Wisconsin Wastewater Operators Association

59TH ANNUAL W.W.O.A. CONFERENCE

October 14-17, 2025
La Crosse Convention Center

AERIAL VIEW OF
LA CROSSE ISLE LA PLUME WATER TREATMENT PLANT, LA CROSSE, WISCONSIN

The Clarifier

VOL. 262 SEPTEMBER 2025

Inside This Issue...

The Clarifier is the publication of the Wisconsin Wastewater Operators' Association and is intended to inform and educate the membership on issues related to the treatment and control of wastewater. The Clarifier is produced five (5) times each year: February, April, June, September, and December. All members are encouraged to contribute to the mission of the Clarifier.

The Wisconsin Wastewater Operators' Association is a non-profit organization dedicated to educating, informing, and advancing the wastewater profession. WWOA has approximately 2,000 members divided throughout six regions: Southeast, Southern, Lake Michigan, North Central, Northwest, and West Central.

2024- 2025 W.W.O.A. OFFICIAL DIRECTORY

Marc Stephanie
President
Utilities General Manager
City of New Holstein
2110 Washington St
New Holstein WI 53061
Cell: 920-251-8100
marcstephanie@outlook.com

Joshua Voigt
Past President
Direct Sales Representative
Flygt a Xylem Brand
411 Riverview Drive
Neosho WI 53059
Work: 262-506-2343
Cell: 414-719-5567
joshua.voigt@xyleminc.com

Ben Brooks
President Elect
Superintendent
City of Wausau Waterworks
430 Adrian Street
Wausau WI 54403
Work: 715-261-6941
Cell: 715-965-2206
ben.brooks@ci.wausau.wi.us

Jenny Pagel
Vice President
Wastewater Foreman
City of Clintonville
350 E 15th Street
Clintonville WI 54929
Cell: 715-250-0623
jpagel@clintonvillewi.org

Aaron Eichhorst (2023-2025)
Director
Wastewater Treatment Leader
NEW Water
2231 N Quincy Street
Green Bay WI 54302
Work: 920-438-1007
Cell: 920-461-2424
aeichhorst@newwater.us

Katie Jo Jerzak (2023-2025)
Director
Wastewater Compliance Engineer-Wisconsin DNR
Eau Claire WI 54701
Cell: 715-313-0754
Katiejojerzak@msn.com

Nate Tillis (2024-2025)
Director
Wastewater Utility Director
Racine Wastewater Utility
800 Center St. Rm. 227
Racine WI 53403
Work: 262-636-9434
Cell: 262-822-8475
nate.tillis@cityofracine.org

Cody Schoepke (2024-2026)
Director
Superintendent
Fond du Lac WTRRF
700 Doty Street
Fond du Lac WI 54936
Cell: 920-251-9859
cschoepke@fdl.wi.gov

Kevin Berg (2024-2026)
Director
Engineering Services Dir.
Walworth County Metropolitan Sewerage District
975 W Walworth Ave
Delavan WI 53115
Cell: 262-755-9229
kberg@walcomet.com

Courtney Harris
Executive Secretary
262 W Main Street
Wales, WI 53183
Phone: 414-908-4950
customercare@wwoa.org

Clarifier Staff
Jon Butt 414-755-1149
jon.butt@meadhunt.com

Doralee Piering
262-377-6360
doralee@energenecs.com

Presidents Message: Reflecting on a remarkable journey

I would like to start off by saying that to serve on the WWOA board of directors, first as a director, then an officer, and finally the organization's President, has always been rewarding, challenging, and above all, an honor. It has been said by virtually all my predecessors that the year as president flies by, and now that I find myself at the end of that year, I wholeheartedly agree with them. Time really does seem to pass you by when you truly enjoy what you are doing and who you get to work with along the way.

This final message of my term allows me one final opportunity to encourage our members to get involved and stay involved. Run for regional office or state board. Help young operators become members themselves. Push your home utilities to take advantage of the youth apprenticeship program. Any of these will help move this organization and our profession forward in a positive way.

As I write this, there are less than two months left before the annual conference. Following are some of the highlights that will be offered at this year's event, including something new that the board and I feel will be an excellent addition to our educational lineup. Everything kicks off Tuesday morning with the annual golf outing, sporting clays, and bike ride. On the education side, we have the pre-conference workshop, and new this year, two sessions of DNR operator certification exams. You can have some fun and pass a test. For those looking to visit with old friends or to make new ones, we close out Tuesday with the annual meet and greet.

Wednesday morning gets going early with our keynote speaker, John McHugh, Vice President of External Affairs of Kwik Trip inc. Following keynote, the exhibit hall and technical sessions will open. Between Wednesday and Thursday there are over forty excellent tech talks being offered- something for every operator. The final and major event of the day is the always entertaining Operators Competition, located in the center of the exhibit hall during the social hour.

Thursday offers a continuation of this year's offering of wonderful talks and more time with vendors in the exhibit hall. Please try to talk with and visit as many of our vendors as you can. This group is the primary reason many of WWOA's events remain sustainable and affordable. We will close the conference with Thursday night's awards banquet and will say goodbye at Friday's farewell breakfast.

So, if you haven't already registered and booked your room for the 59th annual WWOA conference, you still have time!

Some final thoughts before my time as president ends. It has been a privilege to serve the membership, and to get to know so many operators and vendors from around the state and country. This experience has challenged me in the best of ways and has had an enormous impact on my career. For that, I will always be thankful. Finally, I want to thank those that supported me along the way, starting with

my wife and daughters, their support and understanding during these past seven years has not gone unnoticed. Next, all the individuals that I have served alongside on the board of directors. These dedicated individuals have provided guidance and an unwavering commitment to this organization. I'm proud to call them my friends. Finally, my past and current employers, for seeing the value of having someone from their utility representing not just them but the entire industry.

Thank you all and see you in La Crosse!

La Crosse Sanitary Sewer Utility Department

By Jared Greeno, Superintendent

The City of La Crosse welcomes you as host to the WWOA Annual Conference this year. As you visit our historic city, we at the Sanitary Sewer Utility Department have the privilege of treating your dirty water and maintaining the Mighty Mississippi like our forefathers have done for generations.

La Crosse was founded as a City in 1842, before Wisconsin was even a state. The first sewers in La Crosse were installed in the late 1880s and like most other collection systems of that era emptied directly into the Black and Mississippi Rivers. Being a river-centric city, local politicians recognized early on that treatment was beneficial and installed the first phase in 1936 as pumping, primary treatment, disinfection, and anaerobic digestion. The electric grid was unreliable back then, so the facility utilized biogas for power. As the City grew the facility phased in additional primary and solids handling capacity in 1958. In 1972, after the Clean Water Act, the City commissioned a major project that doubled primary treatment capacity to 44 million gallons per day (mgd) and established secondary treatment capacity to almost 30,000 pounds of BOD per day (lb BOD/d) for the total cost of $3.8 million ($30 million in today's dollars) ignoring any federal grant assistance. Smaller upgrades occurred between 1972 and 2020 to keep up with maintenance and efficiency goals.

The latest phase, a $62 million upgrade is nearing completion. Even with these project costs included, our rates remain the lowest in the state. The ability to stay in the lowest tiers of user rates is truly a testament to 85 years of stewardship. The following are the main drivers that convinced City leaders to justify the project.

- Reliability: Many of our aging vital equipment needed replacement in order to carry our reliability forward. Added tankage and processes have enhanced reliability for gaps in redundancies for key treatment areas.
- Regulatory: This primary driver lowered the phosphorus discharge limit from 1.0 mg/L to 0.1 mg/L. The limits became effective in 2025 and it is definitely

continued on page 6

The Only Choice for Stationary Sampling in both Municipal and Industrial Wastewater Applications

5800 Sequential/Composite Sampler

User-friendly controls, task accommodating features, and proven paristaltic pump, provide superior performance and volume accuracy. The all weather housing and heating/cooling systems protect your samples from the elements. The Teledyne ISCO 5800 Sampler is your answer to the rigorous demands of water monitoring.

