping stations to reduce energy at those locations. Pumping station improvements included replacing low-efficiency pumps with pumps with more efficient hydraulic characteristics and installing variable frequency drives (VFDs) to replace liquid rheostat systems.

The pumping station improvements had a very positive impact on energy consumption. VFD improvements reduced energy by 40% at the Wroble Lift Station and by 30% at the Hobson Lift Station. DGSD has also controlled peak and baseline energy costs from its long-term inflow/infiltration (I/I) reduction program.

After targeting aeration and pumping, the most common next largest energy using processes in wastewater treatment plants are anaerobic digestion and "lighting and buildings" [1]. Accordingly, the next targets were lighting and building heating, ventilation, and air conditioning (HVAC).

In 2010, DGSD performed an evaluation of the existing lighting systems at the WWTC and Administration Building. Indoor and outdoor areas of the plant site, process facilities, and administrative facilities were evaluated. Lighting types, both indoor and exterior, were recorded and the data was used to evaluate the current energy consumption, determine potential LED retrofit applications, identify grant opportunities, and evaluate the

energy savings and payback period for the proposed retrofit. The study reaffirmed the district's already ongoing efforts to replace T12 lamps with T8 lamps indoors, replace incandescent lights with compact fluorescents and LEDs for exterior lighting, replacing fixtures through a maintenance replacement program. Motion detectors and run-down timers have been placed on numerous fixtures throughout the WWTP to reduce the instances of lights left on when areas are unattended.

DGSD conducted the lighting replacement effort in-house. Based on the recommendations of the Lighting System Improvements study and subsequent lighting fixture replacements, the district has achieved over \$8,000 energy savings per year for a three-year payback. The district received grant funding for these improvements under the Illinois DCEO lighting program.

DGSD has also made several improvements to its WWTC buildings to reduce the energy demand for HVAC. For example, a digester-gas fired desiccant dehumidifier in the sand filter building replaced traditional air conditioning units. DGSD started an effluent water heat pump replacement program to replace traditional building heating and air conditioning with geothermal heat pumps piped with effluent water. DGSD has also installed an absorption chiller, which uses digester gas to provide cooling to the Operations Center.

By 2012, the WWTC electrical average demand had dropped from approximately 780 kW to 540 kW. After reducing baseline energy use through these energy efficient projects, DGSD and Baxter & Woodman turned their attention toward

options for generating renewable energy to offset total energy consumption at the WWTC.

GREASE RECEIVING

Prior to receiving hauled grease, the WWTC produced an average of 86,000 cubic feet per day (cfd) of digester gas. Using available technology, the digester gas could be used to produce approximately 210 kW in electrical energy. DGSD began to evaluate co-digestion as a way to offset more of its energy needs.

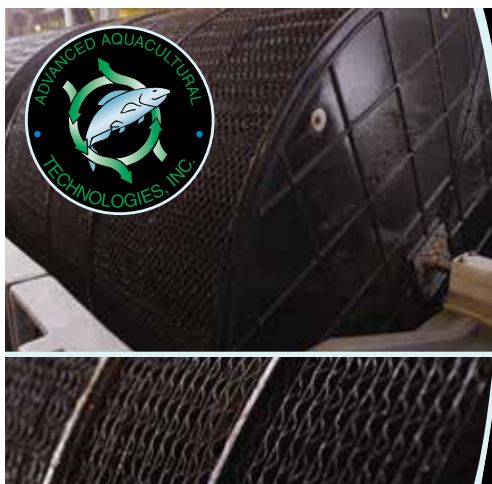
In 2011, DGSD began accepting hauled restaurant grease trap waste for co-digestion to boost digester gas production. DGSD has the advantage of oversized anaerobic digesters. Three of the five anaerobic digesters operate as primary digesters. At domestic loadings only, the primary digesters were designed at roughly 36 pounds of volatile solids per day per thousand cubic foot (ppd/kcf). State standards recommend loadings not exceed 80 ppd/kcf, leaving significant digester volume available for receiving high-strength waste.

The hauled restaurant grease trap waste program was established through a change in DGSD's ordinance. Haulers are required to maintain a permit and are charged a fee for each delivery. The district monitors waste volumes and characteristics and collects samples of every delivery. In 2012, the district received an average of 4,000 gallons per day. In 2017, the daily average grease received is up to 10,500 gallons. The received grease has an average total solids content of 7.3%, with 91% volatile solids. Figure 3 shows the digester gas production with respect to grease received.

In 2012, the digester gas production was up to 148,000 cfd. The gas production so far in 2017 is an average of 214,000 cfd. Methane analyzers on the digester gas production pipe are monitored as part of the CHP operation, with typical values around 70%. The methane content can be directly related to the digester feed source (whether PS or WAS with hauled grease). The evaluation has pointed to higher methane content for the WAS/grease food source as compared to primary sludge. Therefore, not only does the grease boost digester gas production, but it also produces digester gas with a higher fuel content.

DGSD evaluated several options for digester gas-to-energy, including Combined Heat and Power (CHP), microturbines and fuel cells. CHP was selected as the most energy-neutral, reliable, and cost-effective technology. CHP uses treated digester gas to fuel an engine. The engine is coupled to an electrical generator, and electrical efficiency is typically 30-40%. In a typical engine-generator situation, the lost efficiency is dissipated as heat, noise, and vibration. In a CHP system, thermal energy is captured through heat exchangers and sent to heating loops that can be used to provide heat to building and process heating. While there is still loss to heat, noise, and vibration, CHP systems can collect as much as 40-45% of the thermal energy to result in an overall energy efficiency above 80%.

In 2013, DGSD benchmarked its energy performance. The benchmark also took into account the total energy potential of the digester gas produced.



A BETTER FILTER, A BETTER FUTURE.

The Modular Rotating Biological Contactor
By Advanced Aquacultural Technologies

More efficient, more effective:

- Configurable to most sizes of systems, flexible and modular in nature
- Biological filtration while providing oxygenation and CO2 stripping
- Save energy over trickling filters

Capable of supplementing existing filtration systems or serving as a primary system for a small community or development.

Learn more at:

www.advancedaquaculturaltechnologies.com 1.574.457.5802.

Table 1. Baseline energy usage, Downers Grove Sanitary District, March 2011 – July 2013.

Energy Type	2012 Usage	Units
ELECTRICAL		
Total Annual Usage	4,883,300	kWh
Daily Usage	13,379	kWh/d
Average Demand	557	kW _e
NATURAL GAS		
Total Annual Usage	16,500	Therms
Total Annual Usage	1,650	MMBTU _h
Daily Usage	4,520,500	BTU _h /d
Equivalent kW	55	kW _t
DIGESTER GAS USED		
Digester Heating and Building HVAC	170,000	Therms/yr
Daily Usage	46,575,000	BTU _h /d
Equivalent kW	569	kW
Total Energy	1,181	kW



Figure 4. Digester gas treatment system

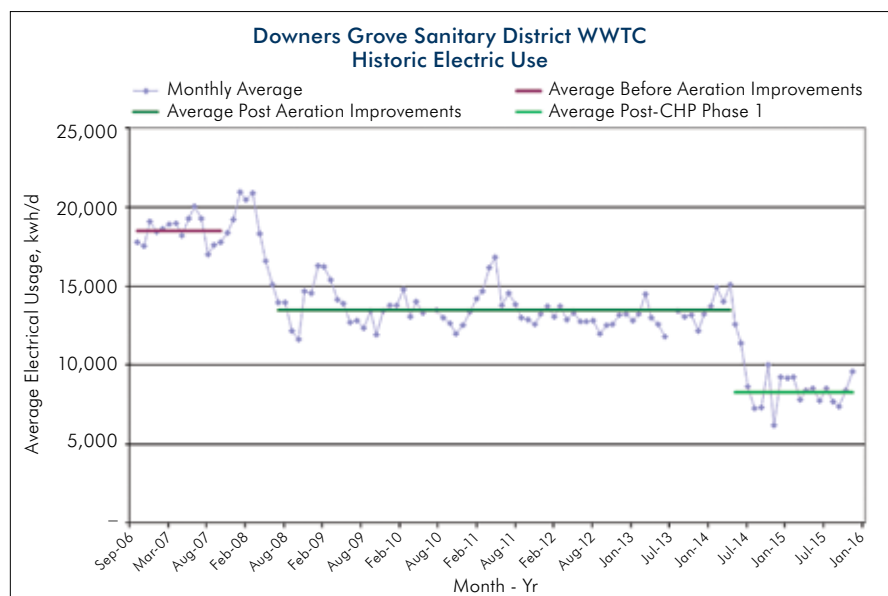


Figure 5. DGSD historic electric use showing improvements over time

As outlined in Table 1, the WWTCT overall used 557 kW of electrical energy and 624 kW equivalent of natural gas and digester gas. According to the relative efficiencies, a CHP system designed to meet the average electrical demand would produce a surplus of thermal energy. However, the energy potential of the digester gas would need to be roughly three times the electrical demand. With the success of the grease receiving program, which showed the potential to meet that requirement while increasing revenues, the district moved forward with design of the first of two phases of digester gas-to-energy projects.

Phase 1 of the CHP Improvements project included reuse of a previously abandoned engine generator building. The 280 KW engine-driven generator was estimated to offset approximately half of the electricity used at the WWTCT, while providing a major portion of the digester heat load. The project also included construction of gas treatment facilities to remove hydrogen sulfide, siloxanes, moisture, and particulates from the digester gas. The gas treatment equipment was sized for the ultimate (i.e., Phase 2) gas use. See Figure 4. The project was successful in demonstrating the proof of technology and much of the project financials. However, the engine continues to have issues with derating, which result in lower energy production than planned. Figure 5 shows the energy impact of the aeration and CHP improvements projects by charting energy use from 2006 through 2015.

In order to compensate for the shortcomings of CHP No. 1, the second phase of the project utilized a larger engine. Phase 2 of the energy generation improvements included installation of a 375 kW CHP system that was brought online in May 2017. The second CHP unit, pictured in Figure 6, was installed in the old chlorine cylinder room, which required major changes to the building's structural and HVAC systems. CHP No. 2 operates at or near its nameplate electric output and efficiency.

Together, CHPs No. 1 and No. 2 have a total nameplate capacity of 655 kW electrical and 2.5 MMBTU/hr of thermal output. The heat recovered from the system is used to provide the total heat demand to the digesters. Modifications are being considered to convert

summertime waste heat via heat pumps to fuel another absorption chiller. This energy runs all plant equipment during dry weather flow and produces a surplus of thermal energy throughout most of the year. After significant coordination with ComEd to execute interconnection and net metering agreements, DGSD is able to send the excess renewable-sourced electricity back to the grid. June 3, 2017 marked the first day the District generated more electrical energy than it used, with a goal of “net positive” energy over the next year.

CONTINUAL IMPROVEMENTS

DGSD continues to look for opportunities to reduce energy consumption, boost energy production, and further improve its bottom line. In Spring 2017, the district installed a new grit blower to provide air to the aerated grit removal system. The 15-hp rotary lobe blower replaced an inefficient 30-hp multistage centrifugal blower, reducing the process energy use by half. DGSD continues to look for opportunities to reclaim excess thermal energy, as well.

ACHIEVEMENTS

DGSD’s experiences show that energy can be a controllable expense. Digester gas can be a cost-competitive, renewable fuel. DGSD received energy incentives or grants for nearly all of its energy-reducing projects. The digester gas-to-energy projects will have received 33% funding through grants when the validation period is complete (May 2018). The grease receiving program continues to generate substantial revenues and opens opportunities for supplementing carbon for phosphorus removal in the future.

While energy neutrality is typically considered an opportunity for very large utilities, DGSD was able to make stepwise improvements that demonstrate that energy neutrality is more than a possibility for small-to-medium sized facilities – it is a financially sound investment.

The WWTC now recovers valuable energy resources and can produce as much energy as it uses. In recognition, DGSD has received a Utility of the Future Today Award from the National Association of Clean Water Agencies, the Water Environment Federation, the



Figure 6. CHP No. 2

Water Environment Research Foundation and the United States Environmental Protection Agency.

REFERENCES

- [1] Water Environment Energy Conservation Task Force: Energy Conservation in Wastewater Treatment. (EPA 832-R-10-005). September 2010. [CS](#)

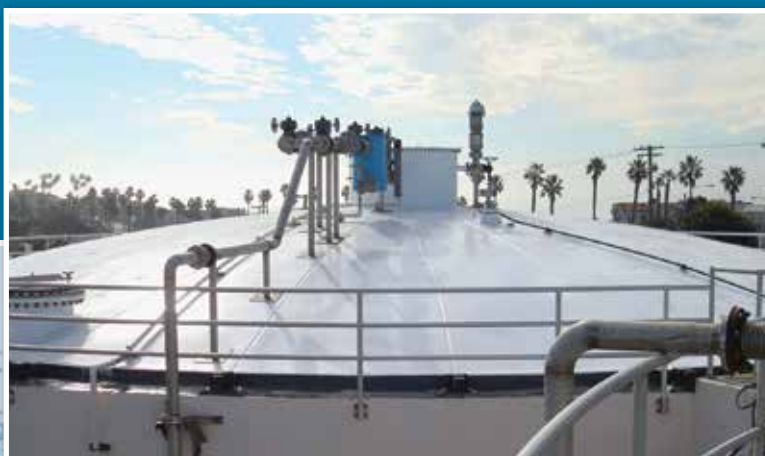
Anaerobic Digestion Equipment

Steel and Stainless Steel Digester Covers, Mixers, Heating Equipment, View Ports, Foam Separators, and other accessories. Equipment is designed to applicable AISC, AWS, ASME, ASCE codes and fabricated by OTI employees to ensure the highest quality.

www.oti.cc
Ph 541-689-5851

 **OTI**
Olympus Technologies, Inc.

Represented By:
IL – C.E. Soling & Associates (847.406.8493)
MN – Van Bergen & Markson, Inc (763.546.4340)
WI – Mulcahy Shaw Water (262.241.1199)



**THREE REASONS WHY YOU SHOULD CHOOSE
MINNESOTA, WISCONSIN & ILLINOIS' MOST TRUSTED
WASTEWATER TANK, EQUIPMENT AND SERVICE TEAM
FOR YOUR NEXT PROJECT**

1. We offer **MARKET-LEADING COATINGS AND EQUIPMENT**
2. On average, **WE BUILD A TANK EVERY 4-5 DAYS.**
3. Our industry reputation. We are the world's largest bolted tank distributor.

We are, and always will be, **INDEPENDENTLY-OWNED.**

With over **37 YEARS OF EXPERIENCE** building tanks in the United States, we will be your **CONSULTATIVE PARTNER** helping you choose the right tank and equipment for your application.

TANKS, DOMES, COVERS, EQUIPMENT & LIFECYCLE SERVICES



**Engineering
America**

TANKS DOMES COVERS

TONY BELDEN
WHITE BEAR LAKE, MN
WWW.ENGAMERICA.COM
651.777.4041

Represented by



MATT FRITZE
OAKDALE, MN
WWW.GNENV.COM
651.289.9100



WASTEWATER TREATMENT AND CONVEYANCE SYSTEM DESIGN

GLOBAL WATER STEWARDSHIP – DOMINICAL, COSTA RICA

By Megan Wolfe, Andrew Szymaszek, Linjie Tang, and Catherine Terando

ON APRIL 10, four students from the University of Wisconsin-Platteville competed in the CSWEA Student Design Competition at the Monona Terrace Convention Center in Madison, WI. The objective of the competition was to design and present a wastewater treatment and conveyance system for Dominical, Costa Rica. The team consisted of Megan Wolfe, Andrew Szymaszek, Linjie Tang and Catherine Terando, all senior level environmental engineering students. Michael Penn and Philip Parker served as the University of Wisconsin-Platteville engineer advisors for the project, and Mohammed Haque and Zachary Wallin served as the CSWEA engineer advisors for the project.

CONCERN

Dominical, Costa Rica is a small, rural, beach community located on the Pacific Ocean. The community currently deals with poor sanitation including overland greywater flow, failing septic tanks, and little to no modern wastewater conveyance system. Due to the poor wastewater conditions found in Dominical, Central States Water Environment Association – Global Water Stewardship determined that this area is in need of a centralized wastewater treatment system.

FIGURE 1: Site locations



The wastewater treatment facility (WWTF) design needed to be simple to operate and maintain, cost effective (both initially and annually), and ultimately meet a 50 mg/L biological oxygen demand (BOD) concentration and 50 mg/L total suspended solids (TSS) concentration in the effluent water. Electricity in the region is also noted to be intermittent. In addition, it would be necessary that the proposed WWTF meet footprint requirements based on potential site selection(s). There are three general location options with five total site options

(Figure 1). Site 3A, 3B, and 3C are located in Dominicalito, a smaller village about 1.4 miles southwest of Dominical.

Additionally, Dominical is on the verge of major population growth. Currently, there are approximately 450 inhabitants, but a significant increase in development will expand the local tourist industry over the next 15 years. This will bring the population total to approximately 4,500 (including residents and tourists) in 2032.

In order to evaluate wastewater treatment and collection system alternatives, an estimated population

projection was first created, and flows determined from those projections. Flows were separated into dry weather and wet weather. The dry season or tourist season for Costa Rica is typically from December-April and the wet season is May-November. The Dominical, Dominicalito, and tourist populations were separated so that varying water usages could be applied. Tourists tend to use more water than the local populations, especially in developing countries, and therefore a tourist water usage of 400 L/day/tourist was used. Flows are tabulated in Table 1.

TABLE 1: Wet and dry season flows

Season	2017 Average Flow (m ³ /day)	2047 Average Flow (m ³ /day)	2017 Peak Flow (m ³ /day)	2047 Peak Flow (m ³ /day)
Wet	260	1360	1000	4380
Dry	340	1670	1270	5270

FIGURE 2: Anaerobic pond cross-section

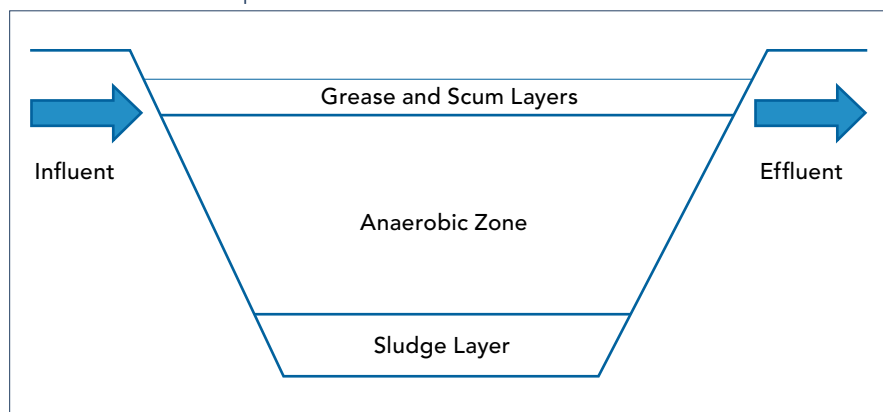
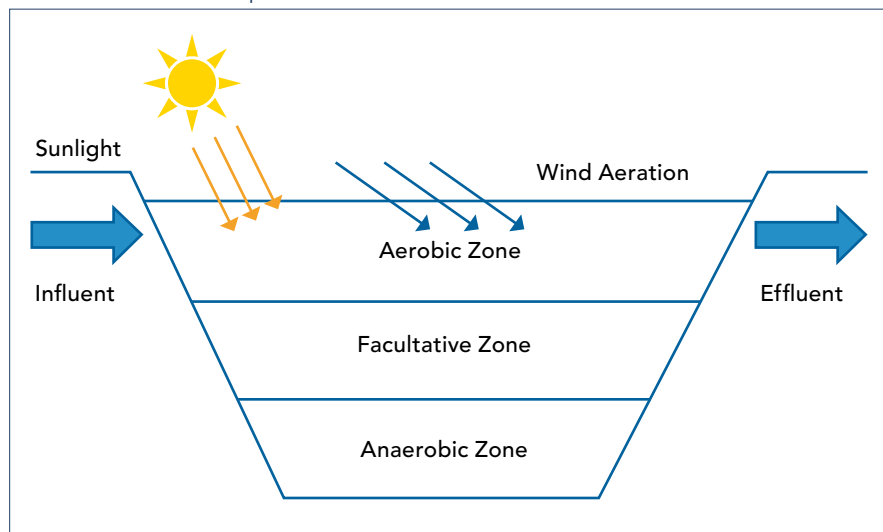


FIGURE 3: Facultative pond cross-section



EVALUATION OF ALTERNATIVES

Once flow projections were made, a methodology for the evaluation of a WWTF for Dominical was created. Since various criteria needed to be considered, a scoring matrix was utilized to evaluate the various alternatives for this project. Overall, two matrices were used including a site scoring matrix and a unit process scoring matrix.

SITE SELECTION

When evaluating site size for the site scoring matrix, the Maritime Zone was considered. The Maritime Zone is a 200-meter wide strip of land running parallel to high tide. It is broken down into two sections, a public zone (50 meters from high tide) and a restricted zone (150 meters from the public zone). In the public zone, absolutely nothing may be built, and in the restricted zone, only projects receiving permission from the local municipality may be built (Alcance 1977). Site 3 is partially located in both the public and restricted zones, and Site 2 is partially located in the restricted zone.

A site selection scoring matrix was created based on importance of selected criteria. These criteria were categorized and weighted for each matrix. Categories for the site scoring matrix included site size, vertical distance to town center, horizontal distance to town center, site topography, and real estate cost (listed greatest weight to least).

PROCESS SELECTION

A treatment process scoring matrix was separated into primary and secondary processes. Categories for each process included operations and maintenance

(O&M), capital cost, complexity, and expandability (listed greatest weight to least).

DESIGN SOLUTION

Upon completion of the scoring matrices, Site 2 was the most feasible option and an anaerobic pond was the highest rated primary treatment process as well as the secondary treatment process. Although an anaerobic pond was deemed the best secondary treatment process, a facultative pond was chosen instead (the second highest rated secondary treatment process). Using a facultative pond allows odor issues to be minimized, gravity flow between ponds, and minimum excavation. Additionally, a facultative pond is commonly paired with a rock filter to remove residual algae from the facultative pond effluent.

TREATMENT SYSTEM

As previously stated, the anaerobic pond is the primary treatment process for the WWTF. An anaerobic pond contains three layers. The top is the grease and scum layer, followed by the anaerobic zone, with the sludge layer at the bottom. A sketch of the cross section of a typical anaerobic pond is shown in Figure 2. The BOD decomposition that occurs in the pond by bacteria is carried out in two phases. The first phase is putrefaction, where bacteria decomposes organic matter into organic acid and forms new bacterial cells. Then, the second phase is methanogenesis, where bacteria break down the products from the first phase into methane, carbon dioxide, water, ammonia, hydrogen sulfide, and forms new bacterial cells (Chagnon 1999).

The anaerobic pond is able to treat high BOD concentrated wastewater while removing a significant portion of the BOD. In order to accommodate for the variation in flow over the design life, three anaerobic ponds in parallel were designed. The construction plan of the three ponds is dependent on available capital. However, it is recommended to be carried out in phases. In order to allow for redundancy, piping is routed so that when any of the three ponds are down for maintenance, the other two ponds can receive the flow. Since anaerobic ponds serve as a primary treatment, no firm capacity is

required. In order to maintain a 3:1 side slope, a minimum depth of 3 meters, and maintain a truncated pyramid shape, the volume of each anaerobic pond was designed to be 767 m³.

Similar to the anaerobic pond, the facultative pond has three layers. The aerobic zone is the top layer, the facultative zone is the middle layer, and the anaerobic zone is located on the bottom. A cross section view of a typical facultative pond can be found in Figure 3. Due to both natural aeration created by wind and the oxygen that is produced

through photosynthesis by algae, degradation of organic matter in the facultative pond occurs differently in the various layers. Algae are essential factors in aerobic and facultative zone which is doing most of the treatment in the pond. Thus, facultative ponds are typically shallow in order to maximize algae growth. Oxygen that is produced by the algae can be used by the aerobic and facultative bacteria.

The effluent from the anaerobic ponds is piped directly to the facultative ponds. A high BOD loading into a facultative pond



Let's show the world what we can do together.

Day by day. Project by project.

Together we're engineering clean water and preserving the world's most valuable resource.

SEH

Engineers | Architects | Planners | Scientists

Building a Better World for All of Us®

sehinc.com • 800.325.2055

has the potential to overload the pond, turning it into a shallow anaerobic pond. Thus, the BOD loading reduction from the primary treatment prevents overloading in the facultative ponds. The facultative ponds are designed based on surface loading rates. The pond is designed with a shallow depth to account for the aeration requirement which ensures the pond remains facultative. The residual algae in the effluent from the facultative pond will increase both particulate BOD and TSS concentrations. Therefore, filtration or sedimentation is typically used in conjunction with facultative ponds. In order to better utilize land area and to minimize construction and O&M costs, a rock filter is recommended as the final

treatment process. The rock filter will polish the effluent from the facultative ponds by filtering out the residual algae and removing a significant portion of the TSS (and thus particulate BOD).

The facultative ponds are also divided into a three-pond design that work in conjunction with anaerobic ponds. It is important to distinguish that each anaerobic pond does not run solely into a corresponding facultative pond, but can be piped from any anaerobic pond to any facultative pond; therefore treatment capacity can be ensured during maintenance. Facultative ponds generally accumulate less sludge in comparison to anaerobic ponds, which results in minimal to no dredging needed during its

design life (Mara 2004). The facultative pond depth is 2.1 meters with an additional 0.5 meters of freeboard above the fluid depth. This is determined by the recommended range and construction feasibility so that gravity flow can be used throughout the site.

In order to maintain a 3:1 side slope, a minimum depth of 2.1 meters, and maintain a truncated pyramid shape, the volume of each facultative pond was designed to be 2710 m³ which brings the final surface area to 1944 m². The facultative pond effluent includes residual algae, which will be removed with the rock filter (Mara 2004).

To remove the residual algae found in the effluent from the facultative ponds a rock filter would be utilized (Figure 4). Approximately 70–90% of BOD in the facultative pond effluent is from residual algae (Mara 2004). In studies conducted by the Environmental Protection Agency (EPA), the standard for wastewater effluent, 30 mg/L BOD and 30 mg/L TSS, can commonly be met with a rock filter as the final treatment process (USEPA 2002). A 70% removal rate of BOD from the rock filter was conservatively chosen which is done to account for the variance of flow estimates as well as the uncertainty of the wastewater characteristics. The resulting BOD concentration of the filtered effluent is estimated to be 23 mg/L. In order to better estimate the TSS removal efficiency of the system, the information of average

FIGURE 4: Rock filter cross-section

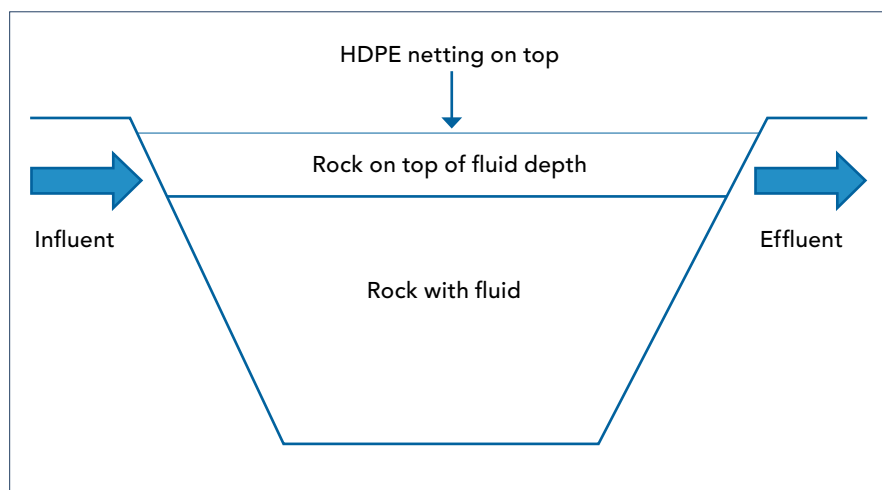
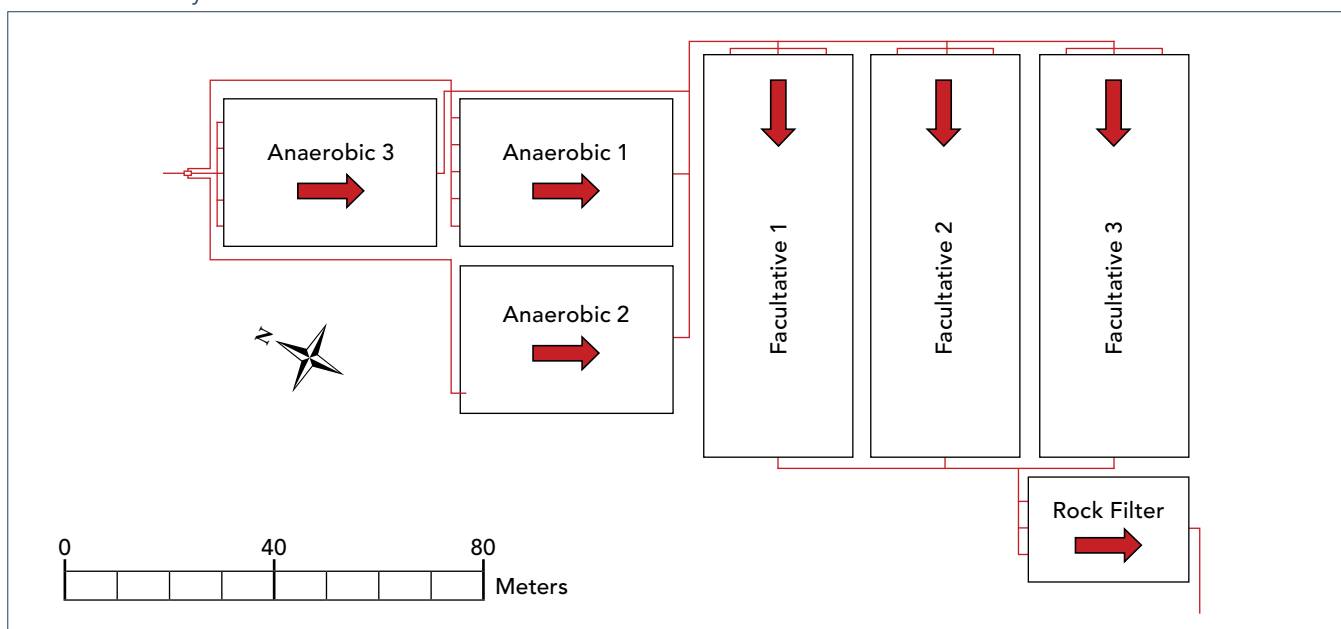


FIGURE 5: Site layout in 2047



diameter and density of the TSS in influent wastewater are needed. However, based on case studies conducted by the EPA and Mara, typical TSS of the final effluent is within 10% differences of 30 mg/L, regardless of temperature.

The submerged horizontal flow rock filter design is based on EPA recommendations including: the hydraulic loading rate (1,000 L/m³/day), a typical depth of 1.8 meters of treatment rock, an additional dry-rock layer of 0.3 meters, and a 3:1 slope to prevent erosion (USEPA 2002). Applying similar consideration for side slope, minimum depth, and shape of pond requirement, the volume of the rock filter was calculated to be 567 m³.

Due to the shallow groundwater table throughout the site, lining is required in all three processes of the WWTF. Due to the potential contact with the groundwater table, two layers of lining are recommended to ensure the safety of the groundwater. The first layer would be a HDPE layer that is directly in contact with the wastewater. Locally supplied HDPE material is suggested which provides convenient maintenance. The second layer would be a clay layer with a minimum thickness of 300 mm which creates a barrier between the HDPE and the groundwater.

Rock filters can have potential issues such as providing a desirable breeding ground for flies and mosquitos, as well as a sufficient surface for algae growth. The algae and larva can be difficult to remove, cause potential odor issues, as well as create a health and safety concern. Therefore, black high-density polyethylene (HDPE) netting is suggested to provide shading and minimize insect problems.

SITE LAYOUT

As previously stated, Site 2 was chosen as the location for the design of a WWTF in Dominical. A schematic of the WWTF in the design year of 2047 is depicted in Figure 5.

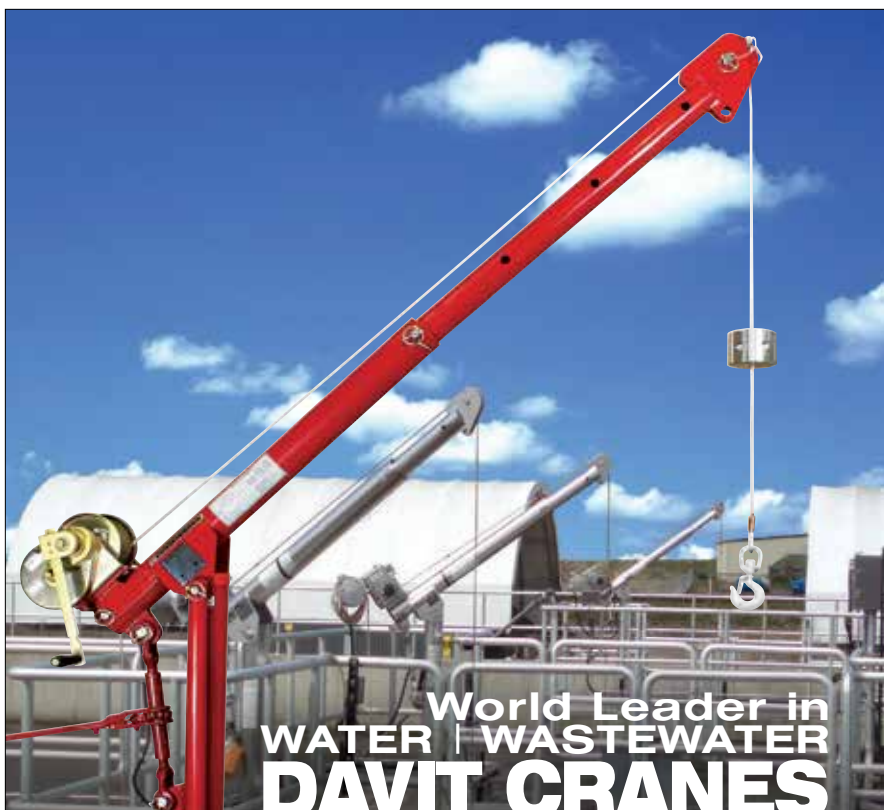
Each anaerobic pond has five inlets and each facultative pond has three inlets to reduce short circuiting (Goad 2015). The construction of the WWTF is recommended to be separated into two phases. In Phase I anaerobic and facultative ponds 1 and 2 will be constructed, as well as the rock filter.

Once a flow of 600 m³/day is reached, building Phase II should be considered.

Phase II should be completed and operational by the time at which the flow reaches 1200 m³/day. Phase II is the addition of anaerobic and facultative ponds 3. Effluent flow from the WWTF will be discharged into the creek that runs through Site 2. Since there will be an increase in flow due to effluent discharge it is recommended to armor the creek. The creek also intersects with the base of the berm of Anaerobic Pond 2, so it is recommended to redirect the creek. The entire WWTF utilizes gravity flow through 8-inch HDPE.

COLLECTION SYSTEM


The sanitary sewer system was designed with consideration to the Great Lakes – Upper Mississippi River Board (GLUMRB). These standards require minimum conduit slopes of 0.40 m/100 m for 8-inch piping to ensure a self-cleansing velocity of 0.6 m/s while the pipe is flowing full. To reduce excavation and dewatering, a slope of 0.38 m/100 m was utilized for the gravity flow piping as shown in Figure 6. These portions of the collection system were located on areas of land that are relatively flat. For the remaining pipes




**World Leader in
WATER | WASTEWATER
DAVIT CRANES**

Thern offers a broad range of standard davits for lifting pumps, gates, UV panels, mixers, man-hole covers, trash baskets and more . . . Virtually lifting anything weighing up to 3000 lbs. Unique situation? No problem - Thern can custom manufacture a crane to fit any situation or application.

Talk to our experienced staff and find out how these portable, rugged and affordable cranes can give your facility a lift. 1.800.843.7648



Made In USA



TERN
WINCHES AND CRANES

Manufactured in Winona, MN USA | www.thern.com

an appropriate slope was designed to maintain a minimum cover of 0.9 meters to ensure that the pipe material is not damaged from surface loads.

GLUMRB also requires that manholes be placed at all intersections and at distances no greater than 120 m; this resulted in 19 manholes for the conveyance system. The design focus for the pipe network was to minimize excavation and O&M costs.

The collection system follows parallel to roadways to avoid excavation in backyards and corresponding easements that would be required. Following the roadways would allow all buildings in Dominical to conveniently connect to the sewer collection system.

Since the collection system does not directly connect to Dominicalito, the current septic tank systems will still be utilized in Dominicalito and pumped as needed, then trucked to the WWTF. The 200 m³/day load from Dominicalito would be directly deposited into the wet well directly preceding the WWTF.

The gravity flow pipe size for the system was designed to be 8 inches in diameter to comply with the minimum diameter requirement of GLUMRB. The 8-inch pipe was sufficient to convey the design life flows. HDPE piping was

chosen to accommodate ground shifting during earthquakes, prevent excessive infiltration, and to provide an increased design life of the system. The piping has an expected life of 50-100 years (Plastics Pipe Institute n.d.).

The primary areas of development in Dominical will occur directly west of Site 2 and north of highway 34. Therefore, the pipe system north of highway 34 was designed to accommodate the flow from the development expansion.

Though gravity flow is primarily used in the design of the collection system, two wet wells, two pumps and two pressurized pipes are needed to accommodate pumping to the inlet of the WWTF, which is the same as the outfall of the collection system. Each wet well has a pump that was designed based on the required head and flow needed.

Both pumps were modeled for start of life and end of life scenarios to ensure the system could run and the pumps would meet NR110 requirements. In wet wells, NR110 requires that the minimum pump cycle is greater than or equal to 5 minutes and does not exceed 30 minutes (Wisconsin Legislature 2014). It was determined that Pump 1 would have an average pump cycle of about 7.8 minutes at start of life and 7.7 minutes

at end of life while Pump 0 would have a pump cycle of about 21.5 minutes at start of life and 5.5 minutes for end of life. It is recommended to have generators at both lift stations to ensure wastewater can still be pumped to the WWTF during long power outages.

COST ANALYSIS

Costs were estimated for the entire system. Unit costs were given for various materials and services. These given costs were multiplied by the total quantities for each of the given material or service. The conveyance system took into account the cost of pumps, pipe, excavation, dewatering, and house hook-ups. The treatment system accounted for excavation, labor, pipes, pond liners, and rock cost. O&M costs (testing, electricity, labor, odor control, etc.) were also estimated on a yearly basis. The total estimated capital cost of the treatment facility and collection system is around \$1.9 million with yearly O&M costs around \$12,000.

REFERENCES

- Alcance. 1977. "Law of the maritime and terrestrial zone." Law No. 6043. La Gaceta, March 2.
- Chagnon. 1999. *Design and Dynamic Modeling of Waste Stabilization Ponds*. M.Eng.
- US EPA. 2002. Wastewater Technology Fact Sheet- Rock Media Polishing Filter for Lagoons. United States EPA.
- Goad, Mark. 2015. "Introduction to Waste Stabilization Ponds." Waterworld. Accessed March 2017. <http://www.waterworld.com/articles/print/volume-27/issue-10/editorial-features/introduction-to-wastewater-treatment-ponds.html>.
- Great Lakes - Upper Mississippi River Board. 2014. *Recommended Standards for Wastewater Facilities*. Policies, Albany: Health Research, Inc.
- Mara, Duncan. 2004. *Domestic wastewater treatment in developing countries*. London: Earthscan.
- Plastics Pipe Institute. n.d. "HDPE: High-Density Polyethylene Pipe Systems." *Plastics Pipe Institute*. Accessed 3 2017.
- Wisconsin Legislature. 2014. *Wisconsin Legislature: NR 110.13*. March. Accessed March 16, 2017. <https://docs.legis.wisconsin.gov/document/administrativecode/NR%20110.13>. CS

FIGURE 6: Dominical wastewater collection system





**EFFICIENCY
SAVES MONEY.**

**CONVENIENCE
SAVES TIME.**

WE OFFER BOTH.

It's the synergy that comes from supplying both pump equipment and electrical controls to operate those pumps. It's the one stop shop for selection and sizing as well as after-market service to the end user.

We sell solutions that provide the highest operational efficiency. We have premium-efficient pumps and motors along with advanced control strategies to reduce energy costs.

We understand your needs and the dynamics of your situation. We'll develop customized solutions and enhanced services that you can't find anywhere else. With one call, find out why L.W. Allen pumps and Altronex control systems have become the leading provider of pumps, controls, technical assistance and superior customer service.



L.W. ALLEN
PUMP SYSTEMS



ALTRONEX
CONTROL SYSTEMS

**Reduce your energy costs
and save time. Call (800) 362-7266.**

4633 Tompkins Drive • Madison, WI 53716
(608) 222-8622 • FAX (608) 222-9414 • www.lwallen.com



An Approach to Water and Wastewater Treatment with Solar-power: Removal of Cyanobacterial Contaminants via Electrocoagulation-Sand Filtration

Laurel Chen and Reilly Olinger, Brookfield Central High School



Figure 1.1

Abstract

The availability of drinkable water diminishes with the increase of cyanobacterial blooms. This study set to determine the: (1) feasibility of solar-powered electrocoagulation (EC) on *Anabaena*, (2) effects of pH on the EC, and (3) effectiveness of sand-filtration as a polishing step. EC works by charging particulate matter in solution causing it to clump, as hydrogen ions float this “floc” to the top. Research has been done on EC, but few studies have been done using slow-sand filtration, solar energy, and cyanobacteria. It was hypothesized that treatment would be most effective at a pH of 2 and slow-sand filtration would be less effective than EC, but an ideal post-treatment step. It was determined that solar EC was not feasible in Wisconsin winter, but it could be effective at sunnier times. Of the pHs tested (2, 4 [control], 6, and 8), the control produced the greatest decrease in turbidity and green absorbance levels according to the scanning spectrophotometer. Although the sand filter did not affect turbidity much, it did produce a qualitative drop in absorbance, making it perfect for post-treatment clarifications.

Introduction

About 783 million people worldwide do not have access to clean water for not only drinking purposes, but also everyday usage, according to UN Water [1]. Surely, this significant figure highlights a social responsibility to the better-off. It also inherently emphasizes to the world that eco-friendly, effective, and/or cheap methods for turning wastewater and other contaminated water sources alike into

potable/semi-potable water has been extremely difficult for many communities to salvage, especially as centralized systems in developing countries. Regrettably, this struggle of an endeavor to save this precious commodity of water can still be seen today, even in the most urban of areas – during the continuous research and studies for this experiment, trips to some thriving cities in coastal countries like Mexico and Puerto Rico, where water definitely plays a capitalizing and important role, were made to further explore and observe the harsh and critical conditions of poverty and environmental impacts of a lack of sanitary water sources (see Figure 2.1, 2.2, 2.3 and 2.4 below). For example, some of the challenges in developing countries like Mexico alone include drinking water scarcity and inadequate water service quality.

In fact, according to some studies done by the 2000 census, 55% of Mexicans receive water only intermittently (“Water” 2017). Poor technical and commercial use, such as from paper mills, and after-use of most utilities contribute to polluted waterways and ever-growing, unsustainable or untreatable wastewater bodies (only 36% of wastewater received treatment in 2006 alone).

Novel methods

There are some fairly new methods that have generated a lot of attention due to their potential cost-benefit possibilities, despite the lack of controlled testing for optimization and/or efficacy. One of the most promising wastewater and water treatment techniques in this day and age is that of electrochemical coagulation, or in short, “electrocoagulation” (EC), where an



L-R: Figure 2.1, 2.2, 2.3 and 2.4 show various areas around the cities of Cancún, Mexico, and San Juan, Puerto Rico, stressing the poorest of areas, even in seemingly “urban” civilizations. An emphasis on the importance of water (as coastal countries) in these extremely hot and dry areas is extended as well.

anode and cathode (with a direct current flowing through) are used to stimulate removal of eventually hydrogenated suspended solids that coagulate into flocs. The flocs (usually contaminants that would not have been able to be seen with the naked eye or are too hard to remove without some kind of energized heat source) are then subsequently removed (see Figure 2.5).

Although relatively new, the method indeed has a promising future as it has just started to be used in some contemporary research, like in a study done by Pirkarami in 2013 [2]. The method is more reliable and produces less waste than chemical coagulation. However, the process does have one downfall – some of the pollutant not electrocoagulated out, often referred to as “sludge,” sinks to the bottom of the effluent, and this calls for the means of additional polishing. This is why secondary or post-treatment is often needed, and this is also where processes like filtration and flotation tend to get ridiculously expensive.

Fortunately, both rapid-sand filtration and slow-sand filtration have recently been on the rise as a very cheap way to remove microbial contaminants from water sources. Slow-sand filtration, for example, with a high flow rate of up to 0.6 liters per minute, is simple to use, especially on a local, decentralized scale (implemented on the household level) and its acceptability is key to its success. There is often visual improvement of the water, as turbidity decreases, and there is “proven reduction of protozoa” and almost all bacteria (“Slow” 2014). Rapid-sand filters, on the other hand, are also effective. With a one-time installation and low maintenance cost requirements, it proves to be economically viable as most sand filters range from \$10-60, and, obviously, quick for usage (“2.5 Filtration” n.d.). Scalability-wise, by the CDC, both sand filters have long lives (estimated >10 years), with no recurrent expenses in the slow-sand filter. It ultimately constitutes a great decentralized system.

Not a lot of studies exist that encompass the combination of some sustainable treatment methods (like the combination EC-sand filtration), as well as solar aspects, especially for rural regions that are in critical need for them but cannot afford traditional, technological systems

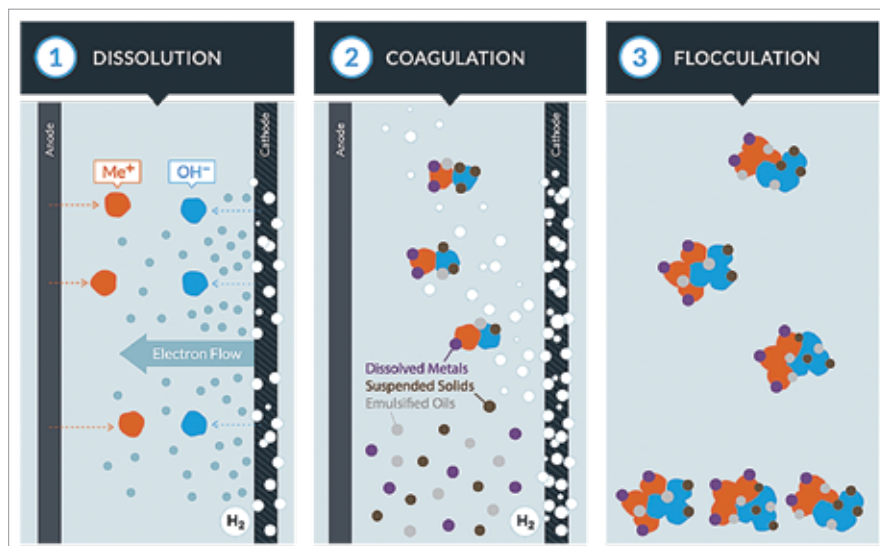


Figure 2.5: The schematics for EC (WaterTectonics, n.d.)

that would be seen in the United States for maximum and affordable effectiveness.

Cyanobacteria and algae in water and wastewater treatment

Blue-green algae, more commonly known as cyanobacteria, are found in all aquatic systems (“Cyanobacteria” 2016). It is often confused with green algae, which are known for their algal blooms. According to the EPA (2014), these typically occur from excess nutrients in the watershed. As the algae multiply at exponential rates in water, dissolved oxygen, pH, nitrate, and phosphate levels turn to levels that are unable to sustain fish or insect life. The resulting effect is a dead zone as a result of chemical-heavy fertilizers, treatment plants waste, and overall increased globalization and industrialization. Since both green algae and cyanobacteria can produce dense growth in water systems and cause odor and dissolved oxygen depletion, for the purpose of this research, they will be used comparably when it comes to considering the possible environmental impacts.

Unlike green algae, unmanaged cyanobacteria overgrowth (usually found in wastewater or commonly used yet polluted “water-holes” in some third-world countries) often can become poisonous and start releasing detrimental and hazardous cyanotoxins that can seriously damage human health and possibly lead to death when ingested. These toxins can

be produced by a multitude of planktonic cyanobacteria in eutrophic water bodies, such as the strain *Anabaena*, which was used in this research, since most studies have focused on *Microcystis*.

Unfortunately, due to the extremely poor, inefficient, or unsanitary practices (or a lack thereof) for retrieving and cleansing water to drink, a great portion of the human population cannot access drinking water sources within the proximity.

Rationale and hypothesis

The rationale of this lab was to determine which pH would provide the most optimal results for cleaner wastewater (cyanobacteria-contaminated) via solar-powered electrocoagulation and subsequent sand filtration. However, due to weather conditions, instead of a 10W polycrystalline solar panel, a 12V battery (that could produce the same energy output) was used instead. In a broader sense, this experiment had an intent to find a more sanitary, cheap, and sustainable method to possibly convert wastewater into potable water as a decentralized system. This would insure a safer future for an ecological community, allowing people to have more access to one of the world’s scarcest natural resources.

It was hypothesized that, both solar-powered electrocoagulation and electrocoagulation through DC power itself will be most optimal at a pH of 2 due to more hydrogen ions available to aid in the

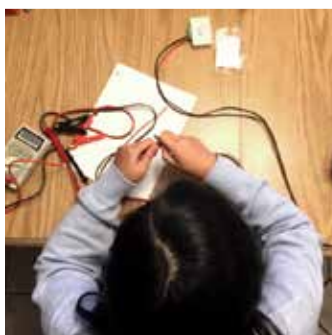


Figure 3.1



Figure 3.1.1



Figure 3.1.2



Figure 3.1.3

coagulation process. Additionally, it was hypothesized that simple slow-sand filtration will be less effective than EC, but still beneficial, as either secondary or primary treatment before electrocoagulation.

Methods

Solar-powered Electrocoagulation (SPEC) Setup

1. One 10W polycrystalline solar panel was obtained from a local science department store. The instructions located inside the box were followed to hook up the solar panel and load (multimeter) to their respective slots, using a small flathead screwdriver, on the given solar charge controller for initial voltage readings (see Figure 3.1).
2. On a partly sunny day with an outside temperature of 26°C, the panel was put outside in a constant spot (for each time this was tested) on an angle where sunlight was determined to be the most optimal. A warming period of 10 minutes was used.
3. After the warming period, readings of voltage and amperes were recorded, with the multimeter on the DC setting each time.
4. *It should be noted that due to winter weather conditions, the solar panel could not be utilized for the actual electrocoagulation. The usage and set-up is just a proof-of-concept. However, a 12V battery (methods below) was used in its place as both produce the same amount of output of energy.*

12V Battery EC

1. A 12V 50Ah lead-acid battery was purchased and kept until the start of experimentation in a room at a constant 21°C.

2. 150 mL of *Anabaena*-contaminated water and 50 mL of distilled water were added to a 250 mL beaker. (In the case of non-control (not pH of 4) trials, 0.05 M NaOH and 0.05 M HCl solutions were created via dilutions to buffer certain experimental solutions to a desired pH.)
3. A small sample (~10 mL) was removed to be sent through the turbidity meter and scanning spectrophotometer for initial readings (following the respective instructions). After these readings were taken the solution was returned to the beaker.
4. The beaker was placed on stirring plate set on lowest setting available and a magnetic stirring bar was placed in the solution at the bottom of the glassware in order to start the mixing.
5. Pre-cut aluminum electrodes (placed 2 cm apart in a cardboard template) were put on top of and into the beaker.
6. The cathode and anode were connected to positive and negative ends of the 12V battery through alligator wires and allowed to run for 15 min. before being removed from power source to take final data readings of the test water for turbidity and absorbance levels.

Sand filtration

1. Before the measurements could be taken the sand filter was constructed by layering large rocks, then smaller stones, then coarse sand, followed by extra fine sand in a cleansed juice jug with 2 coffee filters at the bottom.
2. 2 L of spring water were used to cleanse the filter prior to use.
3. The same type of 200 mL contaminated solution described in the EC section was tested for turbidity and sent through

the scanning spectrophotometer before being sent through the filter until enough solution was available for filtration.

4. Turbidity and spectrophotometric data was taken once again.
5. Between trials, 2 liters of spring water were sent through again in order to cleans the technology. See sand filter in Figure 3.1.1 and EC setup in 3.1.2 (solar panel power source) and 3.1.3 (12V battery power source).

Turbidity meter usage

1. The turbidity meter was calibrated according to the instructions provided using 0 ntu and 100 ntu solutions.
2. A container provided with the set was filled with 10 mL of the solution in question and was placed in the meter before pressing the test button.
3. The data was then recorded in the spreadsheets created for information collection.

Scanning spectrophotometer usage

1. The machine was calibrated with a "blank cuvette" full of distilled water according to the instructions provided inside the kit.
2. Enough solution was collected to practically fill the cuvette before being capped and wiped down with a lens cleaning cloth and placed in the slot.
3. The "record data" button was pressed and the graph produced was then transferred into a spreadsheet which was exported to the computers. [CS](#)

To read the full paper,
go to www.cswea.org.

GWS Corporate Donor Spotlight:

MSA MSA Professional Services, Inc.

Discussion with Gil Hantzsch

We recently sat down with Gil Hantzsch, CEO of MSA Professional Services, Inc. (MSA), to understand why he and his organization supports the goals and efforts of GWS. We met up with Gil at a small, local restaurant in Baraboo, Wisconsin – an establishment that seemed to embody his humble, down-to-earth demeanor. Our conversation ranged from his background at MSA to how his experiences align with GWS.

GWS: Tell us about yourself – Where did you grow up, what is your education, and how did you first get involved in wastewater?

Gil: I grew up in Hales Corner, Wisconsin, a suburb of Milwaukee. My father was a mechanical engineer, so I began my educational focus thinking I was going to be an engineer. I applied to UW-Madison, was accepted and started pursuing engineering. It turns out that after a few semesters in school I had changed my focus and was taking classes like literature, history, writing and environmental science. Classes that I would have never taken if I stuck with the engineering program. After going as far as changing my major to journalism, I got a little advice from my father and had to answer some tough questions about my future. Did I want to be a “writer that was good at math” or an “engineer that was good at writing”? I eventually chose engineering. As I worked my way through school, I took fluid mechanics, hydrologic engineering, sanitary engineering, and discovered my true passion – water and wastewater engineering. I could see a clear purpose for it and loved the application. Even though I struggled with abstract mathematics, a fluid mechanics problem is something I



“In a way we fly under the radar, but we are a group of humble, hardworking people. We do great things every day and no one is looking for recognition.”

could appreciate doing. After a short stint in the gas distribution industry, I decided to pursue an MBA degree. Before I even started, I realized I should be pursuing my passion. So I changed my focus again and pursued water and wastewater engineering. I graduated with a master’s degree and joined a team of full-service consulting engineers at MSA Professional Services (MSA). It’s been a winding path but it led me to where I was meant to be, and I’ve been here since 1992.

GWS: Tell us about MSA – What should people know?

Gil: In a way we fly under the radar, but we are a group of humble, hardworking people. We do great things every day and no one is looking for recognition. Our roots are in the Midwest, but last year we leapt out of our traditional geography and I think that trend will continue. We realize there are other areas of the country that need our services.

GWS: What contributions, achievements and accomplishments are you most proud of?

Gil: A few projects come to mind where I helped provide solutions for

small communities. In one case we helped a community construct a system that discharges to groundwater. The treatment solution included enhanced nitrogen removal, it protected the aquifer, avoided significant costs and was low-tech enough for part-time staff to successfully operate the plant. The project won an ACEC Engineering Excellence Award. The other case was for a Native American community where we provided a membrane bioreactor (MBR) system. It was the first MBR in Wisconsin and it accomplished the community's environmental stewardship goal to restore the environment to its original state.

On the non-engineering side of things, I am proud of the MSA Sewer User Charge Survey. I helped start it in 1996, and we have been conducting the survey ever since. The survey fills a void of education and public outreach

in the industry and helps answer the question: how much are you paying for sanitation compared to everyone else? It shows who is paying the most and who is paying the least. It's public education and gets people to understand the value of water. It's a national and global issue – what is the cost of water and who should pay for it?

GWS: In your opinion, what is the most important type of work GWS can provide?

Gil: Public education. As an engineer you need to couple your own education with appropriate communication skills. I appreciate that the students and engineers that work with GWS can do that. One of my messages when I talk to students is that being smart is not enough. You might have the best education in the world but if you don't couple it with good communication

skills, then it's hard to be effective. In the developed world where we typically take sanitation for granted, our communication efforts should focus on why the environment is important and how expensive it is to protect. If we can communicate that, then we typically allocate enough resources to protect it. In the undeveloped world, people need to understand the problem to allow GWS to help present the solutions. Public education needs to convey that proper sanitation is really important and it saves lives. We have the technologies to accomplish these goals and need to allocate enough resources because proper sanitation is a basic human right. No one should be put at risk for lack of sanitation.

GWS: What do you find most challenging about wastewater treatment?

"In the developed world where we typically take sanitation for granted, our communication efforts should focus on why the environment is important and how expensive it is to protect. If we can communicate that, then we typically allocate enough resources to protect it."




Stockbridge-Munsee WWTF, Port Byron, IL featured on the left. Check out www.msa-ps.com for more information.

Gil: I find that every site, effluent limit, I/I situation and client are challenging and more importantly interesting. Cookie cutter approaches don't work. It's great for an engineering to really understand the problem, the client, and what solutions make the most sense. From a GWS perspective, the engineers tailor solutions to the specific needs of the undeveloped area. We need to understand the clients' their abilities to operate the plant, what their goals are, where they discharge, what are the hazards and risks, and then come up with solutions for their specific situation. On top of that, you need to have the ability to communicate your understanding to recommend those solutions. All of it is challenging, but it's also fun and very rewarding.

GWS: What organizations do you personally support?

Gil: I live in the Baraboo Hills so the Baraboo Range Preservation Association is an important organization to me. This natural area is beautiful. I also support the International Crane Foundation. Their mission is to save cranes all over the world. They save habitat which is similar to what we do. I also support and participate in civic and school organizations. Currently, I'm helping UW-Platteville to develop a leadership and development program. STEM education with the Baraboo School District is also important to me. MSA's engineers have spent about 400 hours in their classrooms over the last three years. In short, I would say that we want to be present where future engineers are learning and honing in their skills to make this world a better place.

GWS: Why would a company like MSA support GWS? What motivates you to donate?

Gil: I've learned through my own life experiences and specifically leadership experiences, that no matter how small of a company you are a part of, we all have a role to play nationally and globally. For us to think that we are just a small firm in the Midwest is wrong. The country and the world are driven by people like us. This was driven home when I attended the American Council of Engineering Companies' Senior Executives Institute in Washington, D.C. We learned how the government works from the inside and how valuable our knowledge and subject expertise is within politics and that needs to be heard. They need to hear from us and they should hear from us. We are citizens of the country and the world; we can make an impact. Just because the bulk of our work is in the Midwest, we can have and should have an impact nationally and internationally. It should be one of our missions every day. GWS supports that mission. 



RHMG ENGINEERS



WASTEWATER COLLECTION AND TREATMENT | MAPPING AND GIS
MUNICIPAL ENGINEERING | STORMWATER MANAGEMENT
TRANSPORTATION | WATER SUPPLY, TREATMENT AND DISTRIBUTION
SITE DEVELOPMENT | CONSTRUCTION | INDUSTRIAL STORMWATER

Creative Engineering Solutions for 46 years

www.**RHMG**.com | rhmg@**RHMG**.com
975 CAMPUS DRIVE, MUNDELEIN, IL 60060 | 847-362-5959



Environment
Transportation
Energy
Facilities
Water

CDM Smith
SAFETY FIRST

Illinois | Minnesota | Wisconsin

listen. think. deliver.



91st Annual Meeting Submit for an Award

Our role in protecting the public and the environment are often undervalued and invisible to the very public that we protect. Whether in design, academia, equipment manufacture and supply, management, or operations, we all know individuals who have successfully addressed unique and challenging issues. Our awards program offers the opportunity to receive recognition for these deserving professionals.

A top priority of CSWEA each year is to recognize the efforts of our members and water and wastewater professionals at all levels. We also seek to provide top-quality nominees to the Water Environment Federation (WEF) each year for national level recognition. Sadly, in some years, many awards have few or no nominations, resulting in missed opportunities to provide recognition to deserving water quality professionals. It's time to brag a little bit about the accomplishments of our members. To nominate

someone is straightforward; fill out the nomination form with as much information as possible and submit it to CSWEA.

In order for you or a deserving colleague to be recognized, please submit a nomination to the Central States Water Environment Association and/or WEF for one of the many awards available.

Below is a listing of the award opportunities. Please carefully review the various awards available and nominate one of our many deserving members. Please note that award submittals need to be made by November 17, 2017 for awards presented by CSWEA to allow distribution to the respective CSWEA or WEF Awards Committees for consideration. CSWEA will present the winners with their awards at the 91st Annual Meeting Awards Banquet in May 2018, at the Drury Lane Theatre and Conference Center, Oakbrook Terrace, IL. WEF awards will be presented at WEFTEC 2018 in New Orleans.

2018 CSWEA & WEF Award nominations now being accepted

Nominations are now being accepted for the following WEF awards and should you be aware of a worthy nominee we ask that you please complete and return the bottom portion of this page for consideration. Note that it is OK to self-nominate. Each award is briefly described below and complete information may be found on the www.CSWEA.org or www.WEF.org websites.

WEF AWARDS presented at CSWEA Awards Banquet Arthur Sidney Bedell Award:

The Bedell is a federation award that is given annually to one recipient in recognition of outstanding achievement in the sewerage and wastewater treatment works field, as related particularly to the problems and activities of the member association. The Bedell Award Subcommittee selects the nominations, and the award is presented at the CSWEA Annual Meeting.

William D. Hatfield Award:

The Hatfield Award is a federation award given annually to one recipient in recognition of outstanding operation of a wastewater treatment plant. Each State Section may nominate one person per year and submit it to the Hatfield subcommittee. This award is presented at the CSWEA Annual Meeting.

George W. Burke Safety Award:

The Burke Award is made annually by WEF to a municipal or industrial wastewater facility for promoting an active and effective safety program. Each State Section Committee can nominate a facility and the nominations are then sent to the general awards committee. The winner will be presented with the Burke Safety Award at the CSWEA Annual Meeting.

Lab Analyst Excellence Award:

This is a WEF award that is given annually to one recipient in recognition of outstanding achievement in the area of water quality analysis. Each State Section Laboratory Committee may nominate one person. This award is presented at the CSWEA Annual Meeting.

CSWEA AWARDS presented at CSWEA Awards Banquet Radebaugh Award:

The Radebaugh Award is given to the author of a deserving paper presented at the previous year's annual meeting. The Radebaugh Award Subcommittee selects the winner from nominations received and the award is presented at the CSWEA Annual Meeting.

Operations Award:

The Operations Award is a Central States award that is given annually to one recipient in each state. The purpose of this award is to recognize operators of wastewater treatment facilities who are performing their duties in an outstanding manner and our demonstrating distinguished professionalism. The States Sections' Committee makes the selection and each State Section winner will receive the award at the CSWEA Annual Meeting.

Industrial Environmental Achievement Award:

The award is given at the CSWEA Annual Meeting to one industry per year in recognition of outstanding contributions in waste minimization, pollution prevention, environmental compliance, and environmental stewardship. Each State Section Industrial Committee may nominate one facility per year.

Bill Boyle Educator of the Year Award:

This award is given to one teacher per year in recognition of outstanding education assistance to students of any level in the study of the water environment. The award is presented at the CSWEA Annual Meeting.

Collection System Award:

This award is given annually to one member from each section in recognition of outstanding contributions in advancing collection system knowledge and direct or indirect improvement in water quality. Each State Section Collection System Committee can nominate one individual per year with the selected candidate receiving the award at the CSWEA Annual Meeting. The recipient of the Association Award shall be nominated annually for the WEF Collection System Award.

CSWEA Outstanding Young Professional Award:

This award is given annually to one member from each state section in recognition of the contributions of young water environment professionals to CSWEA and to the wastewater collection and treatment industry at the CSWEA Annual Meeting.

Academic Excellence Award:

The Academic Excellence Award is given to one student per year from each eligible institution in the state section hosting the Annual Conference. (Illinois is hosting the next conference.) An eligible institution shall be a college or university having a recognized graduate or under-graduate program in engineering as accredited by the Accreditation Board for Engineering and Technology. The candidate shall be selected by the department chair or other designated person at the eligible institution. Selected candidates are able to attend the CSWEA Annual Meeting with expenses paid, to receive their award and scholarship.

Central State Section Safety Award:

The CSWEA Facility Safety Award is made annually by CSWEA to a municipal or industrial wastewater facility within each State Section in recognition of active and effective safety programs from Burke Award submissions and the awards are presented at the CSWEA Annual Meeting.

Water Stewardship Award: This award recognizes and honors the contributions of an individual for outstanding humanitarian service to improving and sustaining our global water environment.

Sustainability + Green Infrastructure Award:

Established in 2017, this award recognizes and honors the contributions of an individual for projects at their organization that support sustainability in the water environment or make use of green infrastructure in the design of water reclamation facilities or in water treatment processes.

WEF AWARDS presented at WEFTEC

Charles Alvin Emerson Medal:

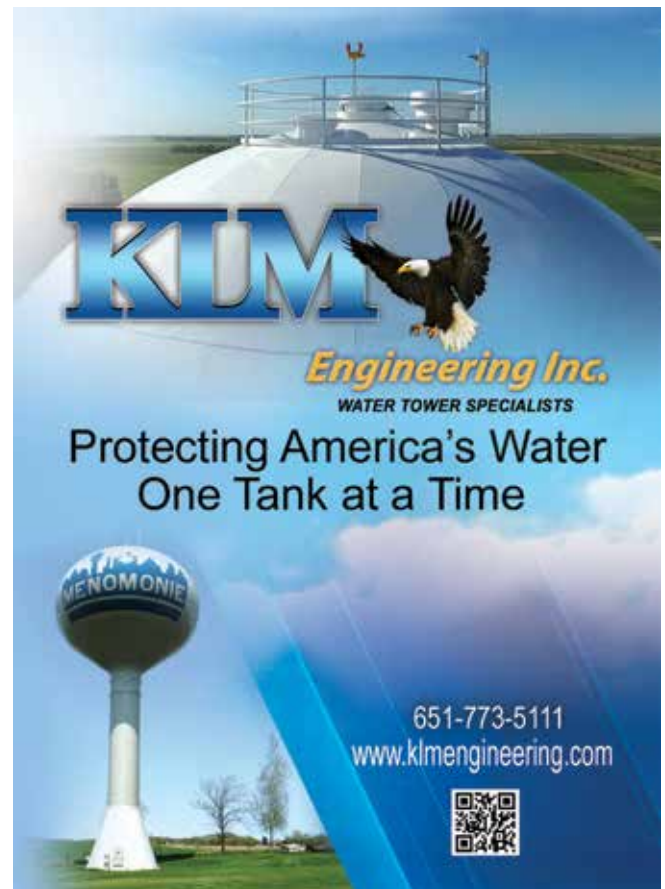
This award is presented by WEF to an individual whose contributions to the wastewater collection and treatment industry most deserve recognition. Areas of involvement include membership growth, water resource protection, improved techniques of wastewater treatment and fundamental research.

Harry E. Schlenz Medal:

This award is presented by WEF and recognizes the achievements of an individual outside of the water environment profession, who takes up the banner of environmental public education. This person is typically in the journalism, film or video production field.

Richard S. Englebrecht International Activities Service Award:

This award is presented by WEF and recognizes sustained and significant contributions to the furtherance and improvement of the activities of the Water Environment Federation in the international field.



Outstanding Achievement in Water Quality Improvement Award:

This award is presented by WEF and CSWEA to the water quality improvement program that best demonstrates significant, lasting and measurable excellence in water quality improvement or in prevention of water quality degradation in a region, basin or water body.

Gordon Maskew Fair Medal:

This award is presented by WEF and recognizes worthy accomplishments in the training and development of future sanitary engineers. Nominee must be a WEF member.

Public Education Awards:

There are three categories of Public Education Awards: Individual, Member Association and Other. The awards are presented by WEF and recognize significant accomplishments in promoting awareness and understanding of water environment issues among the general public, through the development and implementation of public education programs.

George Bradley Gascoigne Medal:

This award is presented by WEF to the author(s) of an article, which presents the solution of an important and complicated operational problem within a full-scale, operating wastewater treatment plant, which is appropriately staffed. Article must have been published in a federation or member association magazine/newsletter during the previous year.

Thomas R. Camp Medal:

This award is presented by WEF to a member who demonstrates a unique application of basic research or fundamental principles through the design or development of a wastewater collection or treatment system.

The Phillip F. Morgan Medal:

The Morgan Medal is awarded by WEF and recognizes valuable contribution to the in-plant study and solution of an operational problem. A published paper is not required.

The George J. Schroepfer Medal:

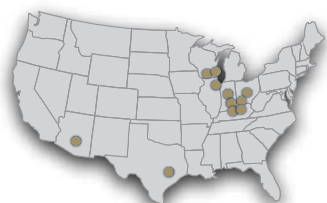
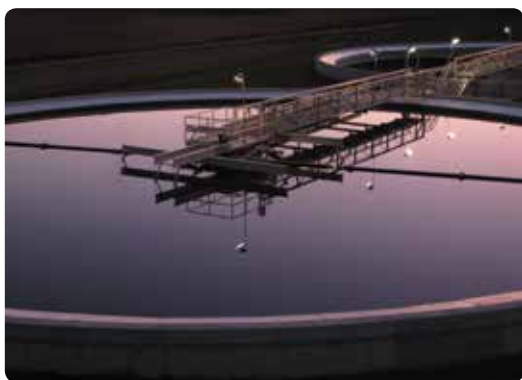
The Schroepfer Medal is awarded by WEF and recognizes a professional engineer for conceiving and directing the design of a project to achieve substantial cost savings or economic benefit over other alternatives, while achieving environmental objectives.

Member Association Safety Award:

This WEF award is presented to a member association to recognize the success of the safety programs in their local wastewater works. [CS](#)

Nominate for awards at
www.cswea.org/awards

Dedicated to Helping Our Clients Succeed Through Excellence in Engineering



www.strand.com | 608.251.4843

Full-Service Wastewater Engineering

Consistently ranked as a national leader in wastewater design, our 70+ years of experience provides our clients with a broad spectrum of expertise, real world project solutions, and fresh ideas for any size project.



Aviation • Buildings & Facilities • Green Infrastructure • Municipal • Transportation • Wastewater • Water Supply



USEMCO®

Custom Pump Stations & Controls



WISCONSIN

LW Allen
608.333.8622

ILLINOIS

Flo-Technics Inc
815.277.2600

ILLINOIS

Linden & Company
309.691.4811

ILLINOIS

Cogent/Vandevanter
636.717.2214

MINNESOTA

Minnesota Pump Works
507.645.8004

www.usemco.com

608.372.5911



Call for Abstracts

91st ANNUAL MEETING | May 14-17, 2018 | Drury Lane, Oakbrook Terrace, IL

This is a request for abstracts of papers to be considered for presentation at the 91st Annual Meeting of the Central States Water Environment Association, Inc., which will be held May 14-17, 2018 at Drury Lane Conference Center, 100 Drury Lane, Oakbrook Terrace, Illinois. To receive consideration, abstracts must be submitted online **before Wednesday, November 22, 2017.**

The theme for 2018 is **The Future of Water: Educate, Advocate, and Learn.** We are seeking speakers and abstracts covering new and innovative methods and strategies to enhance our industry!

The popular operations and utility management track will continue. Papers on troubleshooting, efficiency, optimization studies, case studies, and completed projects are of high interest. In addition to the operations and utility management track there will be a separate **Operations Focus Session** covering topics related to day-to-day wastewater operations.

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

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.

Papers on other subjects which you feel may be of interest to members are, of course, also welcome. All written papers submitted are eligible for the Radebaugh Award.

OPERATIONS and MAINTENANCE:

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

- Nutrient Removal
- Process Control
- Start-up Issues

UTILITY MANAGEMENT:

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

ENHANCED RESOURCE and ENERGY RECOVERY

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

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 and Combined Sewer Overflow Management

RESEARCH and 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 and Regulatory Issues

RESIDUALS, SOLIDS and BIOSOLIDS:

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

WATERSHEDS and

STORMWATER MANAGEMENT:

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

GENERAL:

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

SOFT SKILLS/LEADERSHIP:

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

To receive consideration, please submit your abstract via the online submittal process that can be accessed from the CSWEA website.

To submit your abstract, please go to www.cswea.org

and then to the 91st Annual Meeting Abstract Submittal area. Please contact me with any questions or problems that you encounter. Thank you.

Mark Eddington
Chair, Technical Program Committee
Kishwaukee Water Reclamation District
P.O. Box 624
DeKalb, Illinois 60115
Phone: 815-758-3513
Email: meddington@kishwrd.com

INSTRUCTIONS FOR THE SUBMISSION OF ABSTRACTS & CRITERIA FOR PAPER SELECTION

The Central States Water Environment Association (CSWEA) Technical program Committee has the responsibility for technical sessions at the Annual Meeting. Participants in any sector of the water environment field are cordially invited to submit abstracts for evaluation. The basis for selection will be the excellence of the abstracts as judged by the committee.

The abstract should be submitted online at www.cswea.org. Through the online submittal process, you will enter the title and abstract, import your credentials, choose your topic area, and select your presentation format. A summary of your abstract should be about 250-500 words. The full abstract,

including all tables and figures, must not exceed six (6) pages.

The presenting author of each abstract will be notified in February of the acceptance or rejection of the abstract.

The following should serve as a guide in the preparation of the abstract and will serve as a guide for the reviewers of the abstracts.

1. Originality and status of subject:

The paper should deal with new concepts or with new and novel applications of established concepts. It also may describe substantial improvements of existing theories or present significant data in support or extension of those theories. Studies of incomplete or ill-defined problem situations should be avoided. Previously published data should be introduced only in summary form and for comparative or supportive purposes.

2. Technical content:

A summary of the conditions under which data were obtained should be presented along with the methodology used. The conclusions should be presented in the abstract and should follow directly from the investigation or evaluation that was conducted. The abstract should substantiate that the project has been fully developed, that the theory or experimental procedure

has been firmly established, and that data have been collected and subjected to analysis. It should be evident that the abstract clearly describes the entire content of the conclusions of the paper to be presented.

3. Water environment significance:

The paper should relate clearly and significantly to the water environment field. Papers of a truly fundamental scientific nature are desired, but the author should make evident the relationships of the work to a practical problem area or situation in water quality and wastewater control.

4. Adequacy of abstract preparation:

The committee has noted that historically the adequacy of an abstract is often indicative of the quality of the final paper. As a result, authors are urged to prepare their abstracts with care, following the instructions noted above. As a reminder, an abstract is meant to summarize the presentation. The summary should include objectives, scope, and general procedures, insofar as the limited length of the abstract permits. An indication of results or conclusions is required. [CS](#)

Abstracts are due before
November 22, 2017.



Responsive partner.
Exceptional outcomes.

- WASTEWATER
- CIVIL/MUNICIPAL
ENGINEERING
- AIR QUALITY
& PERMITTING
- WATER RESOURCES
& STORMWATER

1-800-472-2232
wenck.com



LEADING CIPP SOLUTIONS SINCE 1993

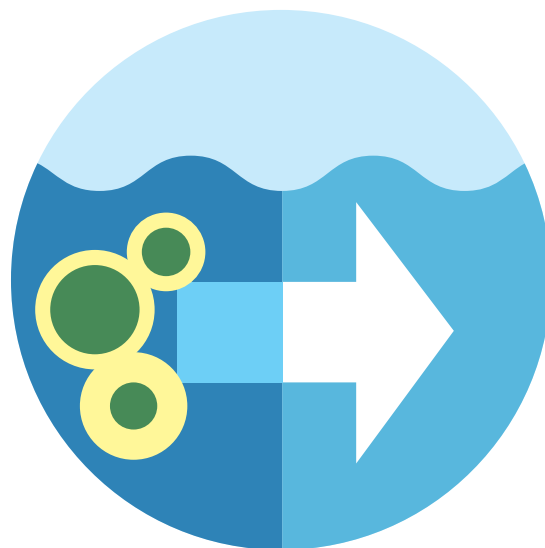
 INSIGNIA END SEAL®	 VAC-A-TEE™	 T-LINER®	 PERFORMANCE LINER®	 CIPMH	 PERFORMANCE LINER®
Gasket Sealing	Outside Cleanout	Main-To-Lateral Lining	Lateral Lining System	Full Depth	Sectional Spot Repair

To learn more, call or visit us at:
LMKTECHNOLOGIES.COM | 815.640.9302
info@lmktechnologies.com



Ruekert & Mielke, Inc.
will work with your community
to increase energy efficiency.

WAUKESHA, WI • KENOSHA, WI • MADISON, WI
CHICAGO, IL • GLOBAL WATER CENTER, WI
FOX VALLEY, WI • www.ruekertmielke.com



essential ingredients®

Engineers | Scientists | Consultants | Constructors
100% Environmental | Offices Nationwide | Employee Owned

©2016 Brown and Caldwell.

PROCESS EQUIPMENT REPAIR SERVICES - Our name says it all.

Our team provides equipment repair and rebuild services to the water and wastewater treatment industry. With over 30 years of experience, our staff has installed, rebuilt and/or repaired the following equipment:

- **Mechanical Bar Screens**
- **Conveyors**
- **Grit Removal Systems**
- **Clarifiers**
- **Aeration Equipment**
- **Trickling Filters**
- **Digesters**
- **Flocculators**
- **Sand Filters**
- **Screw Pumps**
- **Airlift Pumps**
- **Trash Rakes**
- **Traveling Water Screens**
- **Floatation Thickeners**
- **..... And More.**

We offer professional guaranteed service. We will provide a quotation including equipment requirements and a firm price for the project.

Our customized services allow you the option of having our trained staff work with your personnel to provide total turnkey service to complete your equipment installation, repair, or rebuild needs on a timely, competitively priced basis.

Contact Process Equipment Repair Services today, for all your equipment needs!

Phone 262-629-1059 • Cell 414-412-4403 • Fax 262-629-1059
Email PERSLaMont@aol.com

5991 Division Rd. • West Bend, WI 53095

**Process
Equipment
Repair
Services, Inc.**

Operations Challenge

WEFTEC 2017 will mark the 30th anniversary of the Operations Challenge competition. This year's competition will once again consist of five events that are designed to test the mental and physical abilities of the competitors. There are 10 Division I teams and approximately 30 Division II teams that compete annually from around the world in the contest many refer to as the "Wastewater Olympics."

The first day of the competition consists of the Process Control and Laboratory events. The Process Control event is a written wastewater exam. The exam consists of multiple choice, short answer math, and scenario questions as well as process control adjustments on a computer simulation program. Each question is given a point value based on difficulty and teams are given 20 minutes to earn as many points as possible. Then it is on to the Laboratory event. In this event teams are timed to see how fast they can properly analyze 12 samples for alkalinity and ammonia. Precision and proper lab procedures are very important in this event. WEFTEC judges watch each team to ensure that no mistakes are made. If a procedural error does occur, it results in penalty time being added to the team's final time.

Day 2 consists of the Safety, Maintenance, and Collections events. The Safety event is a simulated confined space rescue. In the Maintenance event, competitors conduct preventive maintenance on a trailer-mounted pump and place the pump into service as a backup lift station pump. Lastly, there is the crowd favorite Collections event. Teams simulate the repair of a broken 8" PVC sewer main and install a 4" sewer lateral connection to the repaired pipe with nothing but hand tools. These events are all timed, judged, and penalized similarly

to the Laboratory event. After all of the events are completed the scores are added up and the winners are announced. Last year the CSWEA Shovelers earned second place in Division II in the Process Event, third place in Division II for the Laboratory Event, and CSWEA also won the award for Best Fan Support. If you are going to be in Chicago for WEFTEC 2017, please stop by and support your CSWEA Operations Challenge teams.

2017 TEAM MEMBERS

CSWEA Pumpers


- Matt Streicher (Captain)
– Glenbard Wastewater Authority, IL
- Jerod Gable – City of Duluth, MN
- Brent Perz – Baxter & Woodman, IL
- Wade Lagle – Urbana & Champaign Sanitary District, IL
- Tom Dickson (Coach)
– Oconomowoc, WI

CSWEA Shovelers

- Jason Neighbors (Captain)
– Glenbard Wastewater Authority, IL
- Marc Zimmerman
– Janesville Wastewater Utility, WI
- Zach Matya – RJN Group, IL
- Luke Markko
– Village of Wauconda, IL
- Jim Miller (Coach)
– Wenck Associates, MN

This year will be Jim Miller's 30th year being involved with the CSWEA Operations Challenge teams. He has been gracious enough to have served the group in every facet available. First as a competitor, then as PWOD, and is currently serving as coach for the Shovelers. I would like to extend a very large thank-you to Jim from all of the CSWEA Operations Challenge family for everything he has done to build this event into what it is today. [CS](#)





10-YEAR WARRANTY

Stop Gambling

with your wastewater infrastructure.

REHAB & PROTECT AGING MANHOLES WITH SPECTRASHIELD


SpectraShield® Layers of quality, years of protection. GUARANTEED!

STOPS INFILTRATION | PREVENTS CORROSION

SpectraShield.com

ClarkDietz

Engineering Quality of Life™



WATER

INTEGRATED MANAGEMENT SOLUTIONS

GOOD FOR PEOPLE. GOOD FOR THE ENVIRONMENT.

WATER • WASTEWATER • STORMWATER

Illinois • Indiana • Wisconsin

clarkdietz.com



HRGreen

PROVIDING THE SERVICES WATER AGENCIES NEED FOR MORE THAN A CENTURY.

▷ 2550 University Ave West
Suite 400N
St. Paul, MN 55114

▷ Phone 651.644.4389

▷ HRCGREEN.COM

TRANSPORTATION + WATER + GOVERNMENTAL SERVICES + ENVIRONMENTAL + LAND DEVELOPMENT + ENERGY + CONSTRUCTION

2017 CSWEA/IWEA WEFTEC RECEPTION THANK YOU SPONSORS!



ABB
AE2S
AECOM
Applied Technologies, Inc.
Aqua Aerobics
Arcadis
Atlas Copco
Baxter & Woodman
Black & Veatch
Boerger, LLC
Boller Construction
Bolton & Menk
Brown and Caldwell
Burns & McDonnell
CDM Smith Inc.
Centrisys/CNP

CH2M Hill
Clark Dietz, Inc.
Craig Kelman & Associates
Crane Engineering
Crawford, Murphy & Tilly
Donohue & Associates, Inc.
Drydon Equipment, Inc.
Electric Pump
Energenec
Environmental Dynamics
Evoqua Water Technologies, LLC
Fehr Graham
Flow-Technics, Inc.
Greeley and Hansen
Grundfos
Howard R. Green Company

Hydro Inc.
IHC Construction Companies, LLC
In-Pipe Technology Company
Jim Jolly Sales-GA Industries
Kennedy Valve
LAI, Ltd.
Lakeside Equipment Corp.
LimnoTech, Inc.
LMK Technologies
Ostara
Peterson & Matz, Inc.
RedZone Robotics, Inc.
RHMG Engineers
RJN Group
Rotork Controls Inc.
RPS Engineering, Inc.

Ruekert & Mielke, Inc.
Short Elliott Hendrickson
Stewart Spreading
Strand Associates, Inc.
Trotter and Associates, Inc.
VAG - GA Industries
Veolia Water Technologies
Vessco Inc.
Visu-Sewer
VTScada by Trihedral
Wade Trim
Walker Process
Walter E. Deuchler Associates, Inc.
Weir Speciality Pumps (WEMCO)
Xylem Inc.

Experience You Can Trust

Support You Can Rely On



www.jdvequipment.com



2017 CSWEA BUYERS' GUIDE

Welcome to the annual *Central States Water Buyers' Guide*. When making purchasing decisions about products and services in the wastewater industry throughout the Central States region, please support the companies whose advertising makes *Central States Water* possible.

OUR CSWEA BUYERS' GUIDE CONSISTS OF TWO SECTIONS:

1. A **categorical listing** of products and services, including a list of companies which provide them.
2. An **alphabetical listing** of the companies appearing in the first section. This listing includes name, contact info, website, and more.

LISTINGS BY CATEGORY

Acoustic Pipe Inspection
InfoSense Inc.

Activated Carbon
CEI Carbon Enterprises Inc.

Aerators
Environmental
Dynamics International
Fluence

AMI/AMR
Sensus

Anaerobic Digestion
Olympus

Architecture
McMahon

Biogas Conditioning
Unison Solutions

**Chemical Processing
& Feed Systems**
Chemtrade Logistics
Crane Engineering
Energenex
Force Flow
Hawkins
Ostara
TGO Technologies, Inc.

**Chlorine and
Chemical Tank Scales**
Force Flow

CIPP
LMK

Clarifiers
Kusters Water

**Coatings, Lining &
Corrosion Control**
Bolton & Menk, Inc.
Hawkins
LMK
Process Equipment
Repair Services
SEH
Sekisui
SpectraShield Liner Systems

Contractors
Engineering America
Integrated Process
Solutions Inc.
Process Equipment
Repair Services

**CSO/SSO Controls,
Water Resources,
Distribution & Collection**
AECOM
Burns & McDonnell
CDM Smith Inc.
Donohue & Associates, Inc.
Engineered Pump
Greeley and Hansen
Hydro International
InfoSense Inc.
Integrated Process
Solutions Inc.
Ruekert & Mielke, Inc.
Strand Associates, Inc.
University of
Wisconsin-Madison
VEGA

Education & Training
University of
Wisconsin-Madison

**Electrical, Instrumentation/
Controls/Generators**
Baxter & Woodman, Inc.
Donohue & Associates, Inc.
Engineered Pump
Environmental
Dynamics International
Gasvoda Associates
Integrated Process
Solutions Inc.
LW Allen
Smith & Loveless
Starnet Technologies
Strand Associates, Inc.
Usemc
VEGA

Engineers/Consultants
Advanced Engineering and
Environmental Services, Inc.
AECOM
Baxter & Woodman, Inc.
Black & Veatch
Bolton & Menk, Inc.
Burns & McDonnell
CDM Smith Inc.
Clark Dietz, Inc.
Crawford Murphy & Tilly, Inc.
Donohue & Associates, Inc.
Energenex
Greeley and Hansen
HR Green, Inc.
Industrial & Environmental
Concepts (IEC)
KLM Engineering, Inc.
McMahon
RHMG Engineers Inc.
Ruekert & Mielke, Inc.
SEH

Strand Associates, Inc.
TKDA
Trotter and Associates, Inc.
Wenck

**Equipment Repair
& Rehabilitation**
Process Equipment
Repair Services

Filter Media
CEI Carbon Enterprises Inc.

Filtration
CEI Carbon Enterprises Inc.
Environmental Dynamics
International
Gasvoda Associates
Hydro International
Kusters Water
Smith & Loveless Inc.
Van Bergen & Markson

Floating Covers
Industrial & Environmental
Concepts (IEC)

Freshwater Remediation
Fluence

**Geographic
Information Systems**
Advanced Engineering and
Environmental Services, Inc.
Baxter & Woodman, Inc.
Bolton & Menk, Inc.
Burns & McDonnell
McMahon
RHMG Engineers Inc.
Ruekert & Mielke, Inc.
Wenck

Grit Removal Systems

Hydro International
Lakeside Equipment
Smith & Loveless Inc.

Hydrants

American Flow Control

Inspector/Locators

InfoSense Inc.

Level Instrumentation

VEGA

Manhole Rehab

InfoSense Inc.
LMK
SpectraShield Liner Systems

Meters/Meter Testing

Sensus
Starnet Technologies

Nutrient Recovery

Ostara

Odor Control Solutions

Brown and Caldwell
Chemtrade Logistics
Fluence
Hawkins
Industrial & Environmental
Concepts (IEC)
Kusters

Operation Services

Baxter & Woodman, Inc.
Brown and Caldwell
Engineered Pump
SEH

Package Pump Stations

Usemc

Pipe Repair

Hymax by Krausz
Sekisui

Pneumatic Valve Actuators

Kinetrol USA Inc.

Process Mechanical

Brown and Caldwell
CDM Smith Inc.
Donohue & Associates, Inc.
Engineered Pump
Fluence
Gasvoda Associates
JDV Equipment
Process Equipment
Repair Services
Strand Associates, Inc.
Van Bergen & Markson, Inc.

Pumps/Pump Systems

AECOM
Black & Veatch
Brown and Caldwell
Burns & McDonnell
Donohue & Associates, Inc.
Energenec
Engineered Pump
Gasvoda Associates
Hawkins
JDV Equipment
LW Allen
Smith & Loveless Inc.
Starnet Technologies
University of
Wisconsin-Madison
Usemc
Van Bergen & Markson, Inc.

Residuals/ Waste Management

Black & Veatch
Greeley and Hansen
Hydro International
Ostara

Safety Products

Force Flow
TGO Technologies, Inc.

Septage Receiving Facility

JDV Equipment
Lakeside Equipment

Storage Tanks/ Reservoir Systems

AECOM
Bolton & Menk, Inc.
DN Tanks
Engineering America
Greeley and Hansen
Industrial & Environmental
Concepts (IEC)
Pittsburg Tank &
Tower Maintenance Co.
SEH
Van Bergen & Markson, Inc.

Surveys

Advanced Engineering and
Environmental Services, Inc.
McMahon
RHMG Engineers, Inc.
Ruekert & Mielke, Inc.
Trotter and Associates Inc.
Wenck

Transfer Switches

Integrated Process
Solutions Inc.

Valves

AIRVAC
American Flow Control
Kinetrol USA Inc.

Water Quality Monitors

CEI Carbon Enterprises Inc.

Water Treatment Chemicals

Hawkins

Water/Wastewater Lifting Davits

Thern, Inc.

Water/Wastewater Treatment Systems

Advanced Aquacultural
Technologies
Advanced Engineering and
Environmental Services, Inc.
AECOM
Baxter & Woodman, Inc.
Black & Veatch
Bolton & Menk, Inc.
Brown and Caldwell
Burns & McDonnell
CDM Smith Inc.
CEI Carbon Enterprises Inc.
Chemtrade Logistics
Donohue & Associates, Inc.

Energenec
Engineered Pump
Environmental Dynamics
International
Fluence
Force Flow
Gasvoda Associates
Greeley and Hansen
Hydro International
Industrial & Environmental
Concepts (IEC)
JDV Equipment
Kusters
Lakeside Equipment
LW Allen
McMahon
Olympus Technologies, Inc.
Ostara
Process Equipment
Repair Services
Ruekert & Mielke, Inc.
SEH
Smith & Loveless Inc.
Starnet Technologies
Strand Associates, Inc.
TGO Technologies, Inc.
University of
Wisconsin-Madison
Van Bergen & Markson, Inc.

Client-focused,
Award Winning Designs
Water - Wastewater - Stormwater

- Facility Planning
- Design
- Construction Administration
- Operational Support

BAXTER & WOODMAN
Consulting Engineers
baxterwoodman.com



2017 CSWEA BUYERS' GUIDE

LISTINGS BY COMPANY

Advanced Aquacultural Technologies

PO Box 426
Syracuse, IN 46567
574-457-5802
advaquatechinc@gmail.com
www.advancedaquaculturaltechnologies.com

Advanced Engineering and Environmental Services, Inc.

4050 Garden View Drive, Suite 200
Grand Forks, ND 58201
701-746-8087
Charles.Vein@ae2s.com
www.ae2s.com



AECOM

303 E Wacker Drive, Suite 1400
Chicago, IL 60601
312-373-7700
askamericas@aecom.com
www.aecom.com

American Flow Control

PO Box 2727
Birmingham, AL 35202
800-326-8051
bmly@american-usa.com
www.american-usa.com



Baxter & Woodman Inc.

8678 Ridgely Road
Crystal Lake, IL 60012
815-459-1260
dwold@baxterwoodman.com
www.baxterwoodman.com

Black & Veatch

7760 France Avenue S., Suite 1200
Minneapolis, MN 55435
952-896-0500
froneksd@bv.com
www.bv.com

Bolton & Menk, Inc.

1960 Premier Drive
Mankato, MN 56001
507-625-4171
heidisle@bolton-menk.com
www.bolton-menk.com

Brown and Caldwell

30 7th Street E., Suite 2500
St Paul, MN 55101-2201
651-298-0710
dhenrichsen@brwnncald.com
www.brownandcaldwell.com

Burns & McDonnell Engineering Co.

1431 Opus Place, Suite 400
Downers Grove, IL 60515
630-724-3276
rpatchett@burnsmcd.com
www.burnsmcd.com



CDM Smith Inc.

330 E Kilbourn Avenue, Ste. 1149
Milwaukee, WI 53202
414-291-5100
mayerrij@cdmsmith.com
www.cdmsmith.com

CEI Carbon Enterprises Inc.

28205 Scippo Creek Road
Circleville, OH 43113
800-344-5770
sales@ceifiltration.com
www.ceifiltration.com

Chemtrade Logistics

90 E Halsey Road
Parsippany, NJ 07054
800-255-7589
water@chemtradelogistics.com
www.chemtradelogistics.com



Clark Dietz, Inc.

625 57th Street, 6th Floor
Kenosha, WI 53140
262-657-1550
info@clarkdietz.com
www.clarkdietz.com

Crawford Murphy & Tilly, Inc.

2750 West Washington
Springfield, IL 62702
217-787-8050
rarmouti@cmtengr.com
www.cmtengr.com

DN Tanks

4247 Grove Avenue
Gurnee, IL 60031
847-782-0357
jerry.myers@dntanks.com
www.dntanks.com

Donohue & Associates, Inc.

3311 Weeden Creek Road
Sheboygan, WI 53081
920-208-0296
info@donohue-associates.com
www.donohue-associates.com



Energenecs

700 E Milan Drive
Saukville, WI 53080
262-377-6360
doralee.piering@energenecs.com
www.energenecs.com



Engineering America

1822 Buerkle Road
White Bear Lake, MN 55110
651-777-4041
tbelden@engamerica.com
www.engamerica.com



**Environmental Dynamics
International**

5601 Paris Road
Columbia, MO 65202
573-474-9456
bryan.lushbough@wastewater.com
www.wastewater.com



Fluence

7135 Madison Avenue W.
Minneapolis, MN 55427
800-879-3677
info@fluencecorp.com
www.fluencecorp.com

Force Flow/Halogen

2430 Stanwell Drive
Concord, CA 94520
925-686-6700
info@forceflow.com
www.forceflow.com

Gasvoda Associates

1530 Huntington Drive
Calumet City, IL 60409
708-891-4400
jwytoicz@gasvoda.com
www.gasvoda.com



Greeley and Hansen

100 S. Wacker Drive, Ste. 1400
Chicago, IL 60606
800-837-9779
jsullivan@greeley-hansen.com
www.greeley-hansen.com

Hawkins Water Treatment Group

2381 Rosegate
Roseville, MN 55113
800-328-5460
customer.service@hawkinsinc.com
www.hawkinsinc.com



HR Green, Inc.

2550 University Ave. W, Suite 400N
St. Paul, MN 55114
651-644-4389
asumption@hrgreen.com
www.hrgreen.com



Hydro International

2925 NW Alcock, Suite 140
Hillsboro, OR 97124
866-615-8130
questions@hydro-int.com
www.hydro-int.com



Hymax by Krausz

331 SW 57th Avenue
Ocala, FL 34474
855-457-2879
info@krauszusa.com
www.krauszusa.com

Industrial & Environmental Concepts (IEC)

21390 Heywood Avenue
Lakeville, MN 55044
952-829-0731
anderson@ieccovers.com
www.ieccovers.com

InfoSense Inc.

8116 S. Tryon Street, Ste. B3-203
Charlotte, NC 28273
704-644-1164
achurchill@infosense.com
www.infosense.com

Integrated Process Solutions, Inc.

34696 412th Street SE, PO Box 26
Fosston, MN 56542
218-435-1703
ips@ipsamerica.biz
www.ipsamerica.biz



JDV Equipment Corp.

1 Princeton Avenue
Dover, NJ 07801
973-366-6556
sales@jdvequipment.com
www.jdvequipment.com



**PITTSBURG
TANK & TOWER
MAINTENANCE CO., INC.**

SAVE!
We have a crew in
YOUR AREA!

Inspections	Repair	New & Used	Tanks
Wet	In Service	Relocation	Elevated
Dry	Cleaning	Erection	Underground
ROV	Paint	Dismantles	Ground
	Insulation		

ROV inspections can be viewed on TV console during inspection & DVD provided. All inspections include bound reports, recommendations, and cost estimates.

Patrick Heltsley (270) 826-9000 x 4601 270-748-1325	Don Johnston (270) 826-9000 x 1001 270-748-1343
--	--

www.watertank.com



GLOBAL REACH AND EXPERTISE,
DELIVERED
THE WAY THAT'S RIGHT FOR YOU.

Black & Veatch offers global reach and expertise in every way that water is managed, sourced, conveyed, stored, treated and conserved, we deliver value for today and tomorrow.

Visit **bv.com** to learn more.



Kinetrol USA Inc.

1085 Ohio Drive
 Plano, TX 75093
 972-447-9443
scott.richardson@kinetrolusa.com
www.kinetrolusa.com

**KLM Engineering, Inc.**

PO Box 897
 Lake Elmo, MN 55042
 651-773-5111
smulhern@klmengineering.com
www.klmengineering.com

Kusters Water

101 Zima Park Drive
 Spartanburg, SC 29301
 800-264-7005
jim.weider@kusterszima.com
www.kusterswater.com

**Lakeside Equipment Corporation**

1022 East Devon Avenue
 Bartlett, IL 60103
 603-837-5670
sales@lakeside-equipment.com
www.lakeside-equipment.com

**LMK Technologies**

1779 Chessie Lane
 Ottawa, IL 61350
 815-640-9302
info@lmktechnologies.com
www.lmktechnologies.com

LW Allen, LLC

4633 Tompkins Drive
 Madison, WI 53716
 608-222-8622
jcook@wallen.com
www.lwallen.com

**McMahon**

PO Box 1025
 Neenah, WI 54957-1025
 920-751-4200
skundinger@mcmgrp.com
www.mcmgrp.com

**Olympus Technologies, Inc.**

PO Box 2326
 Eugene, OR 97402
 541-689-5851
info@oti.cc
www.oti.cc

**Ostara Nutrient Recovery Technologies**

690-1199 W. Pender Street
 Vancouver, BC V6E 2R1
 604-408-6697
info@ostara.com
www.ostara.com

**Pittsburg Tank & Tower Maintenance Co.**

PO Box 913
 Henderson, KY 42419
 270-826-9000
vcaudill@pttmc.com
www.watertank.com

Process Equipment Repair Services, Inc.

5991 Division Road
 West Bend, WI 53095
 414-412-4403
perslamont@aol.com

Process Equipment Repair Services, Inc.**RHMG Engineers Inc.**

975 Campus Drive
 Mundelein, IL 60060
 847-362-5959
info@rhmg.com
www.rhmg.com

Ruekert & Mielke, Inc.

W233 N2080 Ridegeview Pkwy.
 Waukesha, WI 53188
 262-542-5733
ramtmann@ruekert-mielke.com
www.ruekert-mielke.com

SEH

3535 Vadnais Center Drive
 St. Paul, MN 55110
 651-490-2000
mjensen@sehinc.com
www.sehinc.com

**Sekisui SPR Americas, LLC**

5000 Austell-Powder Springs Road
 Austell, GA 30106
 678-510-1820 ext. 216
info@sekisuispr.com
www.sekisui-spr.com

**Sensus, a Xylem brand**

8601 Six Forks Road, Ste. 700
 Raleigh, NC 27615
 800-638-3748
contactna@xylem.com
www.sensus.com

**Smith & Loveless Inc.**

14040 Santa Fe Trail Drive
 Lenexa, KS 66215
 913-888-5201
answers@smithandloveless.com
www.smithandloveless.com

**SpectraShield Liner Systems**

1494 Pleasant Hill Road
 Stoughton, WI 53589
 608-219-7969
rcotter@redhorseinc.net
www.spectrashield.com

Starnet Technologies

8520 Hollander Drive
 Franksville, WI 53126
 262-886-0228
sgrindeland@starnet-wi.net
www.starnettech.com

Strand Associates, Inc.

910 West Wingra Drive
 Madison, WI 53715
 608-251-4843
marketing@strand.com
www.strand.com

**TGO Technologies, Inc.**

3471 Regional Parkway, Ste. B
 Santa Rosa, CA 95403
 800-543-6603
sales@tgotech.com
www.tgotech.com

Thern, Inc.

5712 Industrial Park Road
Winona, MN 55987
507-454-2996
info@thern.com
www.thern.com

**TKDA**

444 Cedar Street #1500
St Paul, MN 55101
651-292-4400
leslee.leroux@tkda.com
www.tkda.com

Trotter and Associates, Inc.

40W201 Wasco Road, Ste. D
St. Charles, IL 60175
630-587-0470
s.trotter@trotter-inc.com
www.trotter-inc.com

**Unison Solutions, Inc.**

5451 Chavenelle Road
Dubuque, IA 52002
563-585-0967
sales@unisonsolutions.com
www.unisonsolutions.com

University of Wisconsin-Madison

432 N. Lake Street
Madison, WI 53706
800-462-0876
custserv@engr.wisc.edu
epd.wisc.edu

**Usemc**

PO Box 550
Tomah, WI 54660
608-372-5911
sales@usemco.com
www.usemco.com

**Van Bergen & Markson, Inc.**

9366 Deerwood Lane N
Maple Grove, MN 55369
763-546-4340
s.dyrud@vbminc.com
vbminc.com

VEGA Americas, Inc.

4170 Rosslyn Drive
Cincinnati, OH 45209
513-272-0131
Americas@vega.com
www.vega.com

**Wenck**

7500 Olson Memorial Hwy, Ste. 300
Golden Valley, MN 55427
763-252-6800
pdaniels@wenck.com
wenck.com



IN 1929, AMERICAN INVENTED THE MECHANICAL JOINT. TODAY WE BRING YOU ALPHA™

Few things in the waterworks industry have been as innovative as the Mechanical Joint. Times have changed. And so has AMERICAN. Introducing the AMERICAN Flow Control Series 2500 with ALPHA™ restrained joint ends. Now, you can use the same valve for ductile iron, HDPE, PVC, and even cast iron pipe. Unlike MJ, the restraint accessories come attached, leaving only one bolt on each end to tighten. That saves you time and money.

The AMERICAN Series 2500 with ALPHA™ restrained joint ends – it's the only gate valve you'll ever need.

ALMOST ANY MATERIAL.
NO TIME AT ALL.



AMERICAN
FLOW CONTROL
THE RIGHT WAY

www.american-usa.com
PO Box 2727, Birmingham, AL 35207 • Ph: 1-800-326-8051 • Fx: 1-800-610-3569
EOE/Vets/Disabilities
ALPHA™ is a licensed trademark of Romac Industries Inc. (U.S. Patent 8,894,100)

DUCTILE IRON PIPE FLOW CONTROL INTERNATIONAL SPIRALWELD PIPE STEEL PIPE

YP Brewers Outing



Water is essential. Treat it with care.

Lives depend on the proper treatment, storage and distribution of the water we drink and use. Our experienced team helps you complete your projects safer, faster and more efficiently using traditional or design-build project delivery methods, letting you focus on your customers.

Learn more about our capabilities at burnsmcd.com/CSW17.

BURNS MCDONNELL

CREATE AMAZING.



Offices Worldwide

One Company For All Your Filter Media

Anthracite
Greensand Plus
Sand & Gravel
Activated Carbon
Garnet
Calcite
Other Media Available
Filter media Testing
Filter Media Onsite Supervision
Removal and Replacement Consulting
Filter Media Consulting



800-344-5770
www.ceifiltration.com
info@ceifiltration.com



CHLORTAINER® TOTAL CONTAINMENT SYSTEM

**TOTAL CONTAINMENT
SYSTEM FOR CHLORINE
GAS & SULFUR DIOXIDE
TONS & 150s**

www.chlortainer.com
sales@tgotech.com
1-800-543-6603



CENTRAL STATES WATER

To reach water industry professionals in Minnesota, Illinois and Wisconsin through *Central States Water* magazine and its targeted readership, please contact Marketing Manager, Darrell Harris.

Toll Free: 877-985-9793
Toll Free Fax: 866-985-9799
E-mail: darrell@kelman.ca



KINETROL

Innovative Control Engineers since 1958



Kinetrol high performance pneumatic rotary actuators: Simply the best choice for quarter turn valve applications in your water or waste water plant.

Kinetrol invented the vane actuator concept back in 1960 and has been producing actuators that have proven themselves in the world's toughest applications ever since. Kinetrol is the world leader in vane type pneumatic actuators and Kinetrol actuators are known for trouble-free service life that span careers without maintenance.

When specifying pneumatic actuators for your ball, plug or butterfly application you will come across

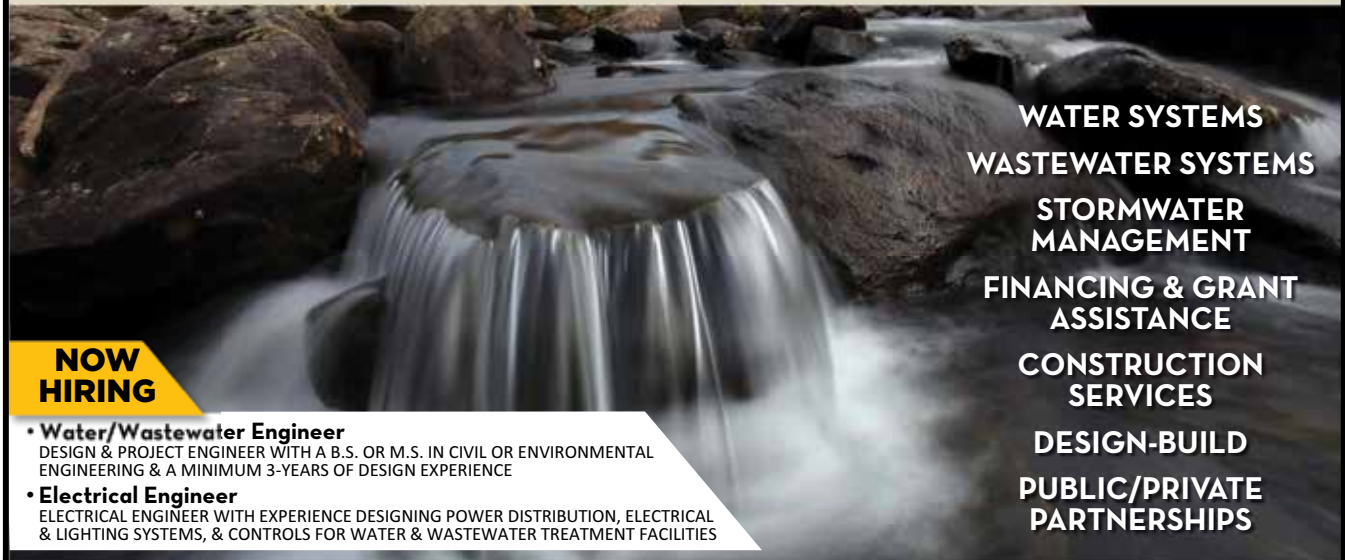
actuators that look similar to Kinetrol vane type actuators. Beware, these copy attempts are not the same! Kinetrol urges you to carefully evaluate details like materials of construction, quality control certification, Engineering capability, country of manufacture, reliability, size range, air consumption per stroke and, sales and service capability.

Kinetrol actuators and accessories are manufactured from foundry to finished product in our own ISO 9001-2008 audited factories in Farnham Surrey England and are compliant with AWWA standards including the latest, C541-2016 for pneumatic actuators.

Please call us, we'll be happy to explain the differences between Kinetrol actuators and all others.

Kinetrol USA, Inc. • www.kinetrolusa.com • (972) 447-9443

YOUR PARTNER IN PROTECTING OUR MOST PRECIOUS RESOURCE.



**NOW
HIRING**

- **Water/Wastewater Engineer**
DESIGN & PROJECT ENGINEER WITH A B.S. OR M.S. IN CIVIL OR ENVIRONMENTAL ENGINEERING & A MINIMUM 3-YEARS OF DESIGN EXPERIENCE
- **Electrical Engineer**
ELECTRICAL ENGINEER WITH EXPERIENCE DESIGNING POWER DISTRIBUTION, ELECTRICAL & LIGHTING SYSTEMS, & CONTROLS FOR WATER & WASTEWATER TREATMENT FACILITIES

WATER SYSTEMS
WASTEWATER SYSTEMS
**STORMWATER
MANAGEMENT**
**FINANCING & GRANT
ASSISTANCE**
**CONSTRUCTION
SERVICES**
DESIGN-BUILD
**PUBLIC/PRIVATE
PARTNERSHIPS**

McMAHON
ENGINEERS ARCHITECTS

NEENAH WI
MACHESNEY PARK IL
VALPARAISO IN

920 751 4200
MCMGRP.COM/CAREERS/
f t in y



We have the Knowledge, Experience, and Capabilities to Service all Types of Process Control Systems Regardless of Source or Manufacture.

Our Services Include, but are not Limited to:

Systems Integration
Industrial Process Automation
UL 508 Industrial Control Equipment
Lift Stations NEMA 3R/4X
Motor Control Centers (MCC)
Custom Motor Control Solutions
Variable Frequency Drives (VFD)
Instrumentation

Let Us Be Your Next Solution!

Corporate Office
34696 412th Street SE
Fosston, MN 56542
218.435.1703

Farmington Office
6145 235th Street W
Farmington, MN 55024
612.791.6998

Waunakee Office
606 Cooper Road
Waunakee, WI 53597
608.849.4375

www.IPSAmerica.biz





Calling All Operators!

By Zach Matyja

If you are reading this note, then odds are that you are NOT an operator... but I would love to see that change! Don't get me wrong, I love working, interacting, and mingling with fellow engineers, as well as all the managers, superintendents, and directors who make up CSWEA. That being said, I'd love to see a bit more involvement from the true "doers" in our profession.

The first lines on the WEF webpage are, "The Water Environment Federation is a not-for-profit association that provides technical education and training for thousands of water quality professionals who clean water and return it safely to the environment." The water quality professionals who actually do the cleaning and returning of the water are our plant and collection system operators, lab technicians, mechanics, maintenance technicians – the list goes on!

I had the pleasure to attend CSX, the Central States eXchange – a leadership planning event held in Wisconsin in July. Parts of our discussion centered on how we get operators more involved in our association's activities. I'd like to share a few of the ideas and opportunities that we have for operators (and non-operators alike) to become involved.

First, in Illinois, we are seeing hints of efforts from the IEPA to amend its rules governing wastewater treatment works operators. The change will more closely align the wastewater operator requirements with those of the public water supply operator program. One of the largest changes that this would bring is the potential requirement for wastewater operators to require continuing education and professional development as a part of their certificate renewal requirements. CSWEA recognizes that this would be a significant shift in the need for educational opportunities within the state geared toward wastewater operators. Stay tuned for new opportunities for training and education for operators from the state section. If you are interested in getting involved in the planning efforts related to this change, please reach out to Mohammed Haque



at mhaque@cswea.org or Paul Burris at Paul.Burris@elmhurst.org.

Second, I'm sure you all know that WEFTEC is again coming to Chicago. With the McCormick Center being the home of WEFTEC every other year, we are truly spoiled to have this great event in our backyard so often. I would encourage as many operators as possible to join us at the event. WEF has made it significantly easier and more economical for utility organizations to attend this great event with their Utility Partnership

Program (UPP). This great program is worth looking into for communities and districts looking to get more staff involved in WEF. If your operators haven't had a chance to walk the vast Exhibit Hall floor, check out the Operations Challenge, or attend the CSWEA WEFTEC Reception, make 2017 the year. For more information on the UPP program, visit www.wef.org and search UPP.

Finally, I mentioned in my last letter that I have a goal of getting more involvement from Central Illinois. We have made that opportunity a reality with our first-ever Central Illinois Collections and Operations Conference. The event will be held on October 26 in Bloomington, Illinois. Visit www.cswea.org/illinois for more information and to register. We are excited about this event and look forward to seeing some of our "downstate" operators attend.

If all that isn't enough, the Section does have an operations committee, and we are looking for some new members to get involved. Anyone interested can reach out to our current Chair, Jason Neighbors, at jneighbors@gbww.org.

So, if you are reading this note, and you're not an operator, consider sharing this issue of *Central States Water* with one you know, have them visit WEFTEC, join us in Central Illinois in October, or reach out to Jason to get involved. Central States appreciates everything they do for our industry and look forward to seeing more operators become involved in the future of our association. **CS**



**Comprehensive Services for Water,
Stormwater and Wastewater Infrastructure**

8790 Purdue Road | Indianapolis, IN 46268 | (317) 298-4500



The More Things Change...

By Jay Kemp

The sky is falling! Is the sky falling? Where is the sky? Does anybody know anything for sure? The turmoil in Washington and our national government is certainly a cause for uneasiness. The budget outline put out by the administration suggests a reduction in funding for environmental protection. Our industry is impacted more than most by threatened changes in environmental policy and funding.

The Clean Water Act was passed in 1972 and ushered in the most successful public works undertaking in the history of the planet: the reclaiming of our nation's waters. The improvement in water quality through the efforts of our industry has been of incalculable value to our communities. To continue to maintain this investment we need reliable funding for wastewater treatment, which has largely come from state revolving loan funds. These state funds are supported by federal grants and the federal contribution may be targeted for reduction. Each member of Central States should make a personal contact with their state and federal legislators to indicate support for continued funding of wastewater infrastructure and environmental science.

Central States, the Wisconsin Section and WEF are actively involved with taking our concerns to legislators in Washington through the annual fly-in. This year, eight individuals (maybe more) from Wisconsin participated in the fly-in meetings with key Senate and House staff. Efforts like the fly-in demonstrate the engagement with the legislative and regulatory process that impacts our industry. I believe this engagement will grow in importance.

Our ongoing work with our state regulators through our committees remains a mainstay. I believe the involvement of our membership creates better regulations and regulators.



The situations in Washington and in Wisconsin remind us that we are continually dealing with change. Often change is good, or if not always good then necessary. We don't submit many paper reports anymore, and the equipment and processes employed in wastewater treatment plants would not be recognizable to earlier generations of operators and engineers. But what doesn't change is the commitment by our members to improving our water environment.

Which brings me to the Annual Meeting – how was that for a segue? First of all: all Central States

members should make an effort to attend the Annual Meeting – it will be held in Illinois in 2018. At CSX this past July re-tooling of the Annual Meeting was discussed – gasp! Change the Annual Meeting format?! But I believe there was consensus that our signature event is overdue for some updating. Some things will not change: the preeminence of our Technical Program will be maintained and strengthened. But the sheer number of meetings and events can be exhausting and should be streamlined.

Central States remains incredibly active with many opportunities and benefits available. As I write this in early August, Global Water Stewardship is preparing to send a group of volunteers to Costa Rica. This fall brings WEFTEC back to Chicago – be sure to check out the joint CSWEA/IWEA reception on October 1. Marquette University is offering a two-day course on Emerging Contaminants in Water and Wastewater October 24 and 25 which is sure to present important information and bring awareness of new challenges to our industry. WI Section hosts the Operations Seminar on October 31 – with emphasis on energy and the Stormwater Webinar on November 14. Minnesota's always-topical Conference on the Environment is November 8. So no reason not to get involved and take advantage of these learning and networking opportunities. **CS**

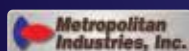
MEETING ALL OF YOUR NEEDS UNDER ONE ROOF.



WE WORK FOR YOU BECAUSE WE WANT YOUR PROJECT TO SUCCEED.

At Metropolitan Industries, our sales teams, engineers, service, logistics, and fabrication teams work together seamlessly to create the most efficient, Pumping and Control

Systems for your needs. From conception to design to installation, our totally integrated pump packages are tested and developed with our end users in mind.



Learn how we can work for you
815-886-9200 or metropolitanind.com

Join us at one of our
seminars this fall:
metropolitanind.com/training



MONITOR AND CONTROL FOR MUCH LESS

\$0 On upfront licensing costs
\$0 Integration costs on MetroCloud
ready products

\$0 Annual support costs
Get fully integrated SCADA features
with the latest security updates without
spending a fortune.

LEARN MORE AT METROCLOUD.US



Working Together

By Timothy Wedin

I recently had the privilege of attending the Central States Exchange, and met with professionals from Minnesota, Wisconsin, and Illinois to talk about the direction that CSWEA is moving in.

This is an annual event, which gives the three member associations that make up Central States an opportunity to get together and talk about the organization, and what our different sections are doing through the year. As we shared information about our activities, how we were working to grow the organization, how we were working to inform the public, and how we were working to provide valuable information to our members, I noticed a common thread in our methods. All of us recognize the value of working with other like-minded organizations to help our members stay informed.

In the Minnesota Section, one of the most visible examples of this is the Conference on the Environment. Every year, we team up with the Air and Waste Management Association (AWMA) to cohost this conference. Conference presentations include topics like Resource Recovery, Stormwater Management, Air Dispersion Modeling, Emerging Technologies, and Regulatory Issues. Every year, our two organizations collaborate to plan a high-quality conference that provides attendees with educational and networking opportunities. It has been so popular that it has grown from being held at a small hotel near the airport to being held at the Minneapolis Convention Center. The 32nd Annual Conference on the Environment will be held on November 8. Please plan on attending!

We also team with the Minnesota Wastewater Operators Association (MWOA) to host several conferences and seminars throughout the year. The next of these will be the Collections System seminar to be held in September at the Western Lake



Superior Sanitary District in Duluth. Our Collections Committee is busy working with the MWOA to hold a seminar to discuss issues related to the collection of wastewater, and the challenges that can go along with that. By the time you have read this, we will have finished with this seminar, and will be working on the next, to be held in January in Eagan. Be on the lookout for more information!

MWOA also teams with us to hold the annual Innovative Approaches to Wastewater Operational Problems Seminar in St Cloud. This year will mark the

35th anniversary of this seminar, which will be held in February. The seminar covers issues related to the operation and maintenance of treatment and collection systems, and focuses on novel and inexpensive ways that operators have found to improve their treatment facilities and collection systems. One of the highlights of the seminar is the five-minute presentations by operators about quick timesavers that they have used in their systems. In the past, these presentations have ranged from quick fixes to prevent warping of check valves in air systems, to constructing simple pieces of equipment to help with sampling. The Operations Committee works with MWOA to help identify operators who would be good presenters for this Seminar. Contact the Operations Committee if you have ideas for presenters!

As we have continued to grow, we have remained focused on our section's objectives: to encourage and coordinate a friendly exchange of information and experiences while advancing knowledge of design, construction, operation, and management of water and wastewater collection and treatment facilities within the state. Our continued collaboration with AWMA and MWOA, as well as other organizations, will allow us to provide the high-quality events that you have come to expect. **CS**

Innovative and Sustainable Water/Wastewater Supply, Treatment, Reclamation, and Reuse



Engineering + Architecture + Planning | Saint Paul • Duluth

OCTOBER

IL Section Business Meeting

October 17
Reserve 22
Glen Ellyn, IL

Emerging Contaminants In Water And Wastewater

October 24-25
Marquette University
Milwaukee, WI

IL Collections and Operation Seminar

October 26
Bloomington Police Department
Bloomington, IL

Resource Recovery & Operations Seminar With Energy Focus

October 31
Lussier Family Heritage Center
Madison, WI

NOVEMBER

32nd Conference On The Environment

November 8
Minneapolis Convention Center
Minneapolis, MN

2017 Mwrdr Mainstream Pumping Station & McCook Reservoir Tour & Lunch

November 9
Hodgkins, IL

WI Stormwater And Watershed Webinar

November 14
Global Water Center
Milwaukee, WI

JANUARY 2018

Executive Committee Meeting

January 18-19
Hilton Suites
Oakbrook Terrace, IL

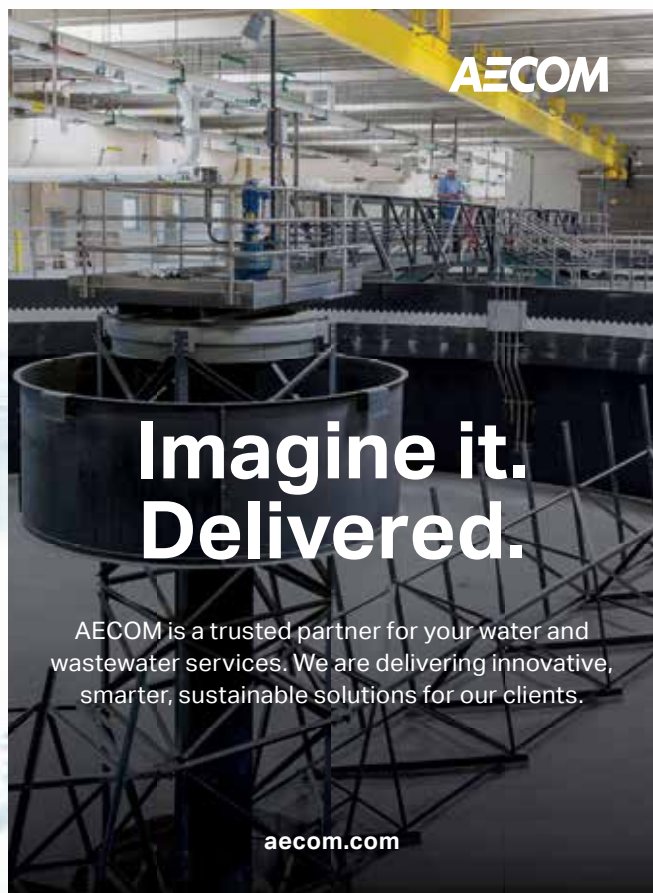
Collections Workshop (w/MWOA)

January 24
Mces Regional Maintenance Facility
Eagen, MN

FEBRUARY 2018

WEF YP Summit 2018

February 19-20
San Antonio, TX



AECOM

Imagine it. Delivered.

AECOM is a trusted partner for your water and wastewater services. We are delivering innovative, smarter, sustainable solutions for our clients.

aecom.com

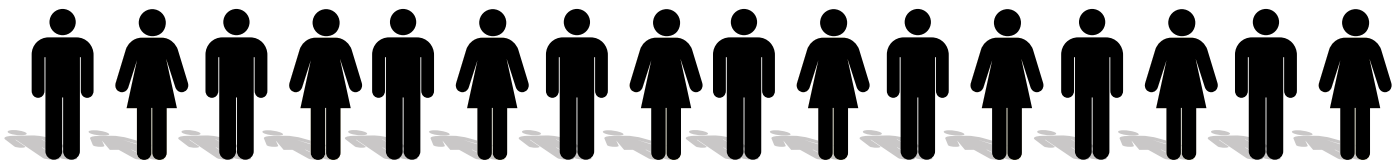


Van Bergen & Markson, Inc.

Environmental Process Equipment for Water & Wastewater Treatment

- Aeration •Biosolids •Blowers •Chemical Feed
- Clarification •Dewatering •Digestion
- Disinfection •Filtration •FRP •Grit Removal
- Instrumentation •Mixers •Odor Control
- Pumping Equipment •Screens
- Sludge Handling •Solids Reduction
- Ultrafiltration

• Minneapolis, MN • Appleton, WI
info@vbmnc.com
phone: 763-546-4340 Toll Free: 800-422-0791



CSWEA Welcomes Our New Members

Updated on September 26, 2017

July 2017

Tim Leach, Greater Peoria Sanitary District
Ed Cramer, CMT
Ronald Kau, Evoqua Water Technologies
Caroline Patnode, Xylem-Sanitaire
Brian Mehr, GNP-Pilgrims
Adam Jasinski, City of Naperville
Amy Ries, City of Naperville
Dave Green, Fox River WRD
Amanada Kaminski, City of Racine
Stephanie Johnson,
Mississippi Watershed Mgmt. Org
Greg Patterson, Willow Industries
Michael McKinney
Megan Wolfe, UW-Platteville
Erin Abramson, City of Superior
Matt Gsellmeiner, MCEs
K. Gali, City of Naperville
Calli Karter, Mortenson Safar Kim
Jay Dahlberg, DuPage County Public
Works Department
Dorie Yontz, Dow Chemical
William Lahvic, Clearbrook Inc.
Anna Spektor
Brandon Hungelmann-Skiba
Daniel Haick, Fox Metro WRD
Michael Wegner, Brown and Caldwell
Gage Grunst
Haley Mohr
Hieu Nguyen

Jordin Weisz
Kevin Dougherty, Fuel Tech, Inc.
Steven Miller, City of Effingham
Forrest Kelley,
Capitol Region Watershed District
Chad Giackino, Heart of the Valley MSD
Abby Bernhagen,
MSA Professional Services, Inc.
Levi Peterson
Andrea B. Crouse
Maxwell Vogel
Reilly Olinger
Rohan Patel
Ryan Ziegler
Smita Nayak
Patrick Mullen, CNP Technology
Water & Biosolids Corp.
Gregory Epping, Village of Darien
Joshua Steffek
Andrew V. Szymaszek
Linjie Tang
Catherine Terando, UW-Platteville

August 2017

Mike Dacka, Fox River WRD
Bryan Goehring, WW Goetsch Associates
Lisa Goddard, City of Minneapolis
Kelly Moriarity, City of Minneapolis
William D. Walker, Madison MSD
Jake Kehring, Green Bay MSD

Chris Mortenson, Mortenson Safar Kim
Xiaoru Guo
Rebecca Alm
Alexis McAdams,
UWM School of Freshwater Sciences
Anne Crotteau, Baxter & Woodman
Megan Levy,
WI Office of Energy Innovation
Adam Shelton,
Foth Infrastructure & Environment
Christopher Fox, Waterch of America
Maria Tieg
Joseph Solita,
Glenbard Wastewater Authority
Phillip Dziewior,
Glenbard Wastewater Authority
Brent Brown, CH2M
Lila Gillespie
Carmen Aguilar, UWM School of
Freshwater Sciences
Anuja Patil
Amanda Schiller
Morgan Andritsos
Jessica Roeder
Kimberley Seidemann
Gwendolyn Fisher
Heather Koehn, UWM School of
Freshwater Sciences
Mark Lundgren,
MSA Professional Services

Managing a most important asset.
Supplying for the future.
Building a legacy - *your* legacy.

WSB
wsbeng.com

**One size fits all – doesn't.
And neither do our solutions.**

We treat every client, location,
and project as unique and let
collaboration lead us to the right
solution.

**BOLTON
& MENK**
Real People. Real Solutions.

Bolton-Menk.com

ADVERTISER INFORMATION CENTER

COMPANY	PAGE	TELEPHONE	WEBSITE
Advanced Aquacultural Technologies, Inc.	29	574-457-6193	www.advancedaquaculturaltechnologies.com
Advanced Engineering and Environmental Services (AE2S)	6	763-463-5036	www.ae2s.com
AECOM	68	312-373-7700	www.aecom.com
AMERICAN Flow Control	61	205-325-7701	www.american-usa.com
Baxter & Woodman, Inc.	57	815-459-1260	www.baxterwoodman.com
Black & Veatch	59	952-896-0500	www.bv.com
Bolton & Menk, Inc.	69	507-625-4171	www.bolton-menk.com
Brown and Caldwell	52	651-298-0710	www.BrownandCaldwell.com
Burns & McDonnell	62		www.burnsmcd.com
CDM Smith	45	651-772-1313	www.cdmsmith.com
CEI Carbon Enterprises, Inc.	63	800-344-5770	www.ceifiltration.com
Chemtrade Logistics	18	866-887-8805	www.chemtradelogistics.com
Clark Dietz, Inc.	54	262-657-1550	www.clark-dietz.com
Crawford, Murphy & Tilly, Inc.	65	217-787-8050	www.cmtengr.com
DN Tanks	12	847-782-0357	www.dntanks.com
Donohue & Associates, Inc.	OBC	920-208-0296	www.donohue-associates.com
Energenecs	26	800-343-6337	www.energenecs.com
Engineering America	32	651-777-4041	www.engamerica.com
Environmental Dynamics	8	573-474-9456	www.wastewater.com
Fluence	16	763-746-8400	www.fluencecorp.com
Force Flow	19	800-893-6723	www.forceflow.com
Gasvoda and Associates	IBC	708-891-4400	www.gasvoda.com
Greeley and Hansen	9	800-837-9779	www.greeley-hansen.com
Hawkins Water Treatment Group	12	800-328-5460	www.hawkinsinc.com
HR Green, Inc.	54	800-728-7805	www.hrgreen.com
Hydro International	17	866-615-8130	www.hydro-int.com
HYMAX by Krausz	25	855-4KRAUSZ	www.krauszusa.com
Industrial & Environmental Concepts, Inc.	10	952-829-0731	www.ieccovers.com
InfoSense, Inc.	25	877-747-3245	www.infosense.com
Integrated Process Solutions, Inc.	64	218-435-1703	www.ipsamerica.biz
JDV Equipment Corporation	55	973-366-6556	www.jdvequipment.com
KINETROL USA	63	972-835-7917	www.kinetrolusa.com
KLM Engineering	47	888-959-5111	www.klmengineering.com
Kusters Water	11	800-264-7005	www.kusterswater.com
Lakeside Equipment Corporation	IFC	630-837-5670	www.lakeside-equipment.com
LMK Technologies	51	815-433-1275	www.lmktechnologies.com
L.W. Allen, Inc.	39	608-222-8622	www.lwallen.com
McMahon Associates, Inc.	64	920-751-4200	www.mcmgrp.com
Metropolitan Industries	66	815-886-9200	www.metropolitanind.com
Olympus Technologies, Inc.	31	541-689-5851	www.oti.cc
Ostara Nutrient Recovery Technologies	24	604-408-6697	www.ostara.com
Pittsburg Tank & Tower	59	270-826-9000	www.watertank.com
Process Equipment Repair Services, Inc.	52	262-629-1059	
RHMG Engineers, Inc.	45	847-362-5959	www.rhmg.com
Ruekert & Mielke, Inc.	52	262-542-5733	www.ruekertmielke.com
Sekisui SPR Americas, LLC	3	614-634-2291	www.sekisui-spr.com
Sensus	17	763-856-0110	www.sensus.com
Short Elliott Hendrickson (SEH)	35	651-490-2030	www.sehinc.com
Smith & Loveless Inc.	25	704-844-1100	www.smithandloveless.com
Spectrashield Liner Systems	54	800-284-2030	www.spectrashield.com
Starnet Technologies	23	262-886-0228	www.starnettech.com
Strand Associates, Inc.	48	608-251-4843	www.strand.com
TGO Technologies	63	800-543-6603	www.tgotech.com
Thern, Inc.	37	507-454-2996	www.thern.com
TKDA	67	800-247-1714	www.tkda.com
Trotter & Associates Inc.	21	630-587-0470	www.taiengr.com
Unison Solutions, Inc.	12	563-585-0967	www.unisonsolutions.com
University of Wisconsin-Madison	3	800-783-6526	www.epd.wisc.edu/cswea
USEMCO, INC.	49	608-372-5911	www.usemco.com
Van Bergen & Markson, Inc.	68	800-422-0791	info@vbminc.com
VEGA Americas, Inc.	4	513-272-0131	www.vega.com
WENCK	51	763-252-6800	www.wenck.com
WSB & Associates, Inc.	69	763-541-4800	www.wsbeng.com

Central States Water would not be possible without the advertising support of these companies and organizations. Please think of them when you require a product or service. We have endeavored to make it easier for you to contact these suppliers by including their telephone numbers and, where applicable, their websites. You can also go to the electronic version of **Central States Water** at www.cswea.org and access direct links to any of these companies.



BEFORE



AFTER



ADD A CONDITIONING PUMP TO THE MIX

The Vaughan Conditioning Pump is a Vaughan Submersible Chopper Pump mounted on a portable stand and fitted with a high-velocity mixing nozzle. The Conditioning Pump recirculates wet wells, chopping and mixing to produce a homogeneous slurry that is more easily pumped out. Floating mats are removed and solids that have accumulated on the floor are re-suspended. Being portable, it can be used in multiple applications at a single job-site, facility or municipality. In one recent project, the Vaughan Chopper Pump paid for itself in 2.5 months. Contact us to see what we can do for you.

APPLICATIONS

- Lift Station Conditioning
- Basin Conditioning
- Influent Station/Channel Conditioning
- Holding Tank Conditioning
- Digester Cleanout/Homogenization

For more information contact your local representative:

GASVODA & ASSOCIATES, INC.

1530 Huntington Drive, Calumet City, IL 60409

Ph: 708-891-4400 | Fax: 708-891-5786 | E-mail: info@gasvoda.com



 **Chopper**

ChopperPumps.com

NUTRIENT REMOVAL



OPTIMIZATION



EFFICIENCY



REHABILITATION



Donohue & Associates has been practicing our client-focused brand of engineering services since 1997 with a reputation for expertise, quality, and service.

Illinois • Indiana • Michigan • Minnesota • Missouri • Wisconsin

donohue-associates.com

CELEBRATING
20
YEARS