CENTRAL STATES WATER

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

PLANT PROFILE

GREEN BAY
Metropolitan Sewerage District

Central States Water Environment Association
3809 Shenandoah Dr. Crystal Lake, IL 60012
ADDRESS SERVICE REQUESTED

Water Environment Federation®
Preserving & Enhancing the Global Water Environment

One of two 32 MG tanks for the City of Syracuse, NY; Engineering by CH2M HILL

When we broke ground on these tanks in Syracuse, it was sunny…

But then, New York weather changes day to day

Good thing weather doesn't slow DYK construction crews down. So, whenever you are ready to break ground, your tank will be built on time to the quality standards DYK is known for.

Photography Reece, Syracuse, NY

- Water storage, wastewater or thermal energy storage tanks from 100,000 gallons to 40,000,000 gallons
- Buried or disguised
- Architecturally treated or plain

All built to last for over 100 years with little to no maintenance. Owners in New York recently trusted DYK with 94.0 MG of their water. How many gallons can we store for you? Sunny weather not required.

Call us today 1-800-227-8181 or visit www.dyk.com

DYK® INCORPORATED

Building Lifetimes of Value Today

Click HERE to return to Table of Contents

IN THIS ISSUE

FEATURES

DEPARTMENTS

Messages

CSWEA News

Section News

Published by:

Craig Kelman & Associates

Tel: (866)985-9780 / Fax: (866) 985-9799
www.kelman.ca
Managing Editor: Cheryl Parisien, cheryl@kelman.ca
Design/Layout: Tracy Toutant
Advertising Sales: Al Whalen, awhalen@kelman.ca
Advertising Co-ordinator: Lauren Campbell
Federal tax# 23-7378788

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 Eric Lecuyer, cswea@ymail.com

Send undeliverable addresses to: CSWEA, 3809 Shenandoah Dr., Crystal Lake, IL 60012

This magazine is printed with vegetable oil-based inks and consists of recycled paper provided by a Forest Stewardship Council (FSC) certified supplier. Please do your part for the environment by reusing and recycling.

THINK GREEN

Administrative Year 2010-11

It's not just the purchase. It's the service after the sale.

It's the Flygt difference.

When it comes to the finest Flygt products and services, your best source by far is ITT. Our pumps, mixers and aerators have long set the industry standard. Plus, that same Flygt quality extends to system monitoring and control, bypass and dewatering equipment, and all kinds of retrofits.

But we're not just about impeccable product quality alone. In fact, the key to the Flygt difference is the service and support we provide long after the sale has been made.

For consulting engineers and plant operators, your stream of Flygt advantages begin with state of the art product design and innovative engineering. What's more, our products are delivered by teams of experienced professionals. Their expert system design ensures that our products are paired most efficiently with your specific applications.

Along the way, we offer the industry's largest network of skilled service facilities, so onsite help is nearby and ready 24/7, should you ever need it.

For over 50 years, Flygt Products have been acknowledged as the industry leader in America. It's no accident. The Flygt difference is this: We stand by our products and our customers.

For full details on what Flygt can do for you, contact your Flygt Product sales-person in WI: 262-544-1922, fax 262-544-1399,
ITT Water & Wastewater
Flygt Products
N27 W23291 Roundy Drive,
Pewaukee, WI 53072
or in IL: 708-342-0484; Fax 708-342-0491
ITT Water & Wastewater - Flygt Products
8402 West 183rd Street, Ste. A,
Tinley Park, IL 60477
Visit us at: www.us.ittwww.com

Engineered for life

ITT

Looking to the Future

By Jim Miller

I trust that all of you who made it to Madison for the 83rd Annual Meeting have made it safely back to your respective states. The committees that pulled together this year's conference did another great job. Thank you to all of you who contributed to this conference.

Speaking of contributing – committee members and executive board members will be meeting in July at CSWEA-CSX'10 (July 15 & 16 at the Kalahari Resort) to discuss ways to improve the association and will also likely be attacking the budgetary issues facing the CSWEA. This is your opportunity to help improve your association, so if you have concerns or areas where you think we can improve, or maintain the level of service you receive from the association, please pass them along to your respective State Section representatives or one of the executive board members for further discussion at this year's CSX. Thanks also to Eric Lecuyer (and family) for the fine job at this conference and throughout the year.

I mentioned very briefly at the annual banquet that I was looking for ways to expand and improve efforts to bring more meaningful exchange for our operations, maintenance, collection, lab, engineers and young professionals. I am serious about finding better ways to get more people involved in the organization. I believe one of the ways is to provide educational opportunities to help improve our performance in those areas. We need to make certain that we have at the state and association level – conferences and workshops that can benefit our members existing and prospective members. Working with a number of engineering firms, I have heard that there isn't much to offer to new engineers that will help them with their duties and career. I hear similar comments from operations, maintenance, collection, and lab folks as well. We have had a number of very informative workshops like the digester foaming topics this spring. That is why I am seeking to continue that Ad Hoc Committee another year to continue to find ways to assist our members with those issues. I would encourage all of you to think of ways that we can provide timely and meaningful information to our members. Having made my way up the ladder from small WWTPs to larger ones and then crossing over to the consulting side – there are a lot of people who are not involved with CSWEA (WEF) who should be. We need to find ways to get those non-involved folks interested in our association.

I know the next year will go extremely fast. It seems like just a month ago I was elected as 2nd Vice President. Now I have moved into the office which so many talented and influential people have held over the years. I do feel quite humbled to be able to represent you and this organization for the coming year. I will try to make a difference and take your thoughts and suggestions seriously when it comes to improving our organization.

The 2011 Annual Conference will be in Brooklyn Park, MN – on the northwest corner of the twin cities. I urge you to start making plans to attend and also encourage you to invite some of your co-workers and neighboring facilities to send members to the conference. CS

"I would encourage all of you to think of ways that we can provide timely and meaningful information to our members. We need to find ways to get those non-involved folks interested in our association."

Click HERE to return to Table of Contents

ELEMENTS OF YOUR SUCCESS

Vision. Value. Passion. Integrity. Relationships. Attitude.

These elements make up the structure of AE2S. What does that mean to you? Extreme client service, trusted relationships, a shared vision for your future, and passion for every project. They all translate into your success.

Advanced Engineering and Environmental Services, Inc. (AE2S) Offices:
Minneapolis Moorhead
Bismarck Fargo Grand Forks Williston
Great Falls Kalispell
www.ae2s.com

WATER ENGINEERING
MUNICIPAL ENGINEERING
LAND DEVELOPMENT
SURVEY/MAPPING/GIS
FINANCIAL/ASSET MANAGEMENT
INSTRUMENTATION & CONTROL
ELECTRICAL ENGINEERING

AE2S®
Think Big. Go Beyond.

Passion

Eric R. Lecuyer

One of the most remarkable experiences I had at the 83rd Annual Meeting was the clear demonstration of passion by so many of those of us in attendance. The best demonstration was from our Farewell Breakfast Speaker, Richard Meeusen, CEO of Badger Meters and his passionate discussion of "Water: Wisconsin's Blue Goldmine". Clearly Richard Meeusen is a man with a great vision and a man on a mission. It was my great fortune again this year to have my family along as, more or less, slave labor in assisting (running) registration, handling the photography and in general making me look good. It was their fortune to see Mr. Meeusen's passionate presentation and my daughters were both moved by the experience. Long gone are the times when they knew dad did something with water and that meant they had a roof overhead and four squares. Their level of sophistication and understanding of our association's passion for water was elevated through this experience; they left the 83rd Annual Meeting very proud of what we all do and proud to be part of it in a small way.

Passion for our profession was clear from the second of the opening keynote address by Dr. Russell Cuhel, Senior Scientist for the Great Lakes Water Institute. Dr. Cuhel's work extends well beyond the study of the impact of mussel establishment on the water chemistry of our lakes – it extends to impassioning the many students, from middle school through grad students in the water field. His passion draws students like a magnet

> "So many of our folks have dedicated their professional lives, and spent full careers to ensuring that our water environment is ever improving and is sustained in all respects."

to this incredibly important research and he acknowledged the accomplishments of some past CSWEA students, including Megan O'Brien, a past SJWP contestant who made CSWEA proud with her runner up project: "The Light Factor: The relationship to bivalve shell composition and color". Clearly Megan was drawn to study this issue due to Dr. Cuhel's passion.

But passion for our life giving and sustaining water industry is not limited to superstars like Dr. Cuhel or Richard Meeusen; it is clearly imbedded in all of those committed to the profession. So many of our folks have dedicated their professional lives, and spent full careers to ensuring that our water environment is ever improving and is sustained in all respects. Passionate people have taken up the pen to provide comments to USEPA on issues from remarkably low phosphorus limits to Mississippi River TMDL's for total arsenic that are many times lower than the drinking water standards. Their perspective is clear, a passionate desire to protect public health and the environment without the potential to redirect billions of available funding from much more critical infrastructure renewal and sustainability needs. CSWEA's comments on these rule making issues can be found at www.CSWEA.org.

Take pride in the passion you have for your profession and take time to pass that passion along to the next generation(s). Too much has been taken for granted by the public at large with regard to our nation's waters and it is our passion that will help open eyes and lead the way. Passion is power! CS

Click HERE to return to Table of Contents

You asked for it. We delivered: EZ2™ Technology

Resilient Wedge Gate conforms to host pipe

- ✔ **1 Hour (or less) to Install (16" size installed in under 4 hours)**
- ✔ **EZ2™ *Valve Insertions* or *Line Stops* – (1 machine, 2 Functions)**
- ✔ **Meets AWWA material specs C-509-01 and C-509-09**

Plus...

- **Single excavation performance**
- **Standardized operation** - normal turns to actuate valve
- **Compact design**
- **Pipe-line integrity maintained**
- **Lightweight and compact installation equipment**
- **No service interruption** - process is completed under pressure
- **Sizes available for 4 inch through 16 inch systems and A/C pipe sizes**

Tuberculated Pipe? No problem!

EZ2™ Patented Resilient Wedge Gate is designed to work with both perfect and irregular I.D.s.

New Pipe, Old Pipe, Any Pipe!

***Simple, Easy* and *Economical* beats *Complicated, Difficult* and Expensive Every Time.**

Call for complete system details and to learn how you can start saving time and money.

Advanced Valve Technologies, Inc.

Headquarters
800 Busse Road
Elk Grove Village, IL 60007

Plant 2
12601 Homan Avenue
Blue Island, IL 60406

Call today for complete EZ2™ Valve information!
877.489.4909
www.avtfittings.com

83RD ANNUAL MEETING Award Winners

Laboratory Analyst Excellence Award
This award recognizes individuals for outstanding performance, professionalism and contributions to the water quality analysis profession. This award was established in 1993 and our winner this year is: Judy Theon City of Watertown, WI

William D. Hatfield Award
The William D. Hatfield Award is presented to operators of wastewater treatment plants for outstanding performance and professionalism. The award was established in honor of Dr. William D. Hatfield, Superintendent of the Decatur, IL, Sanitary District, who was President of the Central States Sewage Works Association in 1944-46 and served as President of the Federation of Sewage & Industrial Wastes Associations in 1958-59. From 1946 to 1954 this was a Central States award presented to recognize the best annual treatment plant operating report and now is awarded in recognition of outstanding professional service in both facility operations and public education. This year's winner is: Dan Lynch City of Janesville, Wisconsin

George W. Burke, Jr. Facility Safety Award
Recognizes an active and effective safety program in municipal and industrial wastewater facilities. This year's winner is the: Glenbard Wastewater Authority
Accepting is Gary Scott

Arthur Sidney Bedell Award
This award acknowledges extraordinary personal service to CSWEA over many years. This year's Bedell Award winner has served in many roles as a leader in CSWEA and within the Illinois Section, including serving as president in 2005-06. He has continued to serve the association beyond his presidency as Treasurer and WEF Delegate. He was instrumental in developing our Student Chapters in Illinois and remains an active mentor to the University of Illinois, Champaign-Urbana Student Chapter. Your Bedell winner is: Scott Trotter, Trotter and Associates, St. Charles IL

Awards were presented by Chris Browning, WEF Treasurer


Judy Theon


Dan Lynch


Gary Scott


Scott Trotter


Phil Parsons (Quarter Century Operator)


Rusty Schroedel


Sue Baert


Phil Parsons (Honorary Life Member)

Photos by Emily Lecuyer

Click HERE to return to Table of Contents

WEF Honorary Life Members

Honorary Life Membership is conveyed to people who maintain their WEF Membership continuously for 35 years.

Robert Hoffman
Glenn Wentink
Ralph Pfister
Phil Parsons (Phil was also inducted into the Quarter Century Operators Club this year)

WEF Service Awards

Presented to CSWEA members who have served as a Past Director to the Federation, as a Director at Large, or as a Committee Chair, or MA President.

Terry Krause WEF Delegate '06-09
Rusty Schroedel CSWEA President, '09-10

CSWEA Service Awards

Sue Baert IL Trustee, '08-10
Patti Craddock MN Trustee, '08-10
Rachel Lee YP Rep '08-10
Carol Strackbein Treasurer '08-10

Operations Award

The Operations Award is given in recognition of outstanding wastewater treatment plant operation (one operator per year for each of the member states of the Central States WEA).

Minnesota Section
Rick Ashling City of Albert Lea, MN

Wisconsin Section
Dave Lefebvre Green Bay Metropolitan Sewerage Dist, WI

Illinois Section
Gary Sowma North Shore Sanitary District, IL

Collection System Award

The Collection System Award is presented to an association member from each Section in recognition of outstanding contributions in advancing collection system knowledge and direct or indirect improvement in water quality.

WI Section
Tim Zimmerman Village of Germantown, WI

MN Section
Greg Guerrero City of Duluth, MN

Awards were presented by Rusty Schrodel, CSWEA President

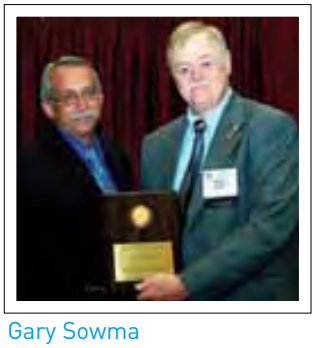

Patti Craddock


Carol Strackbein


Rachel Lee


Rich Ashling


Dave Lefebvre


Gary Sowma

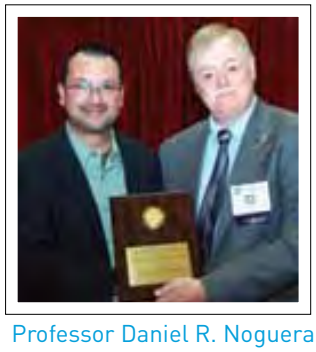

Tim Zimmerman


Greg Guerrero


Mark Eddington


Steven R. Reusser


Rich Hussey


Professor Daniel R. Noguera

Photos by Emily Lecuyer

Click HERE to return to Table of Contents

IL Section
Mark Eddington DeKalb Sanitary District, IL

Gus H. Radebaugh Award
Given to the author(s) of a deserving technical paper presented at an annual meeting of the Central States WEA. Established as the "Best Paper Award" in 1933, and changed to the "Gus Radebaugh Award" in 1941. This year we honor the paper selected at the 79th Annual Meeting.
Steven R. Reusser Madison Metropolitan Sewerage District
"Caution – Advanced Digestion Processes"

Industrial Environmental Achievement Award
This award is presented to an industry in recognition of outstanding contributions in waste minimization, pollution prevention, environmental compliance and environmental stewardship.
Frito Lay, Inc. Beloit, WI
Accepting is Aubrey Wells, Mike Stahl and Guy Kasbohm

Young Professional of the Year Award
Established in 2007, this award recognizes the contributions of young water environment professionals for significant contributions to CSWEA and to the wastewater collection and treatment industry. This year's winner is:
Rich Hussey, PE LAI, Ltd

Bill Boyle Educator of the Year Award
Established in 2007, this award recognizes accomplishments in the education and development of future water environment professionals by educators at all levels, from primary grades through graduate students. This award honors Professor William C, Boyle, a Professor Emeritus of Environment Engineering at the University of Wisconsin, Madison where he served as mentor to many CSWEA members. Beyond his role as educator, researcher and mentor, Bill Boyle has served the CSWEA throughout his career as a tireless promoter of ongoing education and training and a facilitator of many successful technical programs and events. We are pleased to present this year's Educator of the Year award to:
Professor Daniel R. Noguera, Ph.D
University of Wisconsin, Madison

Academic Excellence Award
This award is presented to an Annual Meeting Host State College or University student selected by their professor for having exhibited outstanding academic career. This year's winners have been judged to be outstanding students in the water environment field. In addition to this plaque, CSWEA awards a $250 cash scholarship award, one year paid Student Membership and complimentary registration to this Annual Meeting.
Forrest Bishop University of Wisconsin, Madison

Student Design Competition
The Design Competition is intended to promote "real world and hands on design experience" for students interested in pursuing an education or career in water or wastewater engineering. Teams select a design problem with judges choosing the best overall design concepts and presentation of a solution. This is our Fifth Annual Student Design competition.

University of Wisconsin, Madison
Beth Baumgartner, Flory Olson, Forrest Bishop & Charles Otis
Project: The North Plant
In 2009, CSWEA has established a second category for the Student Design Competition for humanitarian projects which focus more on bringing safe drinking water and sanitation to people around the world.

University of Illinois
Urbana-Champaign, Engineers With Out Borders:
Ian Bradley, Anthony Straub, Alyssa Sohn & Paul Folwarski
Project: Removal of Waterborne Viruses Using Iron-Amended Bio-sand Filters

Student Paper Winner
Megan Corrado University of Wisconsin, Madison
"Optimization of Phosphorus and Magnesium Release from Waste Activated Sludge"

Central States Water Scholarship Award
(Presented by Cheryl Parisien and Al Whalen)
New for 2010, our publisher of *Central States Water* magazine, Craig Kelman & Associates have provided a Scholarship Award in the amount of $500. The scholarship is to be awarded annually to a student at any level whose work as published in *Central States Water* is judged to be the best published student paper.
Jamie Molloy
Divine Savior Holy Angels High School, Milwaukee, WI
"The Effect of Nano Metal Oxides on Sentinel Organisms in the Aquatic Environment"


Paul Folwarski, Anthony Straub & Ian Bradley with Rusty Schrodel


Aubrey Wells, Mike Stahl, Dan Lynch & Guy Kasbohm.


Forrest Bishop & Rusty Schrodel


Al Whalen, Jamie Molloy & Cheryl Parisien

Photos by Emily Lecuyer

Click HERE to return to Table of Contents

Global Technologies, Local Solutions.

Degremont Technologies offers trusted, globally proven solutions for your water treatment challenges.

HEADWORKS
BIOLOGY
SEPARATION
MEMBRANE
DISINFECTION
BIOSOLIDS
SYSTEMS

suez environnement
Degrémont

www.degremont-technologies.com

SCHOLARSHIPS FUNDED

by your advertising participation

At the CSWEA 83rd Annual Meeting, my company, Craig Kelman & Associates, had the privilege of easing the financial burden of a young scholar by awarding the *Central States Water* scholarship to Jamie Molloy. She was chosen for this new scholarship for her paper *The Effect of Nano Metal Oxides on Sentinel Organisms in the Aquatic Environment*. She is a humble and deserving award recipient and we were proud to contribute to her education.

Craig Kelman & Associates is the publisher of *Central States Water*. We work closely with Executive Director Eric Lecuyer and the association in publishing a top-notch communication tool which provides networking opportunities to share new ideas, generate new business, and, most of all, to educate this industry in cutting edge technology and better ways to use the resources we have to recycle wastewater.

We established this scholarship not only because we feel very strongly about this industry but we also wanted a way to give back to the industry and the environment. We recognize that water is our most precious resource and that we need to take steps to protect it.

This scholarship is also the direct result of the advertisers who make this great publication possible. We sat down at the beginning of the year and came up with the idea to use a percentage of the advertising revenue to put towards this scholarship. So it is our valued advertisers who should be commended, not only for supporting the publication and making it possible, but also for allowing us to go that extra mile and create this scholarship. It is a credit to our advertisers who are so very passionate in this industry that, even through these tough economic times, we are able to provide such an award. To that extent we commend you.

If your company is interested in being part of this scholarship and at the same time advertising to the wastewater audience, please contact me directly for more information.

To reach water industry professionals in Minnesota, Illinois and Wisconsin through *Central States Water* magazine and its targeted readership, please contact me at

Craig Kelman & Associates

1-866-985-9782
awhalen@kelman.ca

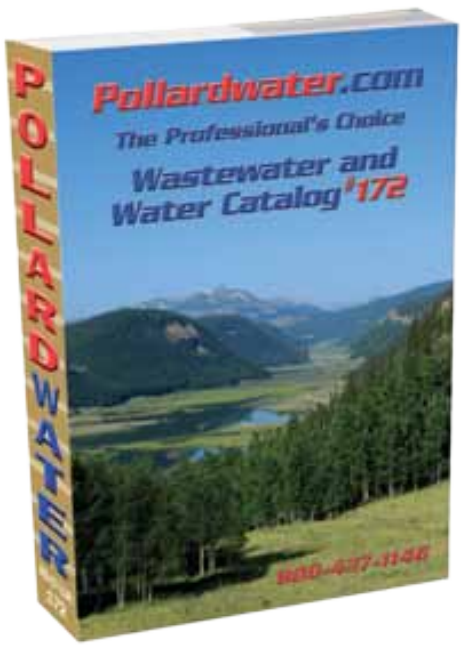
Al Whalen
Sales Manager

Click HERE to return to Table of Contents

Pollardwater.com

If you need it, we have it!

- AERATION
- CHART RECORDER
- CHEM FEED PUMPS
- DECHLORINATION
- FLOW TESTING
- GAUGES
- HOSE
- HYDRANT
- VALVE KEYS
- LABORATORY
- LEAK DETECTION
- LEVEL CONTROL
- LOCATORS
- MANHOLE
- METERS
- ODOR CONTROL
- PIPELINE
- PLUGS
- PROCESS
- PUMPS
- REFERENCE
- SAFETY
- SAMPLING
- STORMWATER
- VALVE
- WASTEWATER



Call for your 1408 page catalog.

Find it all at www.pollardwater.com

Phone 800-437-1146

Thanks to our CSWEA 83RD ANNUAL MEETING Sponsors & Exhibitors

SPONSORS

Platinum:
Brown and Caldwell

Gold:
AECOM
Drydon Equipment, Inc.

Silver:
Baxter & Woodman, Inc.
Black & Veatch Corporation
Donohue & Associates
Howard R. Green Company
Strand Associates, Inc.

Golf per hole:
Baxter & Woodman, Inc.
CDM
Crane Engineering
Cutler Hammer/Eaton Corporation
DeZurik
Donohue & Associates
Drydon Equipment
Fairbanks Morse
L.W. Allen
MSA Professional Services, Inc.
Peterson and Matz, Inc.
Strand Associates, Inc.
Symbiont
USEMCO, Inc.

Water For People:
Central States Water Magazine
LAI, Ltd.
North Coast Environmental, Inc.

Lanyards:
Brown and Caldwell
Donohue & Associates
Symbiont

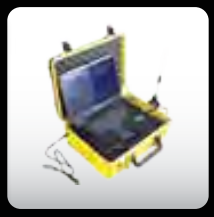
EXHIBITORS

Adaptor, Inc.
AIRVAC, Inc.
Applied Technologies, Inc.
Arteche PQ, Inc.
ASA Analytics
Baker Water Systems-Monitor
Baxter & Woodman, Inc.
Biorem
Boerger, LLC
Brown Bear Corporation
Cathodic Protection Management, Inc.
Centrisys Centrifuge
Crane Engineering
Cretex Specialty Products
Cummins NPower
Donohue & Associates
Doonan Environmental, LLC
Dorner Company
Drydon Equipment, Inc.
Eco Oxygen Technologies, LLC
Energenecs
Environmental Health Products & Service
Grundfos Pumps Corporation
FABCO Power Systems
Hach Company
HOBAS Pipe USA
ICS Healy Ruff
IntelliSys Information Systems
International Paint
ITT Water & Wastewater USA-Flygt
ITT/Sanitaire
JM Process Systems
Kruger, Inc.
L and S Electric, Inc.
LAI, Ltd.
Mulcahy/Shaw Water, Inc.
Multiform Harvest, Inc.
Municipal Economics & Planning
Natgun Corporation
North Coast Environmental, Inc.
Peterson and Matz, Inc.
PPG Protective and Marine Coatings
Praxair, Inc.
Process Equipment Repair Services, Inc.
Pure Technologies U.S.
Ruekert and Mielke, Inc.
Shand & Jurs,
an L&J Technologies Company
Short Elliott Hendrickson, Inc.
Siemens Water Technologies
Starnet Technologies, Inc.
Strand Associates, Inc.
Symbiont
TenCate Geotube
Thermal Process Systems
Trojan Technologies
Trotter and Associates, Inc.
Van Begen & Markson, Inc.
Visu-Sewer
Wonderware Midwest

Click HERE to return to Table of Contents

World Class Technology.
Delivered Locally.

3G Air*Linx* ™



3G Mobile™ AMR

Fixed*Linx*™ AMI

Interpreter™ Universal AMR Register System

Water•Gas•Electric

Accu*Linx*™ Hi-Resolution Register System

Octave™ Ultrasonic

5/8" - 2" PD & Multi-jet

Commercial Measurement

Hi-Resolution Data Logging

Revenue Impact Alerts

Master*Linx*™ Enterprise Management System

Visit www.MasterMeter.com Today.

Master Meter, Inc.
CONTACT: John Griffin
TEL: 817-842-8000
info@mastermeter.com

MASTER METER

Reading the Future™

CSWEA EXECUTIVE COMMITTEE
ADMINISTRATIVE YEAR 2010-2011

President
Jim Miller
Foth I&E LLC
Eagle Point II
612-961-2505
jim.miller@foth.com

1st Vice President
Beth Vogt
Greeley and Hansen
312-578-2321
bvogt@greeley-hansen.com

2nd Vice President
Randy Wirtz
Strand Associates, Inc.
608-251-4843
randy.wirtz@strand.com

Treasurer
Douglas Henrichsen
Brown and Caldwell
651-468-2077
dhenrichsen@brwncald.com

Immediate Past President
Ralph B. (Rusty) Schroedel
AECOM
920-912-1227
rusty.schroedel@aecom.com

WEF Director '12
Dave Raby
Howard R. Green Company
Court International Building
651-644-4389
draby@hrgreen.com

WEF Director '11
Scott Trotter
Trotter & Associates
630-587-0470
s.trotter@taiengr.com

PWO Representative '11
Charlie La Rocco
City of Elmhurst
630-688-2003
charles.larocco@comcast.net

YP Representative '10
Rich Hussey
LAI Ltd.
847-392-0990
rich@leyassociates.com

Illinois State Section Trustee '12
Gary Scott
Glenbard Wastewater Authority
630-790-1901 ext. 124
gscott@gbww.org

Minnesota State Section Trustee '12
John Glatzmaier
CH2M HILL
651-365-8526
john.glatzmaier@ch2m.com

Wisconsin State Section Trustee '11
Tom Sigmund
Green Bay MSD
920-438-1095
tsigmund@gbmsd.org

Executive Director
Eric R. Lecuyer
CSWEA
815-954-2714
cswea@ymail.com

CSWEA STANDING COMMITTEES
ADMINISTRATIVE YEAR 2010-2011

General Awards Committee
Beth Vogt, Co-Chair
Greeley and Hansen
312-578-2321
bvogt@greeley-hansen.com

Randy Wirtz
Strand Associates
608-251-4843
randy.wirtz@strand.com

Robert A. Zimmerman (Chair Hatfield)
218-299-5386

Chuck Hansen
Peterson & Matz
847-844-4405
pmatzil@aol.com

Tom Bunker
Earth Tech
262-634-1773
bunkert@sbcglobal.net

Steven Greenwood (Radebaugh Chair)
MCES
651-602-8763
steve.greenwood@metc.state.mn.us

Ken Johnson
Greeley and Hansen
312-578-2320
kjohnson@greeley-hansen.com

LaMont Albers
Process Equipment Repair Services Inc
262/629-5192
perslamont@aol.com

David C. Lane (Chair Bedell)
Rochester Water Reclamation
507-281-6190
dlane@rochestermn.gov

Academic Excellence Sub-Committee
Randy Wirtz (Chair)
Strand Associates
608-251-4843
randy.wirtz@strand.com

Bedell Sub-Committee
David C. Lane (Chair)
Rochester Water Reclamation
507-281-6190
dlane@rochestermn.gov

Ken Johnson
Greeley and Hansen
312-578-2320
kjohnson@greeley-hansen.com

Tom Bunker
Earth Tech
262-634-1773
bunkert@sbcglobal.net

Hatfield/Operations Sub-Committee
Robert A. Zimmerman (Chair)
218-299-5386

Dennis Streicher
City of Elmhurst
630-330-0881
Sreicher.elmhurst@prodigy.net

LaMont Albers
Process Equipment Repair Services Inc
262/629-5192
perslamont@aol.com

Radebaugh Sub-Committee
Steven Greenwood (Chair)
MCES
651-602-8763
steve.greenwood@metc.state.mn.us

Chuck Hansen
Peterson & Matz
847-844-4405
pmatzil@aol.com

Tom Bunker
Earth Tech
262-634-1773
bunkert@sbcglobal.net

Local Arrangements Committee
Chair 2011 MN
Sandy Mass
City of Duluth
218-730-4064
smass@ci.duluth.mn.us

Chair 2012 IL
Gary Scott
Glenbard Wastewater Authority
630-790-1901
gscott@gbww.org

Click HERE to return to Table of Contents

Nominating Committee
James P. Roth, P.E. (Chair)
MCES
651-602-1123
james.roth@metc.state.mn.us

Chuck Hansen
Peterson & Matz
847-844-4405
pmatzil@aol.com

Daniel L. Lynch
City of Janesville
608-755-3116
lynchd@ci.janesville.wi.us

Technical Program Committee
Scott Fronek (Chair)
Black & Veatch
952-545-6695 xt 15
froneksd@bv.com

Pavel Hajda
Baxter & Woodman, Inc.
815-459-1260
phajda@baxterwoodman.com

Steve Reusser
Madison Metro Sewerage Dist.
608-222-1201 ext. 263
stever@madsewer.org

Trevor Ghylin
CH2M Hill
414-847-0455
trevor.ghylin@ch2m.com

Jason Benson
AE2S
763-463-5036
Jason.Benson@AE2S.com

Rick Manner
Fox River WRD
847-742-2068
rmanner@frwrd.com

William C. Boyle
UW-Madison
608-238-4559
boyle@engr.wisc.edu

Public Education Committee
Patti Craddock (Chair)
Craddock Consulting Engineers
651-690-0400
pcraddock@craddockconsulting.com

Roger F. Gyger
M2T Technologies
630-983-7653
rgyger@m2ttech.com

Dan Busch
Green Bay MSD
920-438-1101
dbusch@gbmsd.org

Students Committee
Alison Sumption (Chair)
Howard R. Green Company
651-644-4389
asumption@hrgreen.com

Beth Vogt
Greeley and Hansen
312-578-2321
bvogt@greeley-hansen.com

Jim Beier
Crane Engineering Sales
920-257-0113
j.beier@craneengineering.com

Young Professionals Committee
Alison Sumption (Chair)
Howard R. Green Company
651-644-4389
asumption@hrgreen.com

Rich Hussey
LAI, Ltd.
847-392-0990
rich@leyassociates.com

Rachel M. Lee
Strand Associates, Inc.
608-251-4843
rachel.lee@strand.com

Joint Expo Committee
Tom Mulcahy (Chair)
Mulcahy/Shaw Water
262-241-1199
tmulcahy@mulcahyshaw.com

Eric R. Lecuyer
CSWEA
815-954-2714
cswea@ymail.com

Carol Strackbein
CSS Consulting
262-243-5412
cstrackbein@earthlink.net

Membership Committee
Ed McCall
CDM Inc.
312-346-5000
mccallej@cdm.com

Jay Kemp
AECOM Water
608-836-9800
Jay.Kemp@aecom.com

MARC Committee
Tom Mulcahy (Chair)
Mulcahy/Shaw Water
262-241-1199
tmulcahy@mulcahyshaw.com

Abraham Salmzadeh
Tech Sales
612-823-8238
salamzadeh@techsalesco.com

Andy Beeson
Gasvoda & Assoc.
708-891-4400
Abeeson@gasvoda.com

Tim Schilz
AquaSensors, LLC
262-255-4459
Tim.Schilz@AquaSensors.com

Education Seminar Committee Roster
Beth Vogt (Chair)
Greeley & Hansen
312-578-2321
bvogt@greeley-hansen.com

William Boyle
608-238-4559
boyle@engr.wisc.edu

Steve Bollweg
Wheaton Sanitary Dist.
630-668-1515
bollweg@wsd.dst.il.us

Dave Raby
Howard R. Green Company
651-644-4389
draby@hrgreen.com

Scott Fronek
Black & Veatch
952-545-6695 ext. 15
FronekSD@BV.com

Matt Allen
Madison Metro. Sewerage District
608-222-1201
MattA@madsewer.org

Lyle Zimmerman
Rochester WRP
507-281-6190
lzimmerman@ci.rochester.mn.us

Mike Mereness
MCES
651-602-8296
mike.mereness@metc.state.mn.us

Brian Davis
U.S. Filter/Envirex
414-521-8490
davisbn@USFilter.com

Eric R. Lecuyer
CSWEA
815-954-2714
cswea@ymail.com

Steve Arrant
Donohue & Associates, Inc.
920-208-0296
sarant@donohue-associates.com

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

Click HERE to return to Table of Contents

Jay Kemp
AECOM Water
608-836-9800
Jay.Kemp@aecom.com

Ed Seminar Technical Program Sub-Committee

Scott Fronek Chair
Stave Arant
William Boyle
Paige Novak
Dave Raby
Daniel Zitomer

MN Section Officers and Committee Chairs 2010-11

MN SECTION CHAIR Ted Field
TKDA
651-292-4574
Ted.Field@TKDA.com

VICE CHAIR John Friel
SEH
651-490-2140
jfriel@sehinc.com

SECRETARY/TREASURER Alison Sumption
Howard R. Green Company
651-644-4389
asumption@hrgreen.com

TRUSTEE to CSWEA John Glatzmaier
CH2M HILL
651-365-8526
john.glatzmaier.com

IMMEDIATE PAST CHAIR Jason Benson
AE2S
763-463-5036
Jason.Benson@AE2S.com

GOVERNMENT AFFAIRS COMMITTEE CHAIR Greg Johnson
Bolton & Menk
651-704-9970

COLLECTION SYSTEM COMMITTEE CHAIR Timothy Keegan
Brown and Caldwell
651-298-0710
tkeegan@brwncald.com

INDUSTRIAL WASTES COMMITTEE CHAIR Clay Watson
Gold'n Plump Poultry
320-240-6616
cwatson@goldnplump.com

MEMBERSHIP COMMITTEE CHAIR Tracy L. Ekola, PE
Short Elliott Hendrickson, Inc.
320-229-4406
tekola@sehinc.com

SAFETY COMMITTEE CHAIR Sean Hancock
City of Superior
715-394-0392
hancocks@ci.superior.wi.us

OPERATIONS COMMITTEE CHAIR Les Lange
City of Willmar Wastewater Treatment
320-235-4762
llang@ci.willmar.mn.us

PUBLIC EDUCATION COMMITTEE CHAIR Patti Craddock
Craddock Consulting Engineers
651-690-0400
pcraddock@craddockconsulting.com

LABORATORY COMMITTEE CHAIR Patti Mettler
City of Mankato
507-387-8667
pmettler@city.mankato.mn.us

BIOSOLIDS COMMITTEE John Graupman, P.E.
Bolton & Menk, Inc.
507-625-4171
johng@bolton-menk.com

MWOA TRUSTEE Brian J Mehr
City of Hutchinson, Wastewater Dept.
320-234-4233
bmehr@ci.hutchinson.mn.us

IL Section Officers and Committee Chairs

IL SECTION CHAIR Eddie McCall
CDM
312-346-5000
mccallej@cdm.com

VICE CHAIR Dean Wiebenga
Peterson & Matz
847-844-4405
Deanpmi@aol.com

2nd VICE CHAIR Jim Huchel
City of Crystal Lake
815-356-3700 ext. 4168
jhuchel@crystallake.org

SECRETARY/TREASURER Shelly Cumbow
Danville Sanitary District
217-442-3193
shellyc@cooketech.net

TRUSTEE to CSWEA Gary B. Scott
Glenbard Wastewater Authority
630-790-1901 ext. 124
gscott@gbww.org

IMMEDIATE PAST CHAIR Gary B. Scott
Glenbard Wastewater Authority
630-790-1901 ext. 124
gscott@gbww.org

GOVERNMENT AFFAIRS CHAIR Robert Johnson
630-574-2006
bob.johnson@earthtech.com

COLLECTION SYSTEM CHAIR Mark Eddington
DeKalb Sanitary District
815-758-3513
MEddington@dekalbsanitarydistrict.com

MEMBERSHIP CHAIR Eddie McCall
CDM
312-346-5000
mccallej@cdm.com

SAFETY CHAIR Gary B. Scott, CPMM
Glenbard Wastewater Authority
630-790-1901 ext. 124
gscott@gbww.org

OPERATIONS CHAIR John Szwedo
Baxter & Woodman, Inc
847-223-5088
jszwedo@baxwood.com

OPERATIONS VICE-CHAIR Steve Bollweg
Wheaton Sanitary District
630-668-1515
bollweg@wsd.dst.il.us

PUBLIC EDUCATION CHAIR Roger Gyger
M2T Technologies
630-983-7653
rgyger@m2ttech.com

LABORATORY CHAIR Mary Dressel
Downers Grove Sanitary District
630-969-0664
mdressel@dgsd.org

YOUNG PROFESSIONALS CHAIR Rich Hussey
LAI, Ltd.
847-392-0990
rich@leyassociates.com

YP VICE-CHAIR Dan Small
Strand Associates
815-744-4200

STUDENT CHAIR Scott Trotter
Trotter & Associates
630-587-0470
s.trotter@taiengr.com

WI Section Officers and Committee Chairs

WI SECTION CHAIR Keith Haas
City of Racine
262-636-9434
keith.haas@cityofracine.org

VICE-CHAIR Jane Carlson
Strand Associates
608-251-4841
jane.carlson@strand.com

SECRETARY/TREASURER Dave Arnott
Ruekert-Mielke
262-542-5733
darnott@ruekert-mielke.com

Click HERE to return to Table of Contents

CSWEA TRUSTEE Tom Sigmund
Green Bay Metropolitan Sewerage District
920-432-4893
tsigmund@gbmsd.org

IMMEDIATE PAST CHAIR Jim Beier
Crane Engineering Sales, Inc
920-257-0113
j.beier@craneengineering.com

GOVERNMENT AFFAIRS COMMITTEE CHAIR Brandon Koltz
Symbiont
414-291-8840
brandon.koltz@symbiontonline.com

COLLECTION SYSTEM COMMITTEE CHAIR Andrew Craven
608-251-4843
andrew.craven@strand.com

MEMBERSHIP COMMITTEE CHAIR Jay Kemp
AECOM Water
608-836-9800
jay.kemp@aecom.com

SAFETY COMMITTEE CHAIR Jerry Hirt
Alpha Terra Science.
920-892-2444
jerryhirt@alphaterra.net

OPERATIONS COMMITTEE CHAIR Troy Larson
Strand Associates
608-251-4843
Troy.Larson@strand.com

PUBLIC EDUCATION & AWARENESS COMMITTEE CHAIR Dale Doerr
City of Sheyboygan
920-459-3464
dale.doerr@sheboyganwwttp.com

STUDENT/YOUNG PROFESSIONALS COMMITTEE CHAIR Trevor Ghylin
CH2MHill
414-847-0455
trevor.ghylin@ch2m.com

WATERSHED MANAGEMENT CHAIR Julie McMullin
Brown and Caldwell
414-203-2904
jmcmullin@brwncald.com

INDUSTRIAL WASTES COMMITTEE CHAIR Bill Oldenburg
Green Bay Metropolitan Sewerage District
920-438-1079
boldenbrurg@gbmsd.org

SPRING BIOSOLIDS SYMPOSIUM REPRESENTATIVE Jay Kemp
AECOM Water
608-836-9800
jay.kemp@aecom.com

WWOA LIAISON Dennis Egge
City of Janesville
608-755-3121
egged@ci.janesville.wi.us

WWEA CHAIR Tom Mulcahy
Mulcahy/Shaw Water
262-241-1199
tmulcahy@mulcahyshaw.com

Click HERE to return to Table of Contents

83RD ANNUAL MEETING

Click HERE to return to Table of Contents

Photos by Emily Lecuyer

Click HERE to return to Table of Contents

15th Annual CSWEA Education Seminar:
Managing Biosolids in Our Energy Conscious Era

Our 15th Annual CSWEA Education Seminar was held on April 6, 2010 at the beautiful Monona Terrace in Madison, Wisconsin. With record attendance, outstanding world-renowned speakers, and an enthusiastic crowd, the 15th Education Seminar was among the best ever. Be sure to watch www.CSWEA.org as well as *Central States Water* and mark your calendars for the 16th Education Seminar in April 2011.

Increasing demands for advanced treatment, rising energy costs, emphasis on sustainability, renewable energy, and carbon footprint, and public concerns about biosolids reuse are putting the "squeeze" on biosolids processing and disposal at the dawn of the 21st century.

Click HERE to return to Table of Contents

This requires critical evaluation and sophisticated operations for biosolids management programs. Those who attended the 15th Annual CSWEA Education Seminar at the Monona Terrace Convention Center in Madison, WI heard both internationally recognized and regional experts who provided an exceptional program, with passion. Suffice to say, no one left early! CS

Dr. Art Unble

Dr. Jenkins

Tom Sigmund

Dr. Sally Brown

Attendees at the reception

Click HERE to return to Table of Contents

IMPROVING THE INDUSTRY STANDARD!

RESILIENT SEATED GATE VALVES

Sizes 2" - 72"

- All Ductile - C509 Thick Wall (Not Thin Reduced Wall)
- Extra Strong SS Stem, Standard
- ANSI/NSF 61 Certified
- Extra Thick Epoxy Coated 12+Mils
- EPDM Rubber Seat and Seals
- Flange Classes: 125 or 250
- Flange, MJ, Push-On
- NRS & OS&Y

METAL SEATED GATE VALVES

Sizes 2" - 48"

- IBBM AWWA C500 - Solid Wedge
- Flange Classes: 125 or 250
- NRS & OS&Y
- Rollers, Tracks & Scrapers, Standard

DUCKBILL CHECK VALVES

Sizes 2" - 96"

J&S HedFlex Duckbill Check Valve Flange & Slip-on

J&S HedFlex Duckbill Inline Check Valve Flange & Slip-In

LUG & WAFER BUTTERFLY VALVES

Sizes 2" - 24"

Lug Butterfly Valve
Shown w/Gear & Handwheel

Wafer Butterfly Valve
Shown w/Gear & Handwheel

Ph: 281-324-3990
sales@JandSValve.com
JandSValve.com

J & S Valve

CSWEA/IWEA to host 15th Annual WEFTEC Welcome Reception at WEFTEC '10

CSWEA and **IWEA** members are invited to join us for this year's WEFTEC '10 CSWEA/IWEA Reception, Sunday, October 3, 2010. The reception will be held from 6:00 to 8:00 p.m. at the Hilton New Orleans Riverside. Our joint WEFTEC Welcome Reception has become a not-to-miss event for members and friends attending WEFTEC and offers an outstanding kick-off each year. The reception will be held in the Salon C Room of the WEFTEC '10 Headquarters hotel in New Orleans. All members and supporters of CSWEA and IWEA are invited to attend.

Click HERE to return to Table of Contents

DIGESTER FOAMING COMMITTEE ACTIVITIES

By Jeff Brochtrup, Chair, Ad Hoc Committee on Anaerobic Digester Foaming

The ad hoc committee on anaerobic digester foaming has completed its work the year.

ACTIVITIES

Our primary accomplishments were to implement a survey of WWTPs in the states of Illinois, Minnesota, and Wisconsin; host a discussion session with Dr. David Jenkins on digester foaming on April 7, the day after the Education Seminar; and plan and hold a workshop on digester foaming on April 21.

All three activities were successful. The survey was responded to by 94 of 216 WWTPs identified as having anaerobic digesters, a response rate of 44%. The results showed that 53% of the survey respondents and a minimum of 23% of all plants with anaerobic digesters in the three states had problems with digester foaming. The April 7 discussion was attended by 25 persons, the April 21 workshop was attended by 47 persons and the great majority of attendees at both events indicated that the events were worth their time to attend.

The brief presentations by Randy Wirtz, Krishna Pagilla, Sharon C. Long and Amanda Siebels are posted at www.CSWEA.org.

THANKS

I would like to acknowledge and thank a number of individuals and organizations for their efforts on behalf of the committee:

- Randy Wirtz for handling local arrangements for the April 7 and April 21 events
- Strand Associates for allowing use of their office facilities for the April 7 and April 21 events at no cost to the association.
- Rusty Schroedel and AECOM for contributing use of the AECOM teleconferencing capabilities at no cost to the association.
- All the committee members:

Al Parrella, Western Lake Superior Sanitary District, MN

Bob Stark, City of Red Wing, MN

Jim Huchel, City of Crystal Lake, IL

Scott Trotter, Trotter & Associates, IL

Steve Reusser, Madison Metropolitan Sewerage District, WI

Randy Wirtz, Strand Associates, Inc.

Daniel H. Zitomer, Marquette University, WI

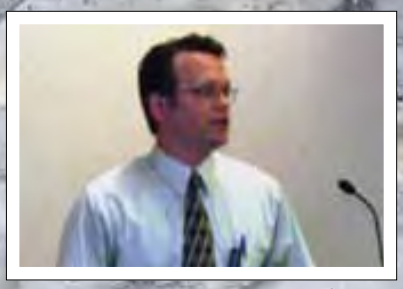
Eric Lecuyer, City of Crystal Lake, IL, and CSWEA Executive Secretary

Rusty Schroedel, AECOM Water, and CSWEA President

Click HERE to return to Table of Contents

Krishna Pigilla

Sharon Long



Randy Wirtz

Click HERE to return to Table of Contents

Superior Solids-Handling WASTEWATER EQUIPMENT.

GORMAN-RUPP PUMPS

Gorman-Rupp ReliaSource™
8x12 Above Ground Pump Station

PATTERSON PUMP COMPANY
SUBSIDIARY OF THE GORMAN-RUPP COMPANY

Patterson MPVT® Pumps

Gorman-Rupp and Patterson sewage pumps are utilized in wastewater collection systems for community expansions, as well as retrofitting existing pump systems. Gorman-Rupp self-priming centrifugal and Patterson Multi-Purpose Vertical Turbine® pumps also have the ability to pass up to 3" solids making them the perfect solution for all debris laden applications. And, because we apply the same high standards to our distributors that we do to our pumps, you can trust that you are going to get the best pump, the best pumping system and the best service possible from Crane Engineering. Contact Crane Engineering today for more information on Gorman-Rupp and Patterson pumping systems.

DISTRIBUTED BY:

CRANE ENGINEERING

Optimizing Fluid System Performance

Call **(920) 733-4425** or go to **craneengineering.net/CSWEA**

GOLF OUTING

The second annual Northwoods Collection System Seminar pre-conference golf outing will be held on Wednesday, July 28 in Marshfield, Wisconsin.

Location: Holms Riveredge Golf Course
10191 Mill Creek Drive
Marshfield, WI 54449

Cost: $55.00 per person includes:
- 18 holes of golf with cart
- Dinner (rib eye with potato)

Time: 12:30 shotgun start
4 player scramble

Date: Wednesday, July 28

Golf – Dinner – Door Prizes

NAME	OPERATOR or OTHER	E-MAIL

Sponsor fee:
$25.00 required per firm attending, includes any non-municipal attendee.
Donated prizes are welcome in addition to the fee.

Qty _____ x $55.00 = $_____
Sponsorship fee $25.00
Total amount enclosed $_____

Make checks payable to: Tom Mulcahy
10144 N Port Washington Rd
Mequon, WI 53092

QUESTIONS? info@mulcahyshaw.com

Click HERE to return to Table of Contents

Green Bay MSD

Dave LeFebvre and the operating staff of the Green Bay MSD received CSWEA's Operations Award for Wisconsin at the 83rd Annual Meeting.

The Green Bay Metropolitan Sewerage District (GBMSD) owns and operates two wastewater treatment facilities in Green Bay and De Pere, WI. Combined, the facilities on average treat 39 million gallons per day (mgd), 30 mgd at the Green Bay facility and nine mgd at the De Pere facility. GBMSD provides service to over 219,000 people over a 285 square mile area. The service area includes the cities of Green Bay and De Pere; the villages of Allouez, Ashwaubenon, Bellevue, Hobart, Howard, Luxemburg, Pulaski, and Suamico; the towns of Green Bay, Humboldt, Lawrence, Ledgeview, Pittsfield, Red River, and Scott; and contract customer Procter & Gamble Paper Products Company.

Click HERE to return to Table of Contents

Both facilities are modern, well-maintained sewage treatment plants. The Green Bay facility is designed for 49 mgd and operates two multiple hearth incinerators. The De Pere facility is designed for 14.2 mgd and solids are sent to the Green Bay facility for processing. GBMSD has 85 miles of interceptor pipes. GBMSD has net assets of $158 million and an annual operating budget of $26 million. GBMSD currently employs 87 full-time employees.

Green Bay and De Pere facility profiles

Pump Station – both facilities

Municipal wastewater arrives at the Green Bay facility's pump station through a 108" interceptor. The objects in the wastewater are removed with 2 1/8" size bar screens. From this first screening point, one of four large pumps lifts the wastewater to the next step in the treatment process. Separately, wastewater flows in from Proctor & Gamble through a 42" inceptor. The mill wastewater is pumped to the next step in the treatment process and is combined with the municipal wastewater.

As the wastewater enters the De Pere facility, it passes through 1/4" fine screening devices. The material collected is washed, compacted, and sent to a landfill for disposal. Large centrifugal pumps convey the wastewater to the Preliminary Treatment Units for further processing.

Preliminary treatment units (PTU) – De Pere

As wastewater flows through the PTUs, the flow speed is slowed to one foot per second, allowing sand and other coarse material to settle to the bottom. The settled material is removed, washed, and disposed of in a landfill. The oil and grease that rises to the surface is skimmed off the top of the tank for further processing.

Headworks – Green Bay

Headworks are often considered the beginning of the treatment process at the Green Bay facility. Within, step screens provide preliminary treatment, and degritting equipment separates and removes inorganic material from the waste streams. Incoming wastewater passes through four fine step screens,

Click HERE to return to Table of Contents

which trap the debris. Once trapped, the solid objects are removed, washed, compacted, and sent to a landfill.

Primary clarifiers – Green Bay

From Headworks, the wastewater flows into the primary clarifiers. The Green Bay facility has four primary clarifiers that hold about one million gallons each. In the primary clarifier, the wastewater is slowed which allows the solids in the water to settle out. The floating material is collected by an arm skimmer and sent on for further processing. Nearly 60% of the solids are removed in this process before the wastewater moves on to the aeration basins.

Aeration basins – both facilities

Wastewater flows to the aeration basins where air is supplied by a compressor through fine bubble diffusers that lay at the bottom of each basin. The aeration systems utilize the activated sludge process, which is single stage nitrification/denitrification with biological phosphorus removal. For successful treatment, the operators must insure there are sufficient numbers of microorganisms present to completely breakdown the influent waste, ammonia, and phosphorus.

Final clarifiers – both facilities

After the wastewater leaves the aeration basins, it enters the final clarifiers where any solid material is again settled out to the bottom of the basins. The solids either are sent back to the aeration basins as return activated sludge or are wasted to the gravity belt thickeners. The water that flows over the weirs is sent to the disinfection process.

Disinfection – both facilities

As the wastewater prepares to leave the Green Bay facility, sodium hypochlorite is injected into the water through a mixer at the very beginning of the disinfection chamber. The mixer is used to help distribute the chemical evenly in the water. Next, the water flows through a series channels to make sure that there has been sufficient time and contact to kill bacteria. At the end of the last pass, sodium bisulfite is added to remove any residual chlorine.

The effluent chlorine residual is monitored and controlled through a computer control system. This system measures the residual chlorine just prior to the injection of sodium bisulfite and controls the amount of sodium bisulfite used. The operators conduct tests to verify that the residual chlorine has been removed from the effluent.

As the wastewater prepares to leave the De Pere facility, it goes through a disinfection process to kill remaining bacteria. The De Pere facility uses an ultraviolet light disinfection system that is capable of treating 15 mgd. The liquid chlorine treatment process is still retained and used during periods of high flow.

Solids processing

Connected by a pipeline, the De Pere facility sends its solids to the Green Bay facility for processing.

Gravity thickening

There are four gravity thickener basins. The basins receive sludge and scum flow from the four primary clarifiers along with the scum from the ten final clarifiers.

The gravity thickeners provide a quiescent condition to thicken the sludge prior to pumping to the sludge holding tanks (SHT) in the solids processing building. The quiescent condition in the gravity thickeners also allows the scum and grease to float to the surface of the basin.

A rotating collector mechanism scrapes the bottom sludge toward a center sump for removal and skims the floating material into a scum manhole. Scum pumps transfer the scum from the manholes to the scum concentrator in the solids building. This scum is then further thickened and pumped to the incinerator as a fuel source.

Gravity belt thickeners

The gravity belt thickeners (GBT) thicken the waste activated sludge from the final clarifiers. To aid in de-watering the sludge, polymer is added to the sludge at the front of the GBT. Flocculation occurs

Click HERE to return to Table of Contents

when the solids start to separate from the liquid. The filtrate drains to a pan below the belt and is pumped back to the beginning of the treatment process. The sludge on the belt is turned continuously by chicanes. The chicanes move the sludge back and forth allowing the water to fall through the belt to the drain. Near the end of the belt, a ramp contacts the belt at its leading edge causing the sludge to roll back on itself. The ramp is adjustable to enhance further the thickening of the sludge. The thickened sludge is sent to the sludge holding tanks to mix with the primary sludge and next to the belt filter presses.

Belt filter presses

Thickened primary and waste activated sludges are dewatered and thickened prior to incineration. The sludges are combined in sludge holding tanks and mixed to keep them well blended. The blended sludges are conditioned with polymer before being fed onto the belt filter presses (BFP).

The sludge moves along the BFPs on a porous cloth belt, which allows the water to drain. The solids on top of the belt, quickly concentrate as the water drains away. The belts move through a series of rollers applying more than 500 pounds of pressure, to squeeze out as much water as possible. The solids coming off the BFPs are conveyed to the incinerators.

Incineration

The dewatered BFP sludge is burned to an ash within two multiple hearth incinerators. Burning the sludge reduces the weight and volume, resulting in less expensive landfill tipping and hauling fees. Incineration at the Green Bay facility takes place on a continuous basis. Operators control and monitor the incineration process 24/7 from the solids control room. CS

Click HERE to return to Table of Contents

CAUTION:
Advanced Digestion Processes

By Steven R. Reusser, Madison Metropolitan Sewerage District

Editor's note: Steven Reusser received the Radebaugh Award at the 83rd Annual Meeting for his paper, which is summarized here. The full paper can be found at www.CSWEA.org.

INTRODUCTION

In 2000 the Madison Metropolitan Sewerage District completed a facility plan for expansion of the district's anaerobic digestion facilities at the Nine Springs Wastewater Treatment Plant. Loadings had exceeded mesophilic digestion capacity and frequent winter foaming problems were causing serious operational difficulties. As a result of facility planning, associated bench scale digestion studies at the district, and subsequent bench scale studies by Santha, et al, at Iowa State University during pre-design, the selected plan for expansion was to operate a "batch" TPAD digestion system. The process was described in a publication by Fronek et al. The operation would consist of batch, fill and draw cycles at 12-hour intervals from three existing reactors operated at the thermophilic temperature of 135 degrees F, then recover heat in the process of reducing the temperature in transfer to a new, single mesophilic reactor. The sludge would then be transferred to three smaller existing mesophilic digesters. The goal of the digestion system design was to produce a Class A sludge within the digestion system itself. Thus any portion of the sludge could be dewatered and used to create a dry product for recycle. The district has operated a successful liquid land application program for over 30 years. The need for additional winter storage, and narrowing windows of time for land applying the liquid product were making the production of a dry Class A product within the digestion system a cost justifiable alternative.

TABLE 1

DIGESTION DESIGN INFORMATION		
	2002	2020
Sludge Flow (gpd)	233,000	389,000
Solids Feed (lbs/day)	91,000	153,000
Thermophilic SRT (days)	13.0	7.4
Mesophilic SRT (days)	13.2	7.9
Solids Loading Rate (Lbs VSS/cf)	.08	.135
Minimum VS Destroyed (%)	55	55
Maximum VS Destroyed (%)	63	63

The Nine Springs Wastewater Treatment Plant is a biological nutrient removal plant, which uses a variation of the UCT process. A schematic of the secondary biological treatment system is shown in Figure 1. The typical operating SRT for the secondary system is approximately 9.0 days. The average effluent total phosphorus concentration from the system over the last 10-year period has been 0.35 mg/l, and ammonia nitrogen has been 0.08 mg/l.

The waste activated sludge is thickened in DAF flotation thickeners to approximately 4.2% solids, and pimary sludge is thickened in gravity thickeners to 4.5% solids. The thickened sludges are combined and fed to the anaerobic digesters. Current 2009 waste sludge production averages approximately 49,000 lbs/day, and primary sludge production approximately 61,000 lbs/day.

Design of upgrades for the anaerobic digestion facilities was completed in 2003. A schematic of the digestion system as designed is shown in Figure 2. Start-up of the advanced digestion system was begun in February, 2006. Design data for the system is given in Table 1.

The selected operational strategy included pre-heating the sludge to 135 degrees by pumping through two tube and shell heat exchangers in series. The tube and shell heat exchangers became the first operational problem as, even though the level of grease in the district's raw wastewater is not considered atypical, the heat exchanger tubes would rapidly coat with grease and the heat exchanger capacity would drop 40% or more within several hours

Click HERE to return to Table of Contents

and prohibit pre-heating to required thermophilic temperatures. Because of this the digestion system was never started-up as designed. A process alternative incorporating acid phase digestion was implemented as part of the advanced digestion system in order to mitigate the grease problem. The grease problem, though, was only one of several unanticipated problems encountered with advanced digestion system operation. These problems included:

Grease in the primary sludge and primary skimmings quickly coated the heat exchanger tubes as described above.

The new 6 mm fine screens at the plant headworks were not removing rags to a high enough degree to prevent plugging in these same raw sludge heat exchangers.

Headlosses in the raw sludge heat exchanger were much higher than vendor predictions.

When the digesters were batched for an extended time, gas would accumulate in the pipes. The gas would bind the centrifugal pumps upon withdrawal causing the operators to spend much time bleeding gas from the pump volutes.

Struvite (magnesium ammonium phosphate) precipitation occurred at a greatly accelerated rate in the recovery exchanger, pumps and piping downstream from the thermophilic digesters. The district's biological nutrient facility provides an excess of phosphorus for struvite precipitation. The struvite accumulation, which has always been a problem in the district's anaerobic digestion system, became a much more pronounced problem.

Click HERE to return to Table of Contents

Vivianite (ferrous phosphate) formation in the second stage heat exchanger reduced heat exchange capacity due to iron added to the plant recycle streams. This iron dosage had been part of the district's strategy for the last 10 years to reduce phosphorus recycle to the biological phosphorus treatment system, and to help prevent struvite problems in the anaerobic digestion system.

Foaming problems continued to plague the digestion system.

Operation at higher digestion temperatures resulted in much higher moisture content in the digester gas, and higher resultant H2S and siloxane levels. This resulted in a major failure of one of the district's generator engines.

Significant odors resulted from conversion of digester 7 to an acid digester.

The new "step down" mesophilic digester shown in Figure 2 was converted to an acid digester to hydrolyse grease and allow heating of the sludge in two stages to alleviate heat exchanger problems and to assure foaming would not occur in the thermophilic digesters. The system thus became a three stage, acid-thermo-meso system. See the revised process schematic in Figure 3.

From Sept. 2006 through July 2008, the district operated the modified three stage system. Strategies were developed and changes implemented to deal with problems encountered. This paper will describe those strategies and the results of those efforts. Eventually, though, mixing problems in the retrofitted acid digester interfered with operation to the degree the system was returned to single stage mesophilic operation.

The following are the periods of operation which will be discussed:

September, 1, 2006 to mid-November, 2006 – Start-up of the acid digester and two of the three thermophilic digesters; acid digester problems in mid-November

December 1, 2006 to April 1, 2007 – Interim operational mode with acid digester out of service for mixer repair; all three thermophilic digesters were in service

April 1, 2007 to about September, 2007 – Continuous period of acid/thermo/meso operation; acid digester problems beginning mid-July

September, 2007 to February 2008 – Interim operational mode with acid digester totally out of service from December 1 until February 1, 2008

February, 2008 to July, 2008 – Acid/thermo/meso process in operation until abandoned because of acid digester failure. Single stage mesophilic digestion re-implemented starting in July

Process performance of the three stage system was as good or better than anticipated from a bacteriological standpoint with indicator fecal coliform levels generally less than 20 mpn/100 ml on a weight wet basis, and volatile solids reduction exceeding 60%. This is even with total detention times less than 12 days total and two-hour batch times. It was found the three stage system could perform quite well from a process standpoint, but many materials handling factors must be carefully considered in the design of such a system.

DISCUSSION AND SUMMARY

The advanced digestion process implemented in Madison went through several iterations of problems and solutions. Grease coating the tubes of raw sludge heat exchangers was initially the problem to overcome, and an acid phase digester was employed to mitigate the problem. A muffin monster was installed ahead of the heat exchangers because new 6 mm opening band screens at the headworks were not adequately removing raggy material plugging the heat exchangers. Gas binding of centrifugal pumps made batching the thermophilic digesters difficult because of gas production in the suction pipes when sludge was not being withdrawn. The centrifugal pumps were replaced with progressive cavity. Struvite and vivianite scaling in heat exchangers, pumps, and pipes became an extreme problem and was related to the biological phosphorous removal process employed at the plant. This problem was much more severe than with single stage mesophlic digestion previously employed at the plant. The district was unable to resolve this problem with current ferric chloride dosing locations, but if acid digestion problems had not forced shutdown of the process, piping changes would have been made to add ferric chloride directly to the thermophilic digesters. The impacts that this change would have made are not known. Moisture, siloxanes, and hydrogen sulfide contaminants in the gas caused problems with digester gas utilization in the district's two generator engines and blower engine. A proprietary gas treatment system was fast-tracked and started up to alleviate these problems.

Click HERE to return to Table of Contents

The process was ultimately discontinued because the district was unable to keep a retrofitted digester operating as an acid digester. As performance continued to be problematic it was decided to pursue a facility plan to decide on future upgrades to the digestion system and to provide capacity to the year 2030. Alternatives for digestion and producing a Class A product are again being considered. Planning is being carried out with consideration of the problems encountered while implementing the three stage advanced digestion system. CS

FIGURE 1

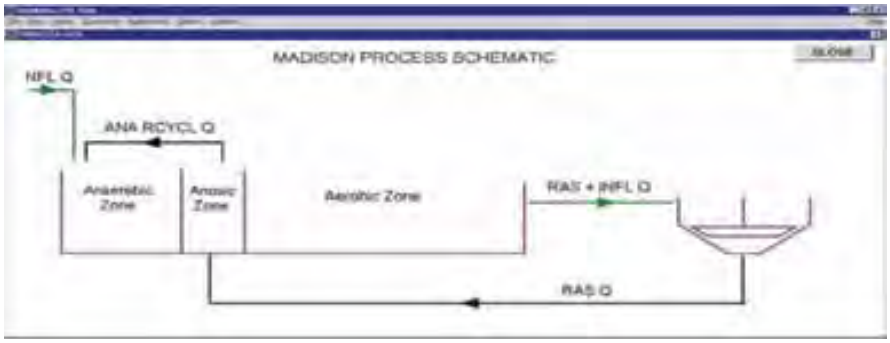


FIGURE 2

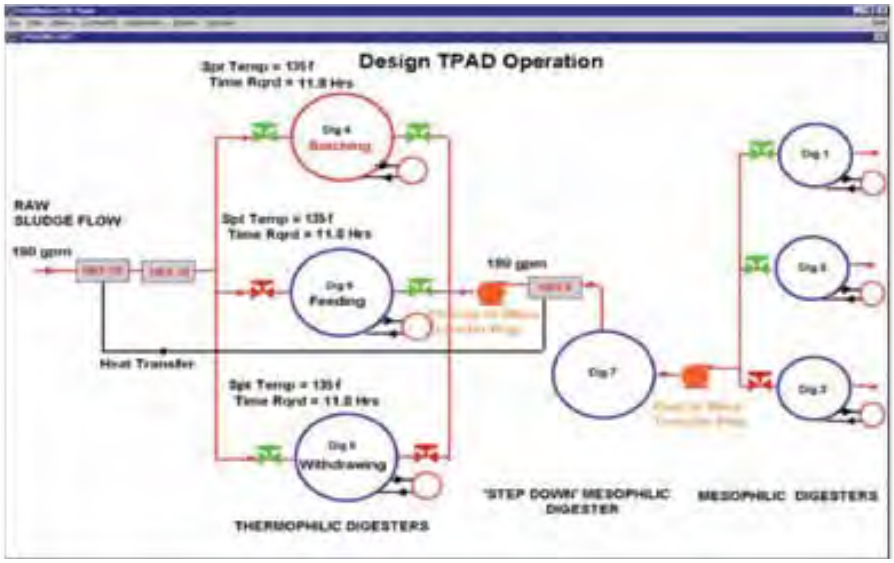
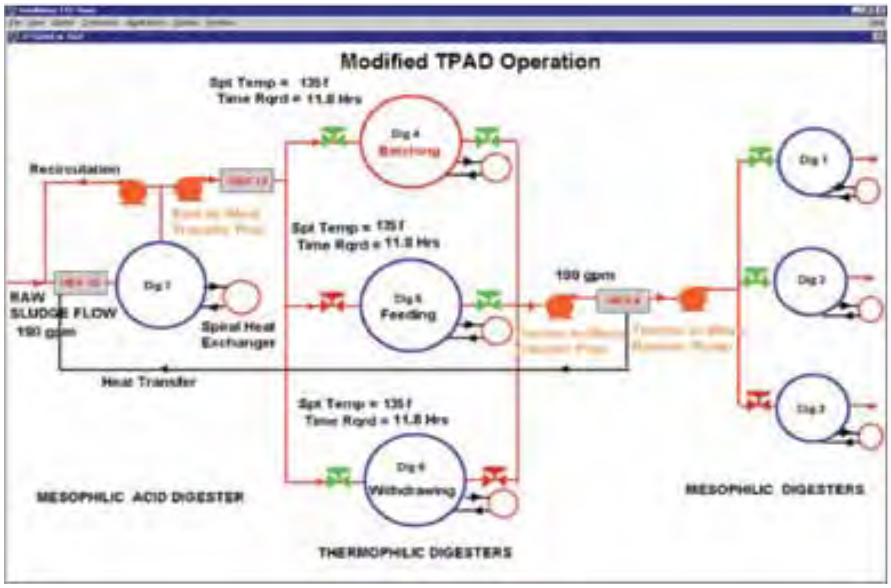


FIGURE 3



Click HERE to return to Table of Contents

Click HERE to return to Table of Contents

Student Paper Competition

Editor's note: Megan Corrado will represent CSWEA in WEF's Student Paper Competition at WEFTEC '10 in New Orleans. Below is an introduction to her paper. The full paper can be viewed at www.CSWEA.org.

OPTIMIZATION OF PHOSPHORUS AND MAGNESIUM RELEASE FROM WASTE ACTIVATED SLUDGE

Megan M. Corrado
Department of Civil and Environmental Engineering, University of Wisconsin – Madison

ABSTRACT

Several options were studied in an effort to maximize phosphorus concentrations as the first step in a phosphorus removal process upstream of anaerobic digestion. Experiments were conducted according to the procedures described in Chaparro and Noguera (2003) using various combinations of wastewater streams, pH modification, and enhanced fermentation. In addition to evaluating phosphorus release, magnesium release from WAS has been quantified. When combining waste activated sludge (WAS) and primary sludge, a mixture of 43% WAS and 57% primary sludge, by mass, was chosen as optimal. Out of all of the combinations, the 100% WAS with an acetate addition of 200 mg/L mixture finished with the greatest phosphorus concentration, 98.2 mg P/L. Higher normalized P concentrations were achieved in the enhanced fermentation (Acid Sludge) experiments (28.4 mg P/g TSSWAS) than the acetate experiments values (11.3 to 14.7 mg P/g TSSWAS) because the initial P concentrations (67 mg P/L) were comparatively higher than in the acetate experiments (0.5 to 7.8 mg P/L). However, the greatest P release was seen in the mixture of 43% WAS and 57% primary sludge, by mass, with an addition of 200 mg/L acetate (23.4 mg P release/gTSSWAS). When modifying the pH in the 43% WAS and 57% primary sludge, it appears that pH 5.5 only yields a 12.6% increase in normalized P release, from 11.3 to 13.6 mg release/gTSSWAS.

INTRODUCTION

Enhanced biological phosphorus removal (EBPR) is a process commonly implemented in wastewater treatment plants (WWTP) because it is cost effective for maintaining low phosphorus effluents and good water quality in receiving waters. In EBPR, there is a net uptake of soluble phosphate as a result of intracellular polyphosphate accumulation (Grady et al. 1999). In addition, because polyphosphate is negatively charged, magnesium and potassium cations are also taken up by cells during EBPR (Wu et al. 2006).

When waste activated sludge (WAS) from EBPR plants is anaerobically digested, the soluble concentrations of phosphate, magnesium, and potassium inside the digester increase because of polyphosphate degradation. Furthermore, WAS digestion also releases ammonium from protein degradation, and therefore, high concentrations of ammonium, phosphate, and magnesium often result in the chemical precipitation of $MgNH_4PO_4 \cdot 6H_2O$ a crystalline solid called struvite (Corre et al. 2009). Excessive struvite precipitation leads to pipe scaling and equipment clogging in anaerobic digesters and side stream pipes, thereby increasing maintenance costs at WWTPs.

While addition of iron salts has traditionally been used to chemically fix phosphorus through precipitation of insoluble phosphate compounds (Corre et al. 2009), iron phosphate precipitates, such as vivianite ($Fe_3(PO_4)_2 \cdot 8H_2O$), can also cause serious scaling problems (Frossard et al. 1997). Therefore, there is a need for the development of original processes for minimizing chemical precipitation in anaerobic digesters. Chaparro and Noguera (2003) proposed the controlled release of phosphorus from WAS prior to anaerobic digestion as an alternative for reduction of phosphorus input to the digester. They suggested that combining WAS with either primary sludge, or the supernatant from a primary sludge dewatering process, could induce biological phosphorus release from WAS. Following phosphorus release and a subsequent sludge settling step, a phosphorus-rich side stream would be generated and could be chemically treated to precipitate phosphorus and produce a potentially marketable material. The dewatered sludge would then go to the anaerobic digester, carrying a reduced phosphorus load.

For this process to effectively control phosphorus levels inside the digester, the maximum possible phosphorus release should be achieved. In this study, we compared the approach of combining WAS with primary sludge described in Chaparro and Noguera (2003) with additional approaches, such as adding acetate to WAS in an anaerobic reactor, adding acetate to WAS/primary sludge mixtures, adjusting the pH of WAS/primary sludge mixtures, and mixing WAS with sludge from acid phase digesters. In addition to evaluating phosphorus release, we also quantified the release of magnesium from WAS. CS

Click HERE to return to Table of Contents

Click HERE to return to Table of Contents

Student Design Competition

Design Team: University of Wisconsin, Madison
Members: Beth Baumgartner, Forrest Bishop, Flory Olson, and Charley Otis
Level of Competition: Wastewater Design
Design Title: The North Plant

PROBLEM STATEMENT

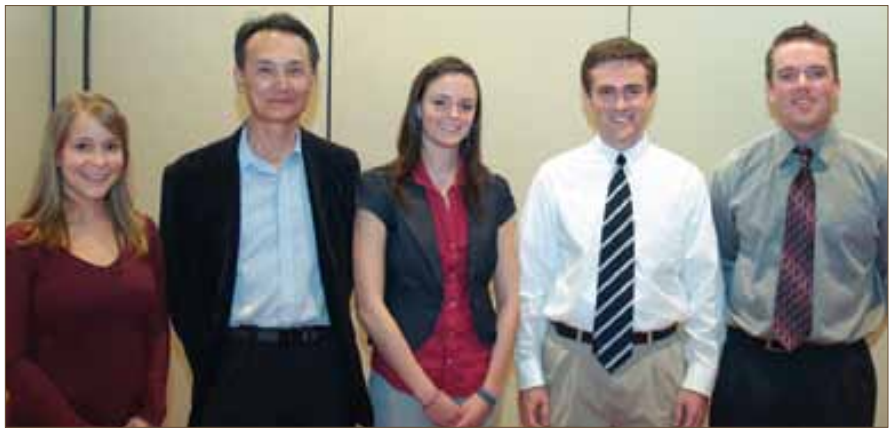
Currently, the Nine Springs Wastewater Treatment Plant located in southeastern Madison serves the Madison Metropolitan Sewerage District's wastewater needs. The Nine Springs plant serves 43 municipal customers, and has experienced a significant increase in average daily flows in recent years. In order to treat future flows due to predicted population increase and promote retaining and reuse of water within the Yahara River Watershed, the Madison Metropolitan Sewerage District 50 Year Master Plan discusses decentralizing treatment through the construction of satellite treatment plants.

One of the decentralized high quality effluent treatment facilities proposed would be located northeast of the Dane Co. Regional Airport, which is the plant we have chosen to design. The effluent would be used for streamflow augmentation, wetland restoration at the Cherokee Marsh, groundwater filtration, or industrial reuse of water.

For this competition, a preliminary wastewater treatment plant design will be completed to address the issues stated above. The estimated influent and effluent characteristics to be considered in the design, which were established by the Madison Metropolitan Sewerage District, are shown in Tables 1 and 2.

The goal of the wastewater treatment plant design is to meet the stringent regulations pertaining to Lake Mendota nutrient loading with low cost, proven technologies. The project will be nearly phosphorus neutral by discharging less phosphorus than the effluent requirements, thereby reducing the effects of eutrophication on Lake Mendota. CS

TABLE 1. Influent Characteristics
Inflow 5.18 MGD
Peak Hourly Flow 16 MGD
Biochemical Oxygen Demand (BOD5) 185 mg/L
Total Suspended Solids (TSS) 175 mg/L
Total Kjeldahl Nitrogen (TKN) 27 mg/L
Total Phosphorus (TP) 6.3 mg/L



L-R Beth Baumgartner, Jay Park, Flory Olson, Forrest Bishop & Charles Otis

TABLE 2. Effluent Characteristics		
Specification	Influent	Effluent (Limit) Decentralized Plant Effluent
BOD5	185 mg/L	7.0 mg/L < 2.0 mg/L
TSS	175 mg/L	10.0 mg/L < 5.0 mg/L
TKN	27 mg/L	< 3.0 mg/L
TN	4.0 mg/L	< 3.0 mg/L
TP	6.3 mg/L	0.05mg/L 0.04 – 0.05 mg/L
Bacteria		> 5 log removal
Virus		3 log removal
Turbidity		< 0.1 NTU

Click HERE to return to Table of Contents

Click HERE to return to Table of Contents

Student Design Competition

Design Team: Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign
Authors: Ian Bradley, Sheila Markazi, Peter Maraccini, Kim Parker, Thanh H. Nguyen
Design Title: Removal of Waterborne Viruses Using Iron-Amended Biosand Filters

ENGINEERS WITHOUT BORDERS USA

PROBLEM STATEMENT

1.1 billion people lack access to clean drinking water. Point of use (POU) water treatment technologies provide potable water for millions of people in developing countries that would otherwise not have access to it. Nearly 500,000 of the POU technologies in use today are biosand filters (BSFs), a household scale, intermittently operated slow sand filter. Although BSFs are effective against bacteria, protozoa, and helminthes, only 0.5-2 log removal of viruses has been shown. Students from the University of Illinois (UIUC) have formed the Guatemala Water Project, an Engineers Without Borders group, to directly address this problem. Implementation of BSFs in a rural Guatemalan village is being conducted in conjunction with the research and development of an improved filter. Laboratory studies were performed to determine if iron-amended BSFs could be designed to effectively remove human enteric viruses from source water while maintaining the original efficacy of the BSF. Iron oxides formed during iron corrosion create positively charged surfaces to which negatively charged virion particles are adsorbed and inactivated due to electrostatic interactions. Initial studies were performed using three glass columns to simulate a daily, one pore volume charged BSF using different orientations of iron. These columns were pumped with aquifer water seeded with MS-2, a bacteriophage commonly used as a surrogate for human enteric viruses, and tested for long term efficacy. After 71 days, each column had approximately 6-log removal, compared to 0.5-log removal by a fourth column with no iron. Plastic BSFs with and without mild steel nails as a source of iron were tested for the removal of MS-2 and Escherichia Coli. Then, concrete BSFs with and without commercially available iron particles were tested for the removal of MS-2. After approximately one month, the filter with iron particles sustained nearly complete

L-R. Alyssa Sohn, Paul Folwarski & Anthony Straub

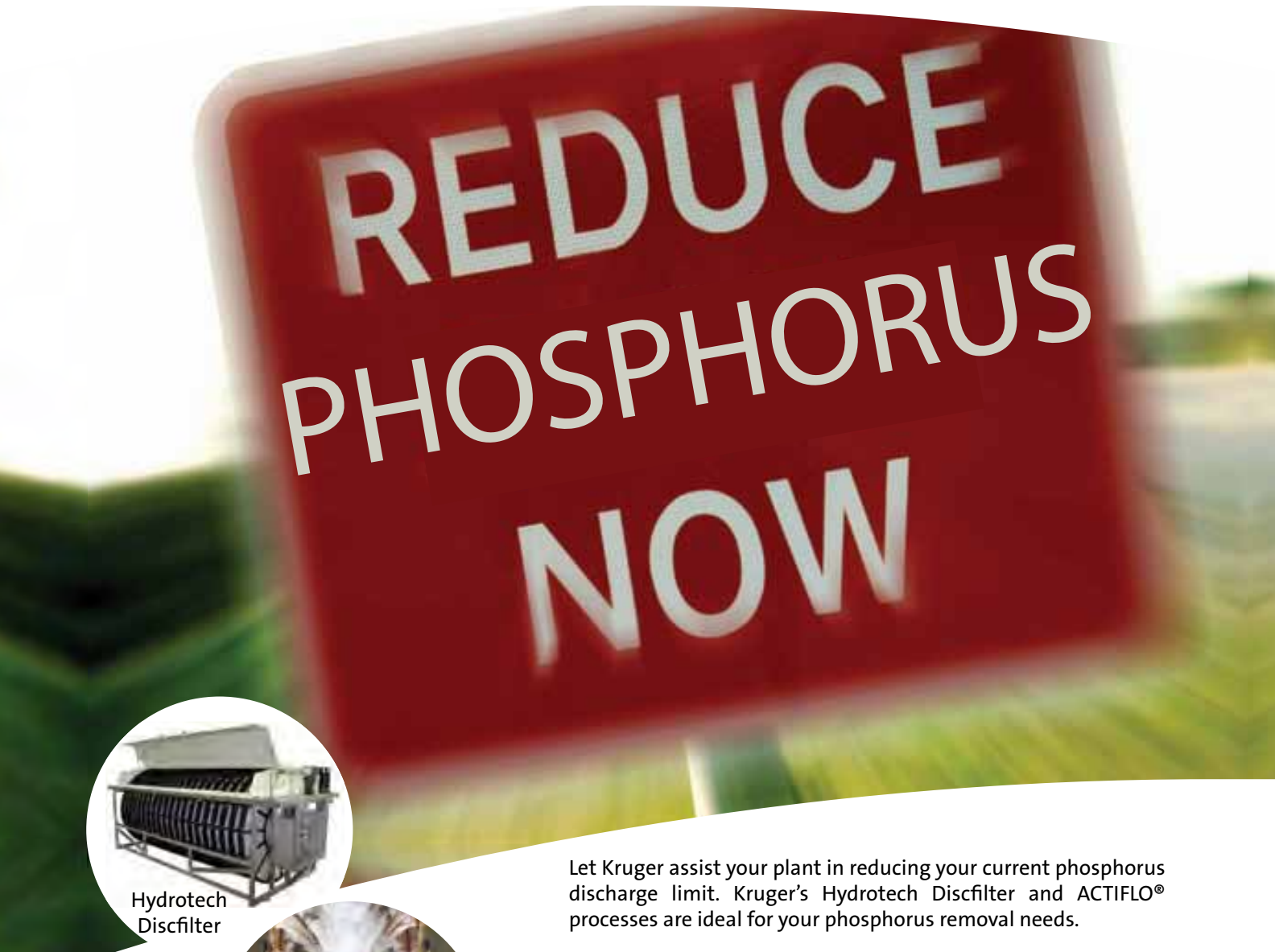
removal of MS-2, between 5 and 7-log (99.999-99.99999%). All large-scale filters were also tested for pH, alkalinity, dissolved oxygen (DO), nitrates, ammonium, chloride, turbidity, iron, and other parameters to ensure World Health Organization standards were met. With the successful removal of viruses, iron-amended filters provide a simple, economical, and effective solution to one of today's most pressing issues. With 350,000-500,000 BSFs in current use, and an estimated eight users per filter, between 2.8 and 4 million people could attain higher quality water and see drastically reduced rates of infection. CS

"Students from the University of Illinois (UIUC) have formed the Guatemala Water Project, an Engineers Without Borders group, to directly address this problem."

Click HERE to return to Table of Contents

KRÜGER

Meet Phosphorus Limits with Kruger Technologies



Hydrotech Discfilter

ACTIFLO®

Let Kruger assist your plant in reducing your current phosphorus discharge limit. Kruger's Hydrotech Discfilter and ACTIFLO® processes are ideal for your phosphorus removal needs.

- Proven performance and experience backed by a large installation list
- Small footprint
- Meets effluent phosphorus concentrations from 0.5 to 0.05 mg/l
- Easily able to retrofit into existing facilities

401 Harrison Oaks Blvd., Suite 100
Cary, NC 27513
Phone: 919.677.8310
Fax: 919.677.0082
krugerincmarketing@veoliawater.com
www.krugerusa.com

VEOLIA WATER
Solutions & Technologies

Stockholm Junior Water Prize

Editor's note: Christopher Welker is the WI Section CSWEA's representative to the Stockholm Junior Water Prize 2010 competition in Saint Louis this June. Presented here are the highlights of his project. The full project can be viewed at www.cswea.org.

THE EFFECTS OF DIFFERENT GENERA OF ALGAE ON THE PHOSPHORUS EXCRETION AND OXYGEN DEPLETION OF QUAGGA MUSSELS (DREISSENA BUGENSIS)

By Christopher Welker

ACKNOWLEDGEMENTS

I would like to thank Harvey A. Bootsma, PhD and Ms. Erin Wilcox. Dr. Bootsma is an associate scientist with the Great Lakes WATER Institute, University of Wisconsin-Milwaukee. He is an expert in the areas of algal ecology and aquatic food web dynamics and I had the good fortune to be able to work with him. Ms. Wilcox is a research specialist in Dr. Bootsma's lab. I am very grateful for their help and ideas. They donated their laboratory space, equipment and, most importantly, their precious time to help me succeed.

I would also like to thank Mr. Stresman, my Biology teacher, for meeting with me at the beginning of the project and suggesting that I meet with Dr. Bootsma.

Finally, I would like to thank my Mom and Dad. They supported, drove, encouraged, and helped me so much, thanks to you both.

STATEMENT OF THE PROBLEM

The Quagga mussel (Dreissena bugensis) is an invasive species whose population is growing rapidly in the Great Lakes water system as well as other inland lakes and rivers throughout the United States and even the world. Quagga mussels are efficient filter feeders, they have razor sharp shells, they reproduce quickly, they have no natural predators, and they can easily adapt to extreme conditions. As proficient filter feeders, Quagga mussels siphon certain algae which upset the Great Lakes food web. This siphoning increases water clarity levels which cause the filamentous green algae, Cladophora, to grow. Cladophora washes up on beaches causing a noxious smell and unpleasant sight. Cladophora also increases phosphorus levels in lakes which, in turn, increase blue-green algae blooms which produce a toxin that, if ingested, can create liver problems. As good adaptors, Quagga mussels can live in either shallow or deep water and have been found at depths of up to 130 meters. When people swim or play in near shore areas, they are subject to cuts from Quagga mussel shells. In deeper water, Quagga mussels clog underwater intake pipes and grates for water treatment plants and other facilities. This reduces the pumping capabilities of these businesses which is costly to repair. This experiment is intended to help science determine which algae Quagga mussels ingest the most. Algae ingestion can be determined by measuring the mussels' phosphorus excretion and oxygen depletion. Scientists can use this knowledge to understand more about Quagga mussels and their contribution to the Great Lakes ecosystem.

ABSTRACT

The purpose of this study was to help scientists find out about the highly invasive, nuisance Quagga mussel (Dreissena bugensis) by investigating its diet in a controlled laboratory environment, which has not been done before. It was predicted, based on observations in their natural environment, that Quagga mussels would eat more of certain genera of alga, Selenastrum, Cyclotella and Peridinium than of the

Click HERE to return to Table of Contents

Stockholm Junior Water Prize

"In deeper water, Quagga mussels clog underwater intake pipes and grates for water treatment plants and other facilities. This reduces the pumping capabilities of these businesses which is costly to repair."

yanobacterium, Gleocapsa. Consumption of algae by Quagga mussels requires the utilization of oxygen and results in the excretion of phosphorous. Therefore, two separate measures of consumption were used as dependent variables in this experiment: (1) SRP (Soluble Reactive Phosphorus) samples, and (2) dissolved oxygen samples. The independent variables were the four different genera of algae. The experiment took place in a controlled environment with a temperature of 15 degrees Celsius, in 20 liter tanks, with equal numbers of Quagga mussels per tank, constant light conditions, and equivalent concentrations of algae per tank. Two significant differences in the SRP category were found by using an Analysis of Variance (ANOVA) followed by multiple t-Tests. These results showed that the consumption of Selenastrum and Peridinium was greater than that of Gleocapsa. There were no statistically significant differences in the measures of dissolved oxygen. Based on the measures of SRP, the experimental hypothesis was correct. Gleocapsa was the least consumed algae; this is thought to have happened because Gleocapsa has been found to be poisonous to Quagga mussels. Selenastrum and Peridinium were the most ingested; they are both nutritious for Quagga mussels. If this experiment were to be repeated, it is recommended that the sample size be increased and that temperature and depth of water be varied. It is possible there were no differences in the measures of dissolved oxygen because the Quagga mussels had been separated from their sources of algae for two hours because the SRP testing occurred first. This may be too long to wait to measure dissolved oxygen. Next time the Quagga mussels could be reintroduced to the algae and the dissolved oxygen testing could be performed immediately. CS

Click HERE to return to Table of Contents

Click HERE to return to Table of Contents

Stockholm Junior Water Prize

Editor's note: Logan Pallin is the MN Section CSWEA's representative to the Stockholm Junior Water Prize 2010 competition in Saint Louis this June. Presented here are the highlights of his project. The full project can be viewed at www.cswea.org.

ENGINEERING A RAIN GARDEN TO CONTROL ROAD RUN-OFF IN SCANLON CREEK AND AN ASSESSMENT OF RAIN GARDENS AS THE BEST STORM WATER MANAGEMENT PRACTICE – Phase IV

Logan Pallin
Environmental Management, Grade 12, Cloquet, Minnesota

Advisor: Cynthia Welsh
Rain Garden built by researcher on Scanlon Creek

ABSTRACT

The objectives were: to reengineer a new rain garden that can treat a 25-year rain event, determine the effect a rain garden has had on the health of a trout stream, macroinvertebrate predator/prey interactions over four years, if modified Hester-dende samplers can predict the effects of construction generated road run-off on macroinvertebrate populations, and if rain gardens are the best storm water treatment process. Water quality sampling was done from a 10 meter reach before and after a rain garden construction site over a four-year period. Modified Hester-dende samplers were again used to simulate an embedded and non-embedded stream situation (allowing/limiting predation). Infiltrometer readings were compared to other local rain gardens. As an expansion of last year's study a new rain garden design was engineered and implemented. When the road run-off treated section of the stream was compared to upstream (during phase one and two of this study) the rain garden had a positive effect on temperature, discharge, pH, conductivity, Family Biotic Index (FBI), macroinvertebrate density, and diversity of food processing groups. During phase three the rain garden's positive effect diminished for some variables: oxygen, temperature, discharge, conductivity, pH, and clarity. After rain garden maintenance during phase four, oxygen, and temperature levels improved. Scanlon Creek's rain garden infiltration rates were significantly lower than all rain gardens in the area for the past two years, positively affecting FBI and diversity. The reengineered rain garden size was increased by 108 square feet to accommodate a 25-year rain storm event.

ACKNOWLEDGEMENTS

While doing research projects and participating in science fair events, I have been very fortunate to work with many in the community. Two years ago Dr. Kris Evans, an environmental engineer, helped develop an environmentally appropriate rain garden design based on the stream site. Larry Shelton, an excavator, was sent a grant proposal asking for his assistance in building the rain garden. Shelton Excavating then decided to support this project. On the day the rain garden was built Shelton provided the large machinery and professional operators to run them as well as the materials needed for the garden. The Shelton Excavating Co. has also been there to make repairs when necessary. I would like to thank Patricia Fowler, from the Minnesota Pollution Control Agency, for granting permission to build the rain garden near the designated trout stream. Larry Shelton and Dr. Kris Evans also emailed Patricia Fowler with their support of the design. Without the help of Shelton Excavating, Dr. Kris Evans and Cloquet city planner James Prusak, the planning, organizing and construction of the rain garden would have been impossible. I'd also like to thank Amber Westerbur from Western Lake Superior Sanitary District (WLSSD), for allowing me to test their rain gardens, and David Vlassin from the Ramsey Soil and Water Conservation District for his assistance on infiltrometer use. As a ninth-grader I was not knowledgeable enough to plan the actual rain garden design, because I want to be an Environmental Engineering one day, this year, Jerome Flogel mentored me through the design process and construction. And most of all, I'd like to thank science teacher Dr. Cynthia Welsh, my mentor. She has put many hours into helping me with my project; I couldn't have been so successful without her.

INTRODUCTION

The Environmental Protection Agency (EPA) believes that storm water run-off is the main source of fresh water contamination. Road run-off may not only contain chemical contaminants, but a tremendous amount of sediment. This sediment covers the benthos (bottom of the stream) altering macroinvertebrate habitats. Embeddedness rates the degree to which rocks, gravel, cobble,

Click HERE to return to Table of Contents

and boulders are covered or sunken into the stream benthos. As rocks become embedded, the surface area available for macroinvertebrates and fish decreases. Kick nets are often used to collect macroinvertebrates. The net is placed in the stream allowing the water to flow through the net while capturing the insect larvae. Furthermore, storm water run-off often carries the embedding sediments created from human interactions within a stream's watershed.

Society is expanding at a rapid rate. This expansion occurs during the rapid construction of homes and roads. Construction zone run-off is considered one of the main non-point source pollution contributors. Non-point source pollution is created when rainfall or snowmelt drains over hard surfaces and through the ground. While moving, this drainage water picks up and carries away natural sediments, as well as human-made pollutants. Ultimately, the pollutant-laden water flows into our lakes, rivers, wetlands, and coastal waters, polluting and finding a way into our underground sources of drinking water. These pollutants include sediments mixed with excess fertilizer, oil, grease, acid drainage from abandoned mines, and bacteria from animal waste.

As far back as 1972, biologists were not the only group concerned, but the general public began to notice the degradation of our nation's waterways. This concern led the federal government to enact the *Federal Water Pollution Control Act*. In 1977, this law became known as the *Clean Water Act* (CWA). Originally, CWA's main focus was point-source (industrial effluent) pollution. By the late 1980s, an effort to assess the impact polluted non-point source run-off was having on our waterways increased. Volunteer programs were established to determine a baseline water quality level while also monitoring local waterways. A regulatory approach has now been established to monitor "wet and dry weather point sources" that may be entering through urban storm sewer systems and construction sites.

Initially, after a building site is cleared and before construction is initiated, surface erosion begins to occur, often at a rate 150 times greater than before work began. Consequently, during a short period, building sites can contribute more non-point sediment to waterways and drainage systems than would normally be deposited over several decades. The specific effects of non-point source pollutants on waterways vary and are difficult to fully assess. However, scientists know that these pollutants are negatively impacting our world's drinking water supply, water recreation, fisheries, and wildlife.

Rain gardens serve as one impervious pavement run-off treatment that may help to minimize embeddedness. Rain gardens capture, slow down, and infiltrate the rain run-off that flows from roads, roofs, and other hard surfaces. They are planted with native vegetation which then uptake some of the water and pollutants from the run-off. Rain garden plants use rainwater run-off, thus conserving water, as well as helping to protect the water quality of our lakes and rivers. These plants are naturally found near aquatic ecosystems so they are hardy and low maintenance.

There are a wide variety of ways to construct a rain garden. For a standard rain garden, a shallow depression is dug into the ground. The circumference of the rain garden depends on the calculated volume of water that one would expect to flow into the rain garden during a storm event. A shallow swale (ipraff) covered in blast rock directs rain water toward the rain garden. The variety of native plants planted in the garden depends on the type of soil and soil moisture levels. Some plants grow better in soils with higher moisture content while others prefer a dry environment. The native vegetation planted in the center of the rain garden requires more moisture, while vegetation planted on the outside of the garden requires less water. Depending on the soil type, soil moisture, and the characteristics of the area, different layers and materials are added to the rain garden.

Currently, the education of landowners near waterways has increased, including the availability of tools shown to stop sediment from flowing into rivers. Such tools include rain gardens, pervious pavement run-off treatments, and for bigger parking lots and/or run-off entry sites, infiltration islands and grass overflow parking areas. One way to examine the efficiency of rain gardens is to calculate and compare their soil moisture content and infiltration rates. Infiltration measures the volume of water that can flow through the soil in millimeters/hour. Over time rain garden infiltration rates may decrease as urban expansion and road run-off increases. Consequently, methods need to be developed that allow stream ecologists to proactively predict the impact of non-point source generated run-off, as well as determining if rain gardens are the best way to manage storm water run-off. Even with the increased efforts to educate the public and regulate run-off, little is known concerning the impact that road run-off and non-point source pollution are having on stream ecosystems. CS

This article is reprinted with permission from *Washington State Public Works* magazine.

Biologicals for FOG Pretreatment: To Dose or Not to Dose?

By Michael Boschitsch

The debate of whether to allow the use of biologicals at source to deal with FOG (fats, oils, and grease) rages on. It does so in large part, because of an inadequate understanding of both the biochemistry involved as well as the statutes around it. A little knowledge is a dangerous thing and developing *effective* FOG statutes requires more than just a little dangerous knowledge.

First let's understand what we mean by biologicals. For FOG pretreatment, these are typically divided into two main categories: enzymes and bacteria. Enzymes are not a live "biological" per se, in fact they are typically a protein generated by live organisms and act as a catalyst for other reactions. For instance when we chew food, our saliva contains enzymes that break down the food for easier digestion. For FOG control, lipase, the enzyme of choice, breaks down fat molecules into their smaller components of glycerol and fatty acid for consumption by bacteria. Used alone, however, enzymes only do half the job. Because they are not live organisms, they don't actually consume FOG – they simply break it down or emulsify it. Emulsification is when the fat that goes into the drains is converted into tiny little droplets that essentially become one with the water that carries it away. What this means in food service is that grease traps that rely on the *separation* of fat from water become ineffective as the emulsified fat passes straight through the trap and into the city sewers where dilution allows the fat to recombine. As far as municipal operations are concerned this is not the best solution as FOG producers simply pass the problem along to them.

Bacteria, in contrast, are living organisms. Bacteria secrete their own enzymes to break down the fat molecule into bite size pieces, and the bacteria then complete the job by consuming the glycerol and fatty acids leaving behind mainly water and minute amounts of C02. Don't worry about the CO2 though, because amounts are negligible compared to the impact of pumping out the drains and sewers, disposal and processing of the effluent, periodic overflows into storm drains and disposal of fat into landfill.

But not all strains of bacteria are created equal. Bacteria can be broken down into spore formers and non-spore formers. Spore formers protect themselves in harsh environments by surrounding themselves with a protective outer layer or spore. If conditions become uncomfortable, such as high or low pH, high tempera-

Click HERE to return to Table of Contents

ture, turbulence, etc. the spore comes on and the bacteria hunkers down and weathers out the storm. The downside is that in its spore state, this bacteria doesn't consume but becomes dormant until conditions become more civilized. Spore formers are the bacteria of choice in digestion ponds at waste water treatment facilities where conditions are pH balanced, with average temperatures and little turbulence.

In a dynamic system such as a kitchen or food service establishment, however, conditions are unfavorable throughout the day. Discharges from sinks, dishwashers and floor drains tend to be caustic, hot, surfactant laden water with significant turbulence as the water runs through the pipes. Once the spore is formed, it can take up to 36 hours before the bacteria becomes active again and until then, no fat is being consumed and many of the bacteria are simply washed away with little effect other than adding to the biomass that already exists within the sewer system. As a result, spore forming bacterial systems are often dosed at night. Without any actual water flow through the drains, however, spore formers can't move very far and are slow to colonize before being washed away again by the next day's activities.

Non-spore formers, as the name would suggest, don't form spores. They tend to be hardier and are active within a larger range of environments and unless frozen or dead, they exist in a perpetually active state. What this means is that as soon as they are introduced into a drain or sewer system, they go to work right away, consuming many times their volume in FOG. They too, will die and add to the biomass, but not before converting significantly more FOG into water. As a result, for dynamic systems as typically found in food service environments and even municipal sewer systems, non spore forming bacteria are most effective.

Another area of confusion is that of the statutes themselves. Many jurisdictions state that no additives may be introduced to the grease trap or may be used in order to pass grease through the grease trap. This makes perfect sense, in that a grease trap is supposed to trap grease and prevent it from entering into the sewer system. An enzyme, as an emulsifying agent does exactly that – moves the FOG through the grease trap and beyond. Adding bacteria to a grease trap is not helpful in that the trap is a very poor environment for bugs to colonize or be effective. Instead, they simply add to the biomass. Where bacteria are useful, is in keeping the drain lines clean leading up to and away from the grease trap. Without proper maintenance, a grease trap will allow FOG to pass through at the best of times and bacteria go a long way to mitigating the impact of FOG that moves past the grease trap.

Unfortunately, many inspectors and regulators read the restriction to mean that the use of any biological in the drain system is 100% forbidden, which is very rarely the case. Disallowing all biologicals because some applications are harmful is like disallowing all vehicles on public roads in order to reduce traffic accidents. The severity of the impact of FOG on public infrastructure and funds, demands that municipalities explore every proven means available to combat this silent demon. As with any effective solution, we simply have to use the right tool for the job and to do that we must educate ourselves as to what tools there are and how they work. CS

Click HERE to return to Table of Contents

Outreach and Engagement

By Eddie McCall

It is a great honor for me to serve as your Chair of the Illinois Section of CSWEA. I have big shoes to fill, left behind by the Chairs of years past. Nonetheless, I embrace this challenge and I am eager to lead the Section forward over the coming year. To facilitate this endeavor, I will be working closely with the talented individuals on the Section committees. The unique skills and expertise of each committee member will be instrumental in building the Illinois Section into an even stronger, more vital, and far reaching organization. As Franklin D. Roosevelt once wrote, "People acting together as a group can accomplish things that no individual acting alone could ever hope to bring about."

Under the leadership of Gary Scott, the past year proved to be very successful for the Illinois Section. My goal as this year's Section Chair is to continue to build on Gary's success by focusing on the following:

- Continuing to brand the organization
- Continuing to build strong committees and technical seminars
- Continuing to increase member recruitment and engagement

I will work with the Section committees to continue to brand the Illinois Section of CSWEA as a place where professionals come to network, gain knowledge, and obtain their professional development credits. In these difficult economic times where budgetary constraints are all too common, it will be even more important to emphasize the value that membership and involvement in our organization affords each individual.

As we learned from the success of the recent one-day educational seminar in Madison, Wisconsin, and from other Section events, a strong program is critical for the success of our technical seminars. I will work with each committee Chair to recruit individuals to help build even stronger programs for the technical seminars. The talented and committed professionals currently serving as committee Chairs (Mark Eddington, Gary Scott, John Szwedo, Roger Gyger, Mary Dressel, Rich Hussey, and Scott Trotter) will ensure the success of this endeavor.

Finally, the future success of every great organization depends not just on the involvement of its existing members but also on the recruitment and engagement of new members. I will continue to encourage young professionals from all backgrounds to actively participate in Section events. In addition, continued engagement of more senior professionals from the municipal and private sectors will be a critical success factor. Over the course of the current year, my goal is to continue to increase outreach and engagement such that the success of the past will be carried into the future.

In closing, I am very excited to lead this Section and, with the support of all of you, I am looking forward to taking it to an even higher level of success. CS

"I will work with the Section committees to continue to brand the Illinois Section of CSWEA as a place where professionals come to network, gain knowledge, and obtain their professional development credits."

Click HERE to return to Table of Contents

Drag Someone Along

By Keith Haas

I have always looked at life as a passport booklet getting my book stamped from every turn my career takes me. It's kind of like visiting all the countries at EPCOT and getting your passport stamped as you pass through the park. This year I received a stamp of approval to become the Section Chair for the Wisconsin Section of Central States. I am honored to have been handed the gavel in Madison in May 2010. The Section is in great shape thanks to the leadership of Jim Beier and the continued dedication of David Arnott to keep us on an even and consistent keel. Our other assets are the membership and the committees that we have. We continue to provide excellent programs throughout the year for our members and colleagues.

My theme for the next year is "Drag someone along". Ten short years ago someone dragged me along to a CSWEA annual meeting and today I am the Chair. I have met many great people in the industry in the past ten years and continue to meet a select group of dedicated professionals who have shaped and molded our section to what it is today.

Summer is finally here and seems shorter every year. While the economy is slowly recovering, we are facing issues of phosphorus, arsenic, SSOs and more mandates from our regulators. Where will it all end? One thing is for sure, we will all be a lot smarter when we are done with the process of dealing with the legal aspects of wastewater treatment.

The annual meeting in Madison at Monona Terrace was a great event. The local arrangements committee did an excellent job despite cool weather. David Arnott ran the Wisconsin State Section breakfast meeting and did an admirable job. Special thanks to outgoing chairperson Jim Beier who infused his energy into the section over the course of the past year. The technical program was interesting and covered the gamut of many projects and issues we are dealing with in our industry. Special thanks to the exhibitors as well who showed me several interesting new products that are available to help our industry move into the next decade.

The CSWEA CSX-YPX event is scheduled for July 15 and 16 in the Wisconsin Dells at the Kalahari Resort. We hope to see you and your family there for some fresh ideas about our future and a relaxing inner tube float on the lazy river. WEFTEC is in New Orleans October 2-6 for any of you fortunate enough to attend.

In keeping with our theme for 2010, when you plan to attend your next technical seminar offered by CSWEA remember to "drag someone along". For many of us we will be handing the reigns of our careers and service work to a younger member of our profession in a shorter time frame than you might think. It is important to keep an enthusiastic perspective with our younger members as our future is in their hands. CS

"My theme for the next year is "Drag someone along". Ten short years ago someone dragged me along to a CSWEA annual meeting and today I am the Chair."

Click HERE to return to Table of Contents

Blueprint for the Coming Year

By Ted Field

As the new chair of the Minnesota section, my first thoughts are about the size of the shoes I have to fill. Jason Benson did a wonderful job guiding the section last year and set a standard I will try to match in leading the section this year.

In the coming year the Minnesota section will be served by other new leaders, John Friel as Vice-Chair, Alison Sumption as Secretary/Treasurer, and John Glatzmaier as Trustee. Together, along with several other volunteers who are continuing their service to our cause, we look forward to maintaining successful traditions and supporting new ideas and initiatives.

Many of us are returning to our routines after having attended the 83rd Annual CSWEA meeting in Madison. Despite a slight decline in attendees, the meeting was a success, with a great variety of events and programs, including no shortage of strong technical presentations that spanned the breadth of relevant issues our industry faces today, from new technology to tried-and-true management practices. Through it all there was fellowship and fun. The Minnesota section is looking forward to hosting next year's meeting with the same success at the Northland Inn in Brooklyn Park.

Already, the section is talking about the subjects we want to tackle in the coming year. Greg Johnson will take the lead of the Government Affairs Committee and has begun to address the regulatory issues that impact our region. One of the first orders of business will be to work with the other sections to review and comment on the draft arsenic TMDL for a segment of the Mississippi River.

We're in the planning stages for our annual Conference on the Environment, which we co-host every fall with the Air and Waste Management Association. The conference is Tuesday, November 9 at the Earle Brown Center in Brooklyn Center. And, of course, before this summer ends, we will be gathering in Grand Rapids the last week in July to learn, celebrate and exchange ideas at the MWOA Conference, at a great venue for outdoor activities where the sun, water, forests, and fairways beckon.

In his message this past spring, Jason wrote about an upcoming project on which I'd like to expand. The project is *Blueprint Minnesota: Liquid Assets*, a film documentary the Minnesota section of CSWEA is strongly promoting and is taking a lead in contributing funds toward its production. I look forward to being part of this important project.

If you stopped by the CSWEA exhibit table at the annual meeting in Madison you may have viewed part of the video that was on display. The video was *Liquid Assets, The Story of Our Water Infrastructure*, and was produced by Penn State Public Broadcasting with the support of numerous organizations including WEF, ASCE, and AWWA. The video, which provides a conceptual outline for our documentary, illustrates and describes the water and wastewater systems on which our lives depend. It educates general audiences about the many pipes under our busy streets, what they do, where they go, and how vital they are to society and our way of life. Its audience includes schools, various public-interest groups, interested citizens, and civic leaders – in other words, the stakeholders who use these systems and want them to perform well.

But the video also sounds an alarming message that our infrastructure is suffering from neglect and that without a strong commitment to keep it whole our future could be in trouble. So, the video is also a call to action. Its audience can also include legislators and policy makers.

Our goal is to produce a similar documentary, but one with a more regional focus. The documentary will demonstrate the value of Minnesota's water resources, our pride in these resources, and what must be done to protect them. When it's done our *Liquid*

Click HERE to return to Table of Contents

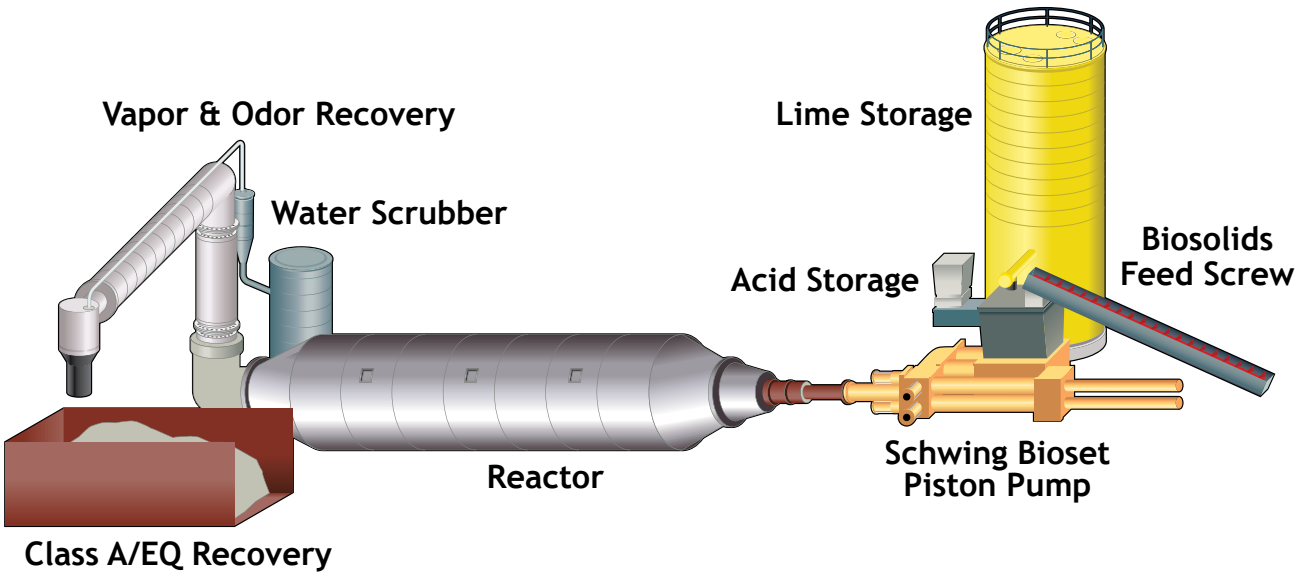
Assets will be aired several times on public television and copies will be made available to distribute and show to interested groups. So far, we have raised a little over half of the $30,000 needed for its production. Everyone can help in a variety of ways, but the immediate need is expanded sponsorship. Check out www.blueprintMN.com for more information.

Lastly, our section provides numerous opportunities for everyone to serve, opportunities to grow professionally and give your time and talents back to our great organization. Check out the list of committees and committee chairs at www.cswea.org/minnesota. Contact the chair of the committee you'd like to join and offer your help. They'd love to hear from you. CS

Click HERE to return to Table of Contents

How do you convert sludge into Class 'A' Biosolids?

Get the right equipment



The staff at the Dane-Iowa WWTP in Mazomanie, WI and the West Central Wisconsin Biosolids Facility in Ellsworth, WI installed the **Bioset** process after recognizing the benefits of producing Class 'A' biosolids. One of the features of the **Bioset** process that appealed to plant staff was its ability to integrate seamlessly into their existing operations without requiring any additional Operators or Mechanics. Other key selection criteria included:

- Low capital and operating costs
- Minimal maintenance and ease of operation
- Consistent production of Class 'A' biosolids with long-term stability
- A clean system that operates virtually free of dust and odor

These were important items for the Dane-Iowa WWTP and the West Central Wisconsin Biosolids Facility. The question is, what is important to you?

Schwing Bioset, Inc.
350 SMC Drive
Somerset, WI 54025
www.schwingbiosetcs.com

SCHWING BIOSET

JULY

CSWEA-CSX 2010
July 15-16, 2010
Kalahari Resort
Wisconsin Dells, WI

IL Section/IWEA Laboratory Seminar
Late Sumer, 2010
Downers Grove Sanitary District
Downers Grove, IL

MWOA 34th Annual Conference
July 27-30, 2010
Grand Rapids, MN

WI Section Collection System Seminar Northwoods
July 29, 2010
Marshfield, WI
Pre-conference Golf Outing

AUGUST

WI Section Management Seminar
August 5, 2010
Cabela's
Richfield, WI

OCTOBER

WEFTEC 2010
October 2-6, 2010
New Orleans, LA

CSWEA-IWEA WEFTEC '10 Welcome Reception
October 3, 2010
Hilton New Orleans Riverside
New Orleans, LA

NOVEMBER

MN Section CSWEA/A&WWA Conference of the Environment
November 9, 2010
Earle Brown Heritage Center
Brooklyn Center, MN

FEBRUARY 2011

MN Section CSWEA/MWOA Annual Innovative Conference
February, 2011
St. Cloud, MN

Click HERE to return to Table of Contents

COMPANY	WEBSITE	TELEPHONE	PAGE
Advanced Engineering and Environmental Services (AE2S)	www.ae2s.com	763-463-5036	7
Advanced Valve Technologies	www.avtfittings.com	877-489-4909	9
AECOM	www.aecom.com		37
American Flow Control	www.acipco.com		42
Aqua Backflow	www.aquabackflow.com	866-777-2124	59
Baxter & Woodman, Inc.	www.baxterwoodman.com	815-459-1260	57
Berryman Equipment Company	www.berrymanequipment.com	800-605-0099	53
Black & Veatch	www.bv.com	312-346-3775 – IL 952-545-6695 – MN	59
Boerger, LLC	www.boerger-pumps.com	877-726-3743	21
Bolton & Menk, Inc.	www.bolton-menk.com	507-625-4171	34
Bonestroo	www.bonestroo.com	651-636-6400	51
CDM	www.cdm.com		54
Clark Dietz, Inc.	www.clark-dietz.com	262-657-1550	56
Crane Engineering	www.craneengineering.net	920-733-4425	30
Crawford, Murphy & Tilly, Inc.	www.cmtengr.com	217-787-8050	16
Degremont Technologies	www.degremont-technologies.com	804-756-7600	13
Donohue & Associates, Inc.	www.donohue-associates.com	920-208-0296	OBC
DYK Incorporated	www.dyk.com	800-227-8181	IFC
ECO2	www.eco2tech.com	317-706-6484	29
Energenecs	www.energenecs.com	800-343-6337	39
Farnsworth Group	www.f-w.com		57
Force Flow	www.forceflow.com	800-893-6723	29
Foth	www.foth.com	800-236-8690	3
Greeley and Hansen	www.greeley-hansen.com	800-837-9779	34
Hawkins, Inc. (Water Treatment Group)	www.hawkinsinc.com	612-331-9100	49
Howard R Green Company	www.hrgreen.com	888-368-4389	31
ITT Water & Wastewater USA Inc. - Flygt Products	www.flygtus.com	800-661-9944 – IL 800-232-1417 – WI	5
ITT Water & Wastewater USA Inc. - Sanitaire Products	www.sanitaire.com	414-365-2200	IBC
J & S Valve and Manufacturing	www.JandSValve.com	866-498-4283	26
KLM Engineering, Inc.	www.klmengineering.com	888-959-5111	49
I.Kruger, Inc.	www.krugerusa.com	919-677-8310	46
L&J Technologies Company	www.shandandjurs.com	708-236-6000	27
LAI, Ltd.	www.LeyAssociates.com	847-392-0990	49
Master Meter	www.mastermeter.com	817-842-8000	17
McMahon Associates, Inc.	www.mcmgrp.com	920-751-4200 800-323-1665	37
Metropolitan Industries Inc.	www.metropolitanind.com	800-323-1665	57
M.E. Simpson Co. Inc.	www.mesimpson.com	800-255-1521	48
Mulcahy/Shaw Water, Inc.	www.mulcahyshaw.com	262-241-1199	38
Noren Products	www.norenproducts.com	866-936-6736	59
Northern Lake Service Inc.	www.nlslab.com	800-278-1254	48
Oldcastle Precast	www.oldcastleprecast.com/wastewater	888-965-3227	43
Pollardwater.com	www.pollardwater.com	800-437-1146	15
Process Equipment Repair Services, Inc.		262-629-1059	35
Rain for Rent	www.rainforrent.com	800-742-7246	42
Ruekert-Mielke	www.ruekert-mielke.com	262-542-5733	40,57
Schwing Bioset, Inc.	www.schwingbiosetcs.com		58
Severn Trent Services	www.severntrentservices.com	866-646-9201	44
Short Elliott Hendrickson (SEH)	www.sehinc.com	800-325-2055	40
Smith & Loveless Inc.	www.smithandloveless.com	800-898-9122	40
Strand Associates, Inc.	www.strand.com	608-251-4843	45
Symbiont	www.symbiontonline.com	414-291-8840	44
TKDA	www.tkda.com	651-292-4400	55
Trotter & Associates Inc.	www.taiengr.com	630-587-0470	25
University of Wisconsin-Madison	www.epd.engr.wisc.edu	800-783-6526	3
Van Bergen & Markson, Inc.		800-422-0791	44
WeirWasher/Gilltrading.com	www.weirwasher.com	866-447-2496	35
WSB & Associates, Inc.	www.wsbeng.com	763-541-4800	24

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 endeavoured 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.

Click HERE to return to Table of Contents

CSWEA Associate Membership Application

Contact Information

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

Employment Information

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

Associate Membership in Central States Water Environment Association

CSWEA Associate Membership Benefits include: Central States Water Magazine and Member price for CSWEA and Section Events	Dues cover a one year period, and must be renewed annually.	DUES
* I am a Young Professional (35 yrs or younger, less than 10 work experience) ☐ Please send me info on YP Events	Renewal notices will be sent one month prior to anniversary date.	$ 20.00

Payment Information

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

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

Mailing Information

Send Form & Payment to: Central States Water Environment Association, 3809 Shenandoah Drive, Crystal Lake, IL 60012
Call 815-954-2714 for additional information or visit www.CSWEA.org

Click HERE to return to Table of Contents

Water Environment Federation®
Preserving & Enhancing the Global Water Environment

Join CSWEA & WEF Now! Membership Application

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

☐ **Please send me information on special offers, discounts, training, and educational events, and new product information to enhance my career.** ☐ **by email /** ☐ **by fax**

Member Association (MA) Choice: Central States Water Environment Association

Employment Information

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

Sponsorship Information

WEF Sponsor Name & Sponsor ID Number:	ACQ.Code for WEF use Only GENI

Membership Information

Membership Categories *Select one only*	**Member Benefit Subscription** *Select one only*	DUES
☐ **ACTIVE**		$ 102.00
Individuals involved in or interested in water quality. **Young Professional**	☐ *WE&T* (including *Operations Forum*)	
	☐ *WEF Highlights Online* ☐ Central States Water Magazine	
	YP=<35 yrs of age, < 10 yrs work experience can receive 50% discount for 1st three years of membership	$ 51.00
☐ **OPERATIONS**		$ 64.00
Individuals involved in the day-to-day operation of wastewater collection, treatment or laboratory facility, or for facilities with a daily flow of < 1 mgd or 40 L/sec.	☐ *WE&T* (including *Operations Forum*)	
	☐ *Water Environment Laboratory Solutions*	
	☐ *WEF Highlights Online* ☐ Central States Water Magazine	
☐ **STUDENT**		$ 30.00
Students enroll for a minimum of six credit hours in an accredited college or university. Must provide written documentation on school letterhead verifying status, signed by an advisor or faculty member.	☐ *WE&T* (including *Operations Forum*)	
	☐ *WEF Highlights Online* ☐ Central States Water Magazine	
☒ **CORPORATE**		$ 270.00
One person is entitled to receive member benefits. Companies engaged in the design, construction, operation or management of water quality systems. Designate one membership contact.	☐ *WE&T* (including *Operations Forum*)	
	☐ *Water Environment Research (Print)*	
	☐ *Water Environment Regulation Watch*	
	☐ *WEF Highlights Online*	
	☐ Central States Water Magazine	
Dual Member Association Memberships Please indicate additional WEF MA(s) you would like to join and include the MA's Dual Membership dues. WEF can track up to three additional associations.	MA 1 MA 2 MA 3	$ $ $

Additional Subscriptions

Consider including additional WEF resources in your membership package! Check the appropriate subscription and include the subscription cost in your payment. NOTE: Prices listed reflect a substantial member discount!	☐ *WE&T* (including *Operations Forum*)	$55.00	$
	☐ *Water Environment Research (Online) (Call for print pricing details)*	$75.00	$
	☐ *Water Environment Laboratory Solutions*	$50.00	$
	☐ *Water Environment Regulation Watch*	$50.00	$
	☐ *Industrial Wastewater Technical Bulletin*	$89.00	$
	☐ *Biosolids Technical Bulletin*	$89.00	$
	☐ *Watershed & Wet Weather Technical Bulletin*	$89.00	$
	☐ *Utility Executive*	$89.00	$

Payment

☐ **Check/Money Order enclosed**	☐ **Charge**	**Credit Card Number**	TOTAL DUE	$
(Made payable to WEF in US funds)	☐ VISA	Exp. Date		
	☐ American Express	Signature		
	☐ MasterCard	Daytime Phone		

Mailing Information

Send Form & Payment to: Water Environment Federation • Member Service Center • PO Box 18044, Merrifield, VA 22118-0045
For more information, call 1-800-666-0206 (U.S. and Canada) or + 1-703-684-2452 (all other countries) • Fax + 1-703-684-2428 • www.wef.org

Click HERE to return to Table of Contents

www.sanitaire.com

SANITAIRE

Total Process Treatment Solutions

SANITAIRE® and ABJ are the world leaders and industry standard in wastewater treatment plants throughout the world with equipment operating in thousands of facilities. Years of dedicated and knowledgeable engineering have led to the development of our various process treatment solutions. They include in part.....

- **Fine Bubble Aeration Equipment**
  - High oxygen transfer capabilities and low operating costs
  - Proven piping and support system for long-term reliability
  - Ceramic disc and membrane disc configurations available
  - Minimal maintenance requirements

- **Sequencing Batch Reactors (SBRs)**
  - Continuous flow operation yields smaller basin volumes, equal loading between basins and allows for single basin operation
  - Enhanced biological nutrient removal with the use of pre-react selector zone
  - Low cost operations with high-efficiency SANITAIRE® fine bubble diffusers
  - Easily expandable to account for increasing future plant flows

- **MIZAIRE Oxidation Ditch**
  - Excellent effluent quality including biological nutrient removal
  - No submerged mechanical aerator devices.
  - Lower maintenance costs than comparable technologies
  - Low cost operations with high-efficiency SANITAIRE® fine bubble diffusers

- **DrumFilters**
  - Low energy consumption - power only required during backwash cycle
  - Wide range of capacity: 100 - 2,500 gpm per unit
  - All corrosion resistant components for long term reliability
  - Minimal maintenance requirements

Sanitaire
9333 N. 49th Street
Brown Deer, WI 53223
Tel: 414.365.2200
Fax: 414.365.2210
Email info@sanitaire.itt.com

Sanitaire

ITT
Engineered for life

WASTEWATER TREATMENT	BIOLOGICAL TREATMENT	TRAINING SERVICES	COMPLETE SOLUTIONS	GUARANTEED FIELD PERFORMANCE

DONOHUE

WASTEWATER ENGINEERS & TROUBLESHOOTERS

DONOHUE & ASSOCIATES

www.donohue-associates.com
1-888-736-6648

Champaign, IL • Chicago, IL • Moline, IL • St. Louis Park, MN • Willmar, MN
Madison, WI • Milwaukee, WI • Sheboygan, WI • Fort Wayne, IN • Indianapolis, IN • Chesterfield, MO

CREATIVE AWARD-WINNING SOLUTIONS