MSW MULCAHY SHAW WATER
mulcahyshaw.com

TELEDYNE ISCO
Everywhereyoulook™

Experience the USABlueBook® Advantage

Get the Best Treatment™ from a partner who has served the industry since 1991.

- **Over 57,000 products from leading brands**
- **Fast shipping from our nationwide distribution network**
- **Unsurpassed customer service**
- **Free technical advice from industry experts**
- **Satisfaction guarantee**

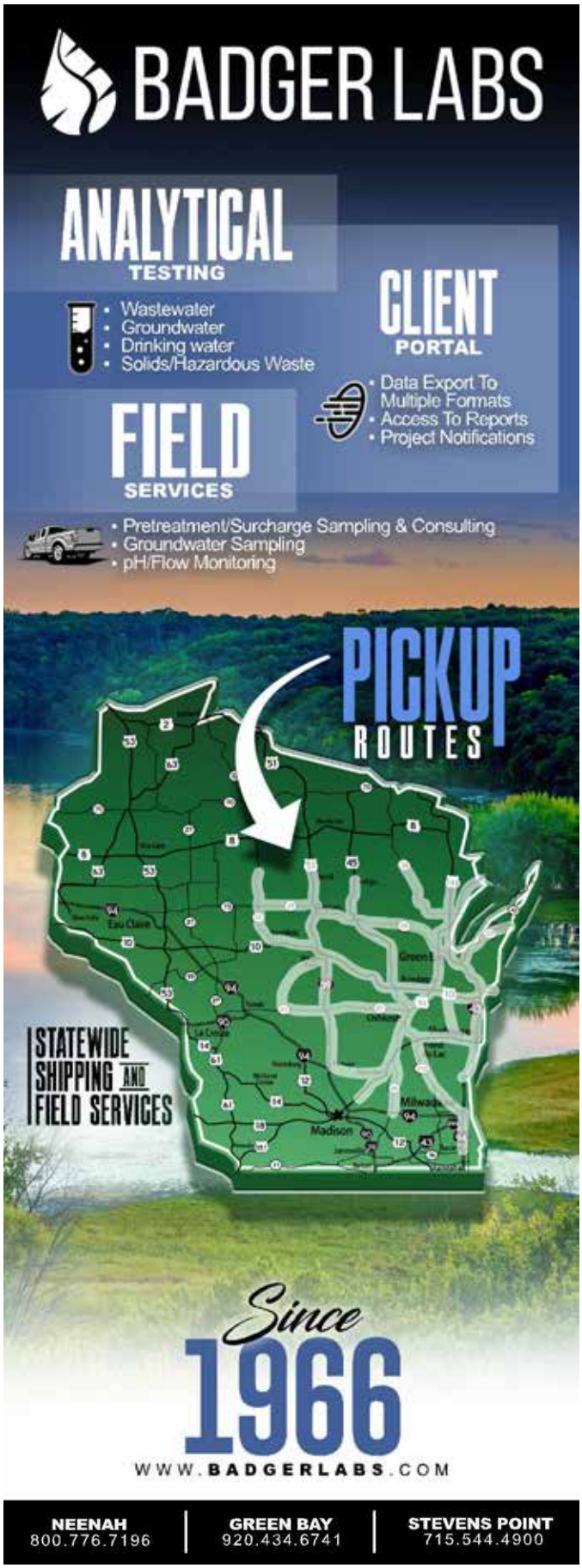
In the lab, plant and field, USABlueBook is your trusted ally in all things water and wastewater.

Request a catalog

***FREE** 1800-page catalog: usabluebook.com/C133*

800.548.1234 · usabluebook.com

USABlueBook®
GET THE BEST TREATMENT™



continued from page 4

a different arena. Thankfully, our changes to the activated sludge system have stabilized the biological removal and makes removing those last bits of phosphorus manageable.

- Efficiency: Almost 90 years after the first biogas system, this project satisfied the City's goals to reuse biogas to generate electricity. The new combined heat and power generator was activated in the fall of 2024. The staff look forward to maximizing the power offsets as a benchmark of quality service.
- Capacity: Accommodating for future growth of La Cross, it's industries, and the surrounding contract communities additional digestion and solids handling capacity was warranted. The new system is much more high-rate and adaptable for loading and regulatory issues than ever before.
- Resiliency: Lastly, the River presents a major benefit to the town, but creates vulnerability during times of flooding. Surrounded by water, there is no escaping it at times. To prevent future floods from backing up into the facility, a temporary-trailer mounted, effluent pump station was added. This system increases the City's response time to react to a rare, yet increasingly plausible weather condition.

Overview of the La Crosse Isle La Plume Wastewater Treatment Plant (August 2025)

Although the La Crosse Wastewater Treatment Plant in 2025 is now considered a modern facility, if you look closely, we have preserved relics of our history. During tours, we are proud to point out our reuse of the administration/ laboratory, primary clarifiers, and digesters from the initial 1936 build. The current facility has been well maintained

continued on page 8

ENGINEERED FOR WISCONSIN

SULZER

GLOBAL POWER.
LOCAL SUPPORT.
SULZER STRONG.

WASTEWATER PUMPS

DEWATERING PUMPS

SUBMERSIBLE MIXERS

Sulzer pumps are **now available *statewide*** through **Wisconsin Pump Works,** your trusted partner in municipal and industrial water and wastewater systems.
We offer a full range of **BABA-compliant pump solutions** backed by responsive, local support. Our products include submersible and dewatering pumps, agitators, grinders, and control systems.
From **lift station upgrades** to treatment **plant expansions** and **emergency repairs,** our experienced team is ready to support your project every step of the way.

WISCONSIN PUMP WORKS
-a UFT Company-

- World-class Sulzer products
- Emergency repair and field service
- Lift station maintenance & retrofits
- ENVIRONMENT ONE Grinder Pump Service
- 24 Hr. Emergency Services

877 645 8004
1720 Fire Lane Drive
Green Bay, WI 54311

www.wisconsinpumpworks.com
info@wisconsinpumpworks.com

continued from page 6

and efficiently operated, resulting in excellent performance, effluent quality, and staff stability.

Current treatment performance is summarized in the following table.

2024 DMR Data	Influent	Effluent	Removal
BOD			
mg/L	364	5	99%
lbs	33,700	440	
TSS			
mg/L	565	9	99%
lbs	52,256	799	
Phos			
mg/L	8.62	0.57	93%
lbs	798	53	

August 2025 After Filtration Startup			
Phos			
mg/L	8.85	0.1	99%
lbs	749	8.5	

Wastewater treatment performance data

Wastewater for the City of La Crosse properties flows to the plant through around 200 miles of separated sanitary sewers and 26 lift stations, all of which are operated and maintained by the Utility. We serve as a regional facility so in addition to flow from the properties within the City, the existing plant provides sanitary sewer treatment to the residents and businesses of our municipal partners; City of Onalaska, City of La Crescent, MN, Town of Campbell, and Town of Shelby. All told, our regional wastewater treatment plant provides service to over 90,000 people. The wastewater facility currently receives flows averaging 11 mgd. The Isle La Plume Wastewater Plant is an advanced biological nutrient removal activated sludge treatment process. The following provides a more detailed summary for those who share the same passion for wastewater as we do.

Sewers bring wastewater to Isle La Plume, an island amidst the Mississippi River. Forward flows first enter the headworks for screening. The facility has two Huber fine screens, one step screen from 2001 and a new multi-rake, both capture particles above ¼ inch. Following screening, raw pumps lift flows to a dual PISTA grit system to remove heavy solids ahead of the primary and secondary treatment processes. Screened materials and washed grit from preliminary treatment are hauled to the La Crosse County landfill.

continued on page 10

We provide professional control system integration including ***SCADA & reporting software, PLC programming, motor control & drives, instrumentation, radio & fiber communications, & UL control panels.***

All backed by an ***unmatched dedication to service.***

Energenecs

WWW.ENERGENECS.COM
800-343-6337

continued from page 8

Startup training of the new fine screen

Five primary clarifiers are currently available for service, with usual operation of only the largest two units, depending on capacity needs. The clarifiers have all been refurbished, providing industry standard removal rates that beneficially improve the efficiency of subsequent systems.

The secondary treatment process remains the overall dimensions from 1972, but has been retrofit multiple times. In the 1980s, the system was upgraded from coarse bubble aeration to fine bubble. In the early 1990s, staff collaborated with Dr. Cliff Randall to pilot and convert reactors to the A2O process to engage biological phosphorus removal. The BNR system was well performing but utilized 50% of the volume as unaerated reactors. This forced the City to hold excessive sludge ages for nitrification and created long SRT filament problems. Donohue was able to show through process modeling that by converting to a modified University of Cape Town process, the City could improve nitrification with fewer solids because the selector fraction only required 33% unaerated volume.

The City was an early adopter of high-speed turbo blowers for energy efficient aeration, these units were replaced in 2023 for APG-Neuros units. Combined with an improved airflow distribution system, the new system operates very stable and efficient.

Four organ-pipe final clarifiers are available, with one unit normally offline due to excess capacity. Like the primary tanks, all secondary clarifiers have been fully rehabilitated. Fiberglass launder covers were added to prevent algae growth from impacting the phosphorus removal system performance.

continued on page 12

B&M TECHNICAL SERVICE, INC.
LEADERS IN SERVICE & SOLUTIONS

GET YOUR DUCKS IN A ROW

CONTROLS | PUMPS | INSTRUMENTATION

CALL 715.228.7604
VISIT BMTECHSERVICE.COM

DORNER
Since 1911
Water | Wastewater | Industrial Sales & Service

&

HERON INNOVATORS
The Clear Advantage

SAF

FLOTATION WITHOUT DISSOLVED AIR

PRIMARY/SECONDARY TREATMENT

Fully Integrated Systems from 25 to 8,000 GPM

SAF® CONVERSIONS

Easily Convert DAF to SAF® w/ SAF® generator & inline mixer

CF125 Fully integrated, skid-mounted system engineered to customer specifications.

- F25 SAF® Generator
- 350 GPM (>.5M GPD)
- Adjustable Weir
- Chemical Staging
- Polymixing System
- Serpentine-Style Floc Mixer
- 8 feet x 20 feet
- Up & Running In Less Than A Day
- Simple to Operate / Easy Startup

Learn More
See SAF® in Action!

If you'd like more information on the SAF® process, please reach out to our representatives at Dorner:

N61W23043 Silver Spring Drive PO Box 189 Sussex, WI 53089-0189
Phone: (262) 932-2100 **Fax:** (262) 932-2101 **E-mail:** sales@dornerco.com **Web:** www.dornerco.com

continued from page 10

Rehabilitated final clarifiers with the biosolids storage silo and biogas membrane sphere in the background

The secondary effluent is intercepted on route to disinfection for a new polishing filter to remove additional phosphorus. In a rapid mix zone, ferric chloride is allowed to react with soluble phosphorus and generate particulate phosphorus in a coagulation zone. Following, the addition of polymer a flocculation zone grows the size of particles. Lastly, a series of Veolia disk filters physically separate the particles from the effluent leaving behind high-quality water.

Tertiary disk filters for low level phosphorus compliance

Seasonal disinfection is provided with ultraviolet (UV) light. The City made this shift in 1991 and has enjoyed it since. The current system has three, horizontal Wedeco banks which rotate getting new bulbs every year.

UV bulbs stored out of channel during winter

After removing every last bit of phosphorus from the liquid train, the only way for phosphorus to leave the system is through the solids train. Thin primary and secondary sludges are comingled in a gravity thickener. This provides redundant pre-thickening prior to mechanical processing and helps elutriate soluble

continued on page 14

If it involves water, MSA has the expertise to address it.

MSA applies a holistic approach to wastewater treatment.
Our experts place utmost importance on the implementation of cost-effective solutions that are operator friendly and sensitive to long-term operational costs.

We work with you to plan, design and implement a water reclamation solution that achieves compliance today and will maintain compliance tomorrow as your community grows.

Start a relationship with us today.
(800) 362-4505

MSA
www.msa-ps.com

AQUASTORE®

WHAT'S INSIDE MATTERS

DON'T SETTLE FOR LESS THAN THE BEST

SPECIFY VITRIUM™ PREMIUM TiO_2 TECHNOLOGY

The interior of ALL Aquastore® tanks feature proprietary Vitrium™ coating technology enhanced with titanium dioxide for the toughest glass available.

GET THE QUALITY YOU DESERVE

- Tough TiO_2 glass formulation provides longer life
- White interior is easier to inspect than darker coatings
- Electrostatically applied base coat application ensures consistent quality
- Factory certified "holiday-free" sheets
- Designed for use in both cold and hot climates
- Designed, fabricated, shipped and supported within the USA

CADY AQUASTORE INC.

GREAT PLAINS STRUCTURES

Cady Aquastore | 815-438-5678
cadyaquastore.com

Great Plains Structures | 651-484-0111
greatplainsstructures.com

2021, Cady Aquastore Inc and Great Plains Structures. AQUASTORE® is a registered trademark and Vitrium is a trademark of CST Industries Inc.

continued from page 12

phosphorus to prevent struvite. A sludge screen removes debris from primary sludge to minimize downstream ragging and extracts plastic contaminants.

Gravity thickener underflow is pumped to mechanical thickening. After piloting, the City selected Orege SLG-F, which uses compressed air to cavitate the incoming sludge and rebuild a tighter floc with polymer allowing for thickening to 9% TS entering digestion without compromising mixing. Removing excess water through digestion was necessary to increase the organic capacity of the facility.

The City has four mesophilic anaerobic digesters to stabilize sludge, inclusive of the original (refurbished) 1936 digesters. The sludge is mixed using a pump and nozzle recirculation loop. The contents are heated to 98°F using Walker tube-in-tube heat exchangers connected to the low temperature hot water loop fed from dual fuel boilers. Biogas is captured with floating covers and diverted to a storage membrane. Whenever possible, biogas is treated for hydrogen sulfide and siloxanes and burned in a Kraft Power Guascor 676kW (36 liter displacement) combined heat and power reciprocating engine. As the name implies, the engine's waste heat (jacket water and exhaust gas) is captured for reuse onsite.

CHP engine generator and heat recovery piping

High strength waste is imported from local industries to alleviate influent loadings and efficiently stabilize solids while enhancing biogas production. Currently, these loads

continued on page 15

FLOW OPTIMIZATION SECOND TO NONE

BÖRGER®
EXCELLENCE – MADE TO LAST

Boerger's BLUEline Rotary Lobe Pumps are low maintenance and high performance for wastewater treatment plants.

+ Flows up to 7,000 gpm
+ Low Shear Handling
+ Reversible Operation
+ Dry Running Capability
+ Solids Handling
+ MIP (Maintenance In Place)

www.boerger.com

Municipal Representative:

MSW MULCAHY SHAW WATER

Contact: Rich Knoelke
P 262.241.1199
E info@mulcahyshaw.com
W www.mulcahyshaw.com

continued from page 14

have been predominantly brewery related, but the City has interest from cheese plants and grease trap haulers.

After anaerobic digestion, the Class B biosolids can be discharged directly as liquid or processed further. For many years the City land applied thickened liquid biosolids twice a year. This bi-annual event involved 1,000 truckloads of sludge, which requires careful orchestration to ensure all sludge makes it out of the tank timely. A BDP belt filter press is available to create Class B cake biosolids if necessary.

To enhance the City's reliability for biosolids disposal, a Huber belt dryer was constructed and initiated operation in 2024. The dryer utilizes energy from the medium temperature heat loop to operate at over 270°F evaporating water generating solids that are over 90% total solids and qualify for Class A fertilizer. For now, the City's past agricultural recipients have agreed to receive the Class A product. Looking forward, the local biomass burning facility has trialed a load of dried biosolids and expressed interest in partnering with the City if PFAS and other emerging contaminants prevent land application.

The wastewater plant utilizes an extensive SCADA for automated operation of much of the facility and collection system. Some of the more interesting instrumentation features include:
- Real-time, in-line analytics for effluent ortho-P, suspended solids, and ammonia with alarm settings to alert when

Real-time phosphorus and nitrogen analyzer

continued on page 16

continued from page 15

results are outside of normal parameters, which helps signal process upsets and initiate manual intervention
- Real-time, in-line analytics to analyze ortho-P in the primary effluent and BNR zones to trend the health of the biological system
- Real-time, in-line sensors to monitor mixed liquor and return activated sludge to establish a current system SRT, which is then contrasted against the lab reports.

The wastewater plant utilizes its onsite, certified lab to complete much of the analytical work required for DMR reporting, as well as operational process testing.

The real magic behind wastewater treatment are the people. Staffing at La Crosse's sanitary sewer utility totals 27 people, including the supervisory and support functions staff. The team undertakes, responds to, and tackles all challenges head-on. During construction, our hands found ways to enhance the design without fuss. We have been fortunate to add staff to champion the disk filter and sludge drying components. Our people have a diverse background, but experience starts with mechanical and maintenance skills and a technical ability to simply figure-it-out.

Members of the sanitary sewer utility celebrating after winning a recent ugly Christmas sweater contest

Our facility has performed well over time and continues to improve as we learn and optimize the new processes. It is only a matter of time before the next change hits our permit, but for now we look forward to some consistency.

Prior to our upgrade, our team participated in the WWOA Ops to Ops tours and has gained knowledge and network connections that have already proven useful multiple times. We look forward to continuing to share our system. If you haven't received a tour, join us when you can.

Ask the Engineer/Operator!

Have a question you'd like to ask an engineer or an operator?

Just email it to:
AskTheClarifier@wwoa.org

Innovation – share your ideas with others!

How do you replace a valve on a biogas line that has failed? Thanks to an operator, we know you could inject shaving cream upstream from the valve to hold back the biogas until the valve can be replaced. This innovative idea came from Beloit.

I bet every operator has that one innovative idea that he or she uses almost everyday. Operators are some of the smartest and most innovative people I know. Maybe it is something you do to help with the treatment process. Maybe it is something you do to make maintenance easier. No matter what it is, your fellow operators want to hear your ideas. Maybe something you do might help someone else.

Here what I want you to do – email me your idea. Or you can call. I'll draft a short article on your behalf about your idea. You approve the article, and we'll include it in an issue of the Clarifier. What could be easier?

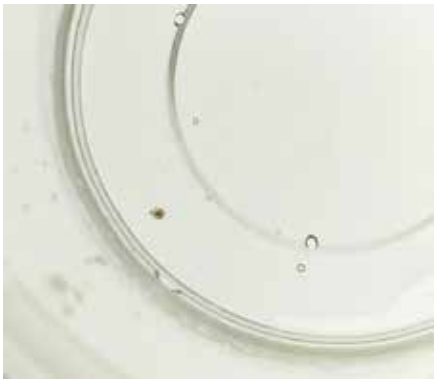
Jon Butt, Clarifier Editor c/o Mead & Hunt
6737 W. Washington St., Suite 3500
Milwaukee, WI 53214 414-755-1149
Jon.butt@meadhunt.com

Whole effluent toxicity (WET) testing

By Patrick Poirier, Environmental Consulting & Testing Inc.

Whole Effluent Toxicity (WET) testing is a laboratory method used to identify potential toxins entering aquatic ecosystems through wastewater discharges. Conducted by accredited laboratories, WET testing plays a vital role in determining whether a facility's effluent poses ecological risks. These tests are routinely required by the U.S. Environmental Protection Agency (EPA) and state agencies under the National Pollutant Discharge Elimination System (NPDES or WPDES for Wisconsin) permit program.

In a typical WET test, aquatic organisms such as fathead minnows (Pimephales promelas), water fleas (Ceriodaphnia dubia), and green algae (Raphidocelis subcapitata, formerly Selenastrum capricornutum) are exposed to varying concentrations of wastewater effluent, usually in a dilution series. These exposures allow scientists to observe biological responses and determine whether the effluent produces harmful effects when compared to clean control water.



CD 1 adult

FHM 1 adult

There are two main types of WET tests: acute and chronic. Acute tests measure immediate, short-term effects, specifically mortality, over a 48- to 96-hour period. Chronic tests last up to seven days and assess longer-term impacts, such as reduced growth (fathead minnow) or reproduction (c.dubia). The results of both test types are statistically analyzed to determine whether the organisms exposed to the effluent exhibit significant adverse effects when compared to those in the control group.

The presence of harmful pollutants in the effluent is a primary reason for failed WET tests. Substances such as ammonia, chlorine, heavy metals, and various organic compounds can be toxic to aquatic organisms. Ammonia is commonly present in domestic wastewater, particularly when nitrification processes are incomplete. Chlorine, often used as a disinfectant, is extremely toxic to aquatic life even in very low concentrations. De-chlorination can also be toxic. Heavy metals like copper, zinc, and lead frequently enter effluent streams as a result of industrial processes or corrosion of infrastructure. Additionally, organic compounds, including industrial solvents, surfactants, and other complex chemicals, may also contribute to toxicity.

FHM 2 tile with egg

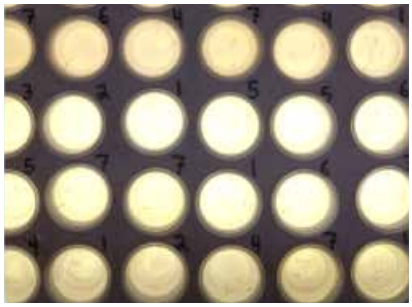
When present together, even at low concentrations, these pollutants can interact in unpredictable ways, occasionally creating a more toxic mixture than any single component alone.

FHM 3 24 hr

However, toxicity is not always the result of chemical pollutants alone. The physical and chemical characteristics of the effluent itself can impact test results. High salinity, extreme pH levels, low dissolved oxygen, excessive turbidity, or the presence of suspended solids can stress the test organisms independently of any actual toxins. These factors can influence the outcome of the test and, in some cases, mask or exaggerate underlying toxicity.

The way in which the sample is collected, handled, and stored also plays a critical role in test accuracy. If there are delays in sample transport, improper storage temperatures, or contamination during sampling, the sample's chemical profile can change, leading to misleading results. Any deviation from the EPA's approved testing protocols can compromise the validity of the test.

continued from page 18



Test board

Since WET testing involves live organisms, biological variability must also be accounted for. Differences in organism health, age, or sensitivity can affect how they respond to the effluent. Environmental conditions within the laboratory such as lighting, temperature, and dissolved oxygen can also introduce variation. To reduce these sources of variability, laboratories are required to follow strict quality control procedures, including routine sensitivity checks and consistent environmental monitoring.

To conclude, Whole Effluent Toxicity testing is a powerful and comprehensive method for detecting harmful effects of wastewater discharges on aquatic life. While a failed test often indicates the presence of toxicity, the underlying causes are not always straightforward. A wide range of factors, including chemical composition, sample handling, and testing conditions, must be considered. When a test fails, further investigations such as toxicity identification evaluations (TIEs) are typically conducted to determine the source of the toxicity and guide appropriate corrective actions.

By understanding the scientific principles behind WET testing and the many factors that can influence the results, facilities and regulators can work more effectively to protect aquatic ecosystems and ensure environmental compliance.

Patrick Poirier is the owner of Environmental Consulting & Testing Inc. (ECT), located in Superior, WI. ECT is a laboratory that specializes in Acute and Chronic WET testing, Toxicity Identification Evaluations (TIE), Toxicity Reduction Evaluations (TRE), Sediment and Bioaccumulation testing, chemical testing, site-specific investigation and consulting for industry and municipalities.

Clarifier
December Issue Deadline
November 15

continued on page 19

Like water itself, innovation flows through every challenge and shapes new possibilities. For over 90 years, Carollo has pioneered breakthroughs in water technology – from resilient infrastructure protecting growing communities to groundbreaking solutions safeguarding public health and ecosystems. At Carollo, innovation isn't just about what's new – it's about what's necessary. Every advancement, every improvement, and every solution flows from a single purpose: shaping a future where water enriches every community it touches.

carollo®

800.523.5826 / carollo.com

Wisconsin Wastewater Operators Association

59th Annual Conference

Dear WWOA Conference Attendees,

The WWOA Board of Directors cordially invites you to the 59th Annual WWOA Conference, October 14 through October 17, 2025. This year's conference will be held at the La Crosse Center on the shores of the Mississippi River. The WWOA board has been hard at work putting together another great program of networking and learning opportunities. We look forward to seeing you there.

Tuesday, October 14th: Kick off your conference experience with a variety of fun and informative activities to choose from:

- One Pre-Conference Workshop: Lab Quality Control: Past, Present, and Future, presented by Rick Mealy
- Two Scheduled sessions for water and wastewater operators to take the WI DNR Operator Certification Exams
- The Annual Golf Outing, Sporting Clays Event, and Cassic Bicycle Ride
- The Annual Meet and Greet with food and beverage.

Wednesday, October 15th: Annual Conference Commences

- Welcome Address by WWOA President, Marc Stephanie, followed by Keynote Speaker, John Mc Hugh, Vice President of External Affairs, Kwik Trip Inc.
- Conference Introduction by Andrew Iverson, State Director of USDA Rural Development
- Conference Exhibit Area will be open from 9:45 am to 5:00 pm — Your opportunity to meet the many vendors and sponsors who support our industry and our conference!
- Technical Sessions with four different tracks to choose from, scheduled from 10:30 am - 3:10 pm.
- Operators' Competition: Located in the center of the Exhibition Center from 3:15 pm until 5:15 pm.

- Exhibitors Social Hour: Grab a beverage and watch your favorite Operators compete for first place. Located in the center of the Exhibition Center from 3:15 pm to 5:15 pm.

Thursday, October 16th: Continuation of the Conference

- Technical Sessions: Four different tracks are offered from 8:00 am to 9:45 am and three tracks from 1:35 pm to 3:45 pm.
- Plant tour of the La Crosse Facility from 1:35 to 3:45 (signup required – Maximum of 90 participants)
- Exhibitor Area: Open from 8:00 am - 11: 45 am.
- Annual Operators' Lunch and Business Meeting: Lunch from 12:00 pm - 12:30 pm, Business Meeting from 12:30 to 1:30 pm
- Social Hour from 6:00 pm - 7:00 pm followed by the Annual Awards Banquet and celebration beginning at 7:00 pm. Entertainment will commence immediately following the banquet which will be the Annual Bean Bag Toss Tournament.

Friday, October 17th: Farewell Breakfast and Farewell Speakers, 8:00 – 10:30 am

- Greetings from WWOA President Ben Brooks
- Farewell speakers Ezra Meyer – DNR, Ben Propson – Village of Kewaskum, Jeremy Cramer – City of Sun Prairie, Joe Kottwitz – Focus on Energy, and Kate Beardmore – DHS will discuss Building your Utility's Resilience against the impacts of Climate Change

PRE-REGISTRATION FOR THE ANNUAL WWOA CONFERENCE IS STRONGLY ENCOURAGED!

Online registration available at www.wwoa.org.

On behalf of the WWOA Board of Directors, the Technical Program Committee, the Exhibits, Manufacturers & Consultants Committee, Local Arrangements Committee, and everyone that has worked to bring this 59th Annual Conference together, we look forward to welcoming you to La Crosse in October!

SCHEDULE AT A GLANCE

Tuesday, October 14, 2025

9:00 a.m. – 12:00 p.m.	Operator Certification Exam North Hall D
10:00 a.m. Shotgun Start	Golf: Fox Hollow Golf Course
10:00 a.m. Shotgun Start	Sporting Clays
10:00 a.m.	Bike Ride
1:00 p.m. - 4:00 p.m.	Pre-Conference Workshop: North Hall A
1:00 p.m. - 4:00 p.m.	Operator Certification Exam North Hall D
2:00 p.m. – 4:00 p.m.	Registration Badge Pickup Only at Registration
4:30 p.m. - 6:00 p.m.	Regional Officers Meeting: South Boardroom B
6:00 p.m. - 9:00 p.m.	Meet & Greet (beer, wine, soda, cash bar): Outside of the South Ballroom (3rd floor)

Wednesday, October 15

7:00 a.m. - 5:30 p.m.	Registration Open: Pre-Function Area (Scanning In and Out)
8:30 a.m. - 8:45 a.m.	Welcome Address: Upper South Ballrooms A/B/C WWOA President, Marc Stephanie
8:45 a.m. – 9:30 a.m.	Keynote Address, John McHugh South Ballrooms A/B/C
9:30 a.m. – 9:45 a.m.	Conference Introduction, Andrew Iverson South Ballrooms A/B/C
9:45 a.m. - 5:00 p.m.	Exhibitor Expo: Exhibition Center
10:30 a.m. - 11:55 p.m.	Technical Sessions: North Hall A/B/C/D
12:00 p.m. - 1:00 p.m.	Walk Around Lunch: Exhibition Area
1:00 p.m. - 3:10 p.m.	Technical Sessions: North Hall A/B/C/D
3:15 p.m. - 5:15 p.m.	Operators Competition: Center of Exhibition Area
3:15 p.m. - 5:15 p.m.	Exhibitors Social Hour: Exhibition Center
8:00 p.m.-11:00 p.m.	Social Event: Offsite

Thursday, October 16

7:00 a.m. - 4:30 p.m.	Registration Opens: Pre-Function Area (Scanning In and Out)
8:00 a.m.- 11:45 a.m.	Exhibitor Expo: Exhibition Center
8:00 a.m. - 11:45 a.m.	Technical Sessions: North Hall A/B/C/D
12:00 p.m. - 12:30 p.m.	Operators' Luncheon: South Ballroom
12:30 p.m. - 1:30 p.m.	Business Meeting: South Ballroom
1:45 p.m. – 3:45 p.m.	Plant Tour
1:45 p.m. - 3:45 p.m.	Technical Sessions: South Ballroom
6:00 p.m. - 7:00 p.m.	Social Hour: South Ballroom Hallway
7:00 p.m. - 11:00 p.m.	Awards Banquet / Entertainment: South Ballroom

Friday, October 17

7:30 a.m. – 11:00 a.m.	Greeting: Ben Brooks, WWOA President Registration: Pre-Function Area (Scanning In and Out)
8:00 a.m. - 10:30 a.m.	Farewell Breakfast: Radisson Hotel Ballroom

Wisconsin Wastewater Operators' Association
59th Annual Conference

TUESDAY, OCTOBER 14, 2025 3.0 CECs Available

Pre-Conference Workshop / OP CERT Exams

Moderator	*Rick Mealy*	*Katie Jo Jerzak*
9:00 am to 12:00 pm		OP CERT Exam Session 1 WI DNR
1:00 pm to 4:00 pm	Lab Quality Control: Past, Present, and Future Rick Mealy, Retirement Doesn't Suck, LLC.	OP CERT Exam Session 2 WI DNR

4:30 – 6:00 pm Regional Officers Meeting located South Boardroom B

6:00 - 9:00 pm Meet & Greet: located South Ballroom C

Wisconsin Wastewater Operators Association
59th Annual Conference

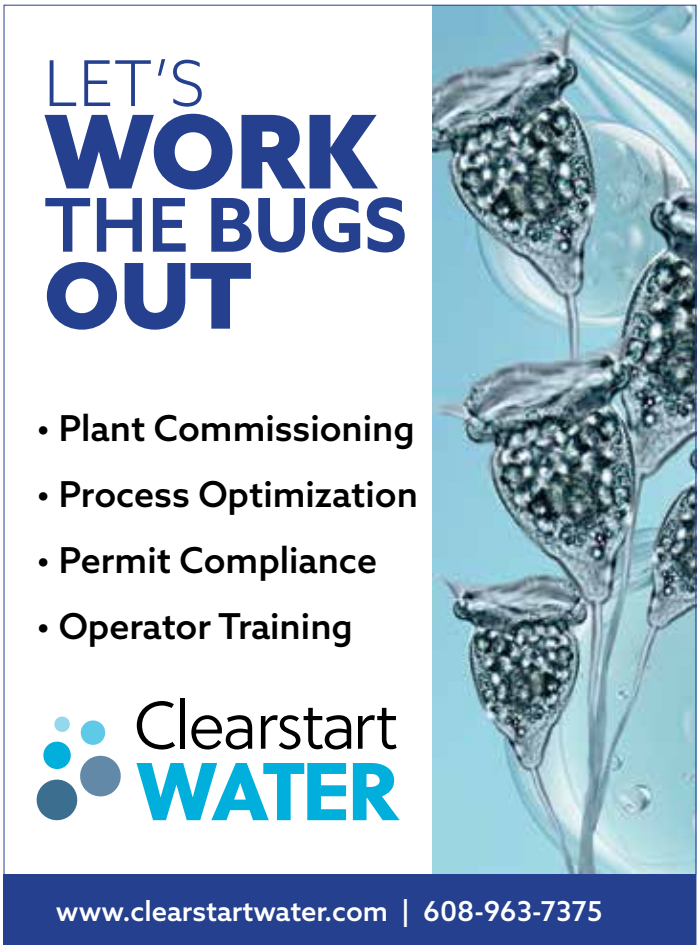
North Hall A: Purple | North Hall B: Green | **Technical Program Schedule** | North Hall C: Orange | North Hall D: Blue

WEDNESDAY, OCTOBER 15, 2025 5.5 CECs available				
La Crosse Center South Ballroom				
8:30 to 8:45 am	**Welcome Address by Marc Stephanie, WWOA President**			
8:45 to 9:30 am	**Keynote Speaker: John McHugh, Vice President of External Affairs, Kwik Trip Inc.**			
9:30-9:45 am	**Conference Introduction: Andrew Iverson, State Director, USDA Rural Development**			
Visit the Exhibit Hall – 9:45 am - 5:00 pm				
	Session A Primary Treatment	Session B Resiliency	Session C SCADA	Session D Water Quality
Moderator:	*Kevin Berg*	*Neal Kolb*	*Diane Thoune*	*Katie Jo Jerzak*
10:30 to 11:10 am	Evaluating Thickening Technologies to Enable Enhanced Primary Treatment Ethan Yen - Black & Veatch	Powering Through the Storm Dave Gohdes, Troy Larson, Travis Anderson - Strand Associates	Going Paperless: Leveraging GIS and WIMS Scott Kiley, Jason Terry - MSA Professional Services	Water Quality Trading Roadmap – Case Study Reviews from Planning to Reality MacKenzie Phillips, Matt Castillo – MSA professional Services
11:15 to 11:55 am	Advancements in Primary Treatment: Moving Beyond Clarification Robert Wiley - Nuove Energie USA, Inc	What Happened to My Pump? Randy Langer, Ryan Yentz - Strand Associates	Key Considerations of SCADA design Lance Eric Teunissen – MSA Professional Services	Planning for Growth and Cleaner Waters in Watertown Leo Kucek – Applied Technologies, Peter Hartz – City of Watertown
12:00 to 1:00 pm	**Walk Around Lunch in the Exhibition Area of South Hall A**			
	Session E ***Phosphorus Upgrades***	Session F PFAS	Session G Collection Systems	Session H Lab
Moderator:	*Brian Helminger*	*Ben Brooks*	*Jake Guth*	*Rick Mealy*
1:00 to 1:40 pm	Low Level Phosphorus Filters – Finer Points of Design and Operation David W. Amott – Ruekert & Mielke	PFAS Treatment 101: Everything you wanted to know and more you didn't Tonya Chandler - BioLargo	City of Elkhorn: A Programmatic Approach to I&I Reduction Dob Doeringsfeld – Applied Technologies, Matt Lindstrom – City of Elkhorn	Detecting Falsification and Data Fraud Rick Mealy – Retirement Doesn't Suck, LLC
1:45 to 2:25 pm	Heart of the Valley Effluent Filtration Christine Schlimgen - Donohue & Associates	Biosolids Planning for Potential Impacts of PFAS Ryan Yentz, Jonessa Ruhl – Strand Associates	How Operators Prioritize Lift Station Upgrades Brad Wendtland – City of Wausau, Diane Thoune – Clark Dietz	Stuff Happens. Don't Cover it up, Write it up! Zana Sijan, Matthew Stowe, Tom Trainor – WI DNR
2:30 to 3:10 pm	Facility Improvements Adapt Existing Site to New Treatment Limits Randy Langer, Evan Hunsanger – Strand Associates	Transforming Sludge: Supercritical Water Oxidation (SCWO) for a PFAS Free Future David Garb – 374 Water	Waterford Sanitary District – 20 Station Upgrade Project Ethan Botmen – Ruekert-Mielke	Ask the Auditor: Bring us Your Laboratory & Audit Questions Brenda Anderson, Matthew Stowe, Patty Doerflinger – WI DNR
3:15 to 5:15 pm	**Operators Competition in the center of the Exhibit Hall**			
	Exhibitors Social Hour in the center of the Exhibit Hall			

North Hall A: Purple	North Hall B: Green	**Technical Program Schedule**	North Hall C: Orange	North Hall D: Blue

THURSDAY, OCTOBER 16, 2025 7.3 CECs available				
Visit the Exhibit Hall – 8:00am – 11:45 am – Exhibit Hall				
	Session I Organizational	Session J Biosolids	Session K Lagoons	Session L Process Control
Moderator:	*Josh Voigt*	*Sam Maroszek*	*Cody Schoepke*	*Jesse Valukas*
8:00 to 8:40 am	Building a Better Board Kay Marie Curtin – Curtin Consulting and Training, LLC	D.O.G.E Biosolids Jared Greeno – City of La Crosse, Eric Lynne Donohue and Associates	Dialing it all in: BOD, NH3, and TP Optimization at an Aerated Lagoon WWTF Kyra Cassidy, Jacob Novitch – MSA Professional Services	Routine Biological Monitoring and Predicting System Upsets Saylor Gilbert Aquafix
8:45 to 9:25 am	MDV 2.0: What Communities Need to Consider Nora Rickman – MSA Professional Services, Peter Petersen – City of Pittsville	A Comprehensive Look at NEW Water's Utilization of High Strength Waste and What They Have Learned Jake Becken, Corbin Magnin – NEW Water/GBMSD	Chemical Phosphorus Removal in Lagoons – Successes and Lessons Learned Pat Morrow - MSA	Planning and Implementation of Low-Level Phosphorus Treatment Troy Larson, Travis Anderson – Strand Associates
9:30 to 10:15 am	**Break in the Exhibit Area**			
	Session M ***Nutrient Control***	Session N Activated Sludge	Session O ***Funding***	
Moderator:	*Jon Milheiser*	*Jamey Burns*	*Nate Tillis*	
10:20 to 11:00 am	Energy and Operational Efficiency Through Ammonia Based Aeration Control Jeremiah Wendt – SEH, Alex Zenner – City of Medford	Unique Approach to Inline Fermentation Stabilizes Biological Phosphorus Removal John Koch – EnviroMix	Preparing for & Navigating a Clean Water Fund Application Brea Grace, Henry Elling – Short Elliot Hendrickson (SEH)	PLEASE VISIT THE EXHIBIT AREA
11:05 to 11:45 am	Low DO Operation for Biological Nutrient Removal at Green Bay: One Year Later Gretchen Gutenberger – Black & Veatch, Sarah Elger - EnviroMix	Internal Substrate Selection of Granules in a Flow Through Activated Sludge System via Biological Selectors Bill Marten, Kam Law – Donohue & Associates	Blended Project Funding – High Effort, High Reward Lisa Twarog – Town & Country Engineering	
12:00 pm	**Operator's Luncheon in the South Ballroom**			
12:30 pm	**WWOA Business Meeting**			
1:45 to 4:00 pm	**Plant Tour (Sign up at Registration Required)**			
	Session Q Adaptive Management	Session R Ingenuity	Session S Upgrades	
Moderator:	*Jake Becken*	*Troy Larson*	*Jeff Dempsey*	
1:40 to 2:15 pm	Five Years of Adaptive Management: The Grafton Experience Jonathan Butt – Mead & Hunt, Brecken Gries – Grafton WWTP	Tricks of the Trade 2025 Troy Larson – Strand Associates	Start from Scratch: Construction through Startup for a 0.35 MGD Greenfield Municipal Facility Natalie Cook, Greg Markle – Donohue & Associates	
2:20 to 3:00 pm	Alternative Compliance Adaptive Management: Progress and Lessons Learned Erin Houghton – NEW Water	Tales From the Road Tony Roche, Jesse Hass – Wisconsin Rural Water Association	Designing Around Uncertainty: Considerations for Small Plants and Industrial Flows Tom Foley – Clark Dietz	PLEASE VISIT THE EXHIBIT AREA
3:05 to 3:45 pm	Fireworks' Impacts on In-Stream Phosphorus Thomas Steinbach, Eric Joost – OWPP City of Oconomowoc	Facility Maintenance Doug Sabel – Sabel Mechanical	Let There Be Light! Constructing a Multi-Phase UV Disinfection Replacement on Lake Michigan Nicole Heyniger, Lindsey Busch – Carollo Engineers	
6:00 pm	**Social Hour**			
7:00 pm	**Awards Banquet in the South Ballroom ABC**			
9:00 pm (approx.)	**Post Awards Banquet Entertainment (Bean Bag Toss Tournament for Cash)**			
FRIDAY, OCTOBER 17, 2025 2.0 CEC's available				
8:00 to 10:30 am	**Operator's Farewell Breakfast in the Radisson Hotel Ballroom** **Moderator: Ben Brooks, WWOA President** **Farewell Presentation: Building your Utility's Resilience Against the Present and Future Impacts of Climate Change** **Ezra Meyer – DNR, Ben Propson – Kewaskum Wastewater Utility, Jeremy Cramer – City of Sun Prairie Wastewater Department, Joe Kottwitz – Focus on Energy, and Kate Beardmore - DHS**			
Conclusion of Conference				

WEDNESDAY, OCTOBER 15, 2025				
In-Booth Talks - 10:00 am - 3:00 pm – Exhibitor Hall				
Refer to on-site booth map for vendor locations				
Time:	*10:00 - 10:15 am*	*10:20 - 10:35 am*	*10:40 - 10:55 am*	*11:00 - 11:15 am*
Speaker:	Wisconsin Pump Works Bailey Mueller	AgSource Laboratories Meredith Polar	10X Business Broker Mergers & Acquisitions Katherine Ramirez	USALCO Joe Shepley
Time:	*11:20 - 11:35 am*	*11:40 - 11:55 am*	*1:00 - 1:15pm*	*1:20 - 1:35 pm*
Speaker:	M.E. Simpson Joe Nepras		Mac Queen Brian Walder	Baxter & Woodman Jennifer Barlas
Time:	*1:40 - 1:55 pm*	*2:00 - 2:15 pm*	*2:20 - 2:35 pm*	*2:40 - 2:55 pm*
Speaker:	Wisconsin Pump Works Scott Swenson	Concentric Integration Randal Olson	William Reid Emily Nurmi	



WISCONSIN WASTEWATER OPERATORS ASSOCIATION

WWOA 59th Annual Conference

La Crosse Center, La Crosse, WI
October 14-17, 2025

CONFERENCE SPECIAL EVENTS SPONSORSHIP

Company Name:_____

(As you would like it to appear on printed materials)

Contact Name:_____

Type of Business/Product or Service Offered:_____

Address:_____

City, State, Zip Code:_____

Phone:_____ Fax:_____

E-mail:_____

All sponsors will have their company names included on the following: Banners/Posters at the conference, on our website (wwoa.org), and in our Clarifier magazine. Please send them to c.harris@wwoa.org.

☐ We wish to sponsor the Golf Outing ($100/Hole)	Amount $ _____
☐ We wish to sponsor the Sporting Clays ($50/Station)	Amount $ _____
☐ We wish to be a major sponsor of the Sporting Clays ($100+)	Amount $ _____
☐ We wish to sponsor the Bicycle Ride	Amount $ _____
☐ We wish to sponsor the Morning Coffee or Afternoon Soda Breaks ($250)	Amount $ _____

You can sponsor one or as many events as you'd like.

Authorization and Payment

Make checks payable to: WWOA, 262 W. Main St, Wales, WI 53183 OR pay by American Express, Discover, Master Card or Visa (please either email to c.harris@wwoa.org or mail to address listed above).

Name on Card:_____ Signature:_____

Credit Card #:_____ Expiration Date:_____V code #:_____

Type of Credit Card:_____ Total Amount Charged $:_____

Thank you for your contribution. Your contribution greatly helps our organization and gives you the opportunity to be recognized as a supporter in the wastewater community. **Should you have questions, please contact Courtney at c.harris@wwoa.org.**

2025
WWOA CONFERENCE
GOLF OUTING

W4131 County Road O
La Crosse WI 54601

Date: Tuesday, October 14, 2025

Time: 10:00AM "Shotgun Start"/18 Holes

Prizes: Hole Prizes and Door Prizes

Cost: $95.00 per person, WWOA Members, Manufacturers, Engineers, Suppliers and Conference Attendees

Cost Includes: Golf with cart, 18 holes golf, hole prizes and door prizes, appetizers, and boxed lunch with two drink tickets.

Golf outing registrations, with names of foursome or individuals, must be received no later than **October 1, 2025.** (Committee will assign if not in a foursome).

***Do not submit with "TBD" for others in the group. Use individual names only.**

Hole prize sponsorship available for $100/hole. Please contact Courtney Harris at c.harris@wwoa.org.

No refunds after **October 1, 2025** unless course is closed by decision of Club Management. Day of event, rain checks would be issued for play, accepted through 2025 season.

Appropriate golf attire required.

Waiver: In consideration of the registering for this event, I do hereby waive and release the Wisconsin Wastewater Operators Association and all persons and agencies connected with the WWOA from all claims for damages arising from my participation in and travel to and from this event.

WWOA Conference
Golf Outing
Registration Form

Name: _____

Address: _____

City: _____

State/Zip: _____

Email: _____

Phone: _____

Part of a Foursome? **Yes** ☐ **No** ☐

Others in Group (Names only!):

_____

_____

_____

No. Paid _____ **X $95 each**

REGISTER ON-LINE WITH A CREDIT CARD OR

MAKE CHECK PAYABLE TO WWOA

MAIL REGISTRATION CARD AND FEE TO:

Courtney Harris
WWOA Golf Outing
262 W. Main Street
Wales WI 53183
c.harris@wwoa.org

2025

WWOA CONFERENCE

SPORTING CLAYS

Woods and Meadows Hunting Preserve and Sporting Clays

N4335 Potter Rd

Warrens, WI 54666

Contact Phones:

Jeff Smudde (920) 851-1087

Ben Propson (262) 689-9857

Josh Voigt (414) 719-5567

Date: Tuesday, October 14, 2025

Time: Shotgun Start 10:00 A.M.

Prizes: 1st, 2nd, & 3rd Place Team & Individuals

Cost: $70.00 per shooter; WWOA Members, Manufacturers, Engineers, Suppliers and Conference Attendees.

Cost Includes: 50 target shoot, prizes, and lunch included (please bring your own shells, since shells may not be available at Club)

Other Services: Cash Bar On-Site after shoot!

Special Door Prizes to include Rifles, Shotguns and More!

Door prizes and other donations appreciated!

Station Sponsors needed: $ 50.00 each

Major Sponsors needed: $100+

Additional Sponsor Opportunities Available

Contact Jeff Smudde if interested

jsmudde@newwater.us

Register Online with a credit card: Payment must be received no later than **October 1, 2025** with names of foursome or individuals. (Committee will assign if not in foursome).

No refunds after **October 1, 2025** unless course is closed by decision of Club Management.

Waiver: In consideration of the registering for this event, I do hereby waive and release the Wisconsin Wastewater Operators' Association and all persons and agencies connected with the WWOA from all claims for damages arising from my participation in and travel to and from this event.

WWOA Conference
Sporting Clays
Registration Form

Name: _____

Address: _____

City: _____

State/Zip: _____

Email: _____

Phone: _____

Part of a Three/Foursome? Yes No

Others in Group:

_____

_____

_____

No. Paid _____ X $ 70.00 each

REGISTER ON-LINE WITH A CREDIT CARD OR MAKE CHECK PAYABLE TO WWOA AND MAIL REGISTRATION CARD AND FEE TO:

COURTNEY HARRIS

WWOA EXECUTIVE SECRETARY

262 W Main Street

Wales, WI 53183

2025 WWOA
ANNUAL CONFERENCE
BICYCLE RIDE & LUNCHEON

Bike lanes & Great River State Trail towards Trempealeau, WI

Start/Finish 905 Joseph Houska Park Dr

La Crosse, WI 54601 (La Crosse WWTP)

Lunch:
Location to be determined

Please bring a **good bicycle lock** if bicycles need to be unattended.

Date: Tuesday, October 14, 2025

Time: 10:00 a.m. Rider Meeting & Start Leisurely Ride
~15 miles out, ~15 miles back (~ 30 miles total)

Cost: WWOA Members, Manufacturers, Engineers,

Suppliers and Conference Attendees – $30.00

Cost Includes: Continental breakfast, meal and drinks after ride at location to be determined.

Payment must be received no later than October 1st, 2025.

Please RSVP early.

No refunds after October 1, 2025, UNLESS THERE IS INCLEMENT WEATHER.

Secure bicycle storage available at the hotel

2025 WWOA Annual Conference
Bicycle Ride & Luncheon

Registration Form

Name: _____

Address: _____

City: _____

State/Zip: _____

Email address: _____

Phone Number: _____

$30.00: _____ **Bike Storage** _____

REGISTER ON LINE WITH A CREDIT CARD OR
MAKE CHECK PAYABLE TO WWOA
MAIL REGISTRATION CARD AND FEE TO:

COURTNEY HARRIS
WWOA EXECUTIVE SECRETARY
262 W Main Street
Wales, WI 53183
Email: c.harris@wwoa.org

WISCONSIN WASTEWATER OPERATORS ASSOCIATION

Keynote Speaker

John McHugh is Vice President of External Affairs for Kwik Trip, Inc., based in La Crosse, Wisconsin. In his role at Kwik Trip he has helped the company achieve recognition as a Top Workplace as listed by the Milwaukee Journal Sentinel, the Minneapolis Star Tribune and the Des Moines Register.

Prior to joining Kwik Trip in 2004, John was an instructor and principal at Aquinas High School in La Crosse. He holds degrees from the University of Saint Thomas in Saint Paul, Minnesota and the Gregorian University in Rome, Italy. John sits on the Boards of Trust Point and Viterbo University.

He and his wife Maggie enjoy living at their log home near Sparta, Wisconsin.

KWIK TRIP INC.

WISCONSIN WASTEWATER OPERATORS ASSOCIATION

Farewell Presentation

This year's conference will wrap up with a presentation discussing climate resilience for communities from different perspectives.

Mr. Erza Meyer

Mr. Meyer will lead the farewell presentation with a discussion on Wisconsin's changing climate and how this affects operations and project planning of wastewater treatment facilities in the state.

Mr. Jeremy Cramer and Mr. Ben Brooks

Mr. Cramer is the Wastewater Conveyance and Treatment Director for Sun Prairie, and Mr. Propson is the Wastewater Supervisor for the Village of Kewaskum. They will present case studies in dealing with extreme weather events. They will also cover measures to improve the reliability of wastewater treatment systems in the face of extreme weather events.

Mr. Joe Kottwitz

Mr. Kottwitz is Energy Advisor for Focus on Energy and will talk about wastewater energy efficiency opportunities.

Ms. Kate Beardmore

Ms. Beardmore is a Climate and Health Program Manager with DHS and will discuss tools available to wastewater utilities and communities that can be used to plan for potential flooding.

The presentation will end with a discussion period where attendees can share their experiences and ask questions of the group.

2025 WWOA Officers and Board of Directors

President	Marc Stephanie
President-Elect	Ben Brooks
Vice President	Jenny Pagel
Past President	Josh Voigt
Director (2026)	Cody Schoepke
Director (2025)	Aaron Eichhorst
Director (2025)	Nate Tillis
Director (2025)	KatieJo Jerzak
Director (2026)	Kevin Berg

2025 Technical Program Committee

Chair: Jenny Pagel

Committee Members:
Ben Brooks, Kevin Berg, Josh Voigt, Marc Stephanie, Nate Tillis, Aaron Eichhorst
Cody Schoepke, Katie Jo Jerzak, Diane Thoune, Chris Lefebvre, Tom Fitzwilliams, Neal Kolb
Joe Watson, Brian Helminger, Josh Steffeck, Troy Larson, Rick Mealy, Dave Hartman

2025 Exhibits, Manufacturers & Consultants Committee

Chair: Tom Mulcahy Committee Members: Jeff

Bratz, Kevin Freber, Dave Dodge, Kelly Ansett

WDNR Continuing Educational Credits (CEC) Procedures - WWOA Conference

WWOA has implemented the following procedure to comply with the WDNR electronic CEC tracking system requirements. In order for those WWOA Conference attendees to receive their required CECs, the following program will be in place for this year's conference. It is imperative that everyone that has a DNR Operators Certification Number includes it on their registration (no matter how they register - either on-line or by mail-in registration form). If you do NOT know your number, you can find it by going to the DNR website and look it up: **https://apps.dnr.wi.gov/elcpublic/optcertlookup.aspx?pg=opcert**. You can find your number and training history here. All of the Certified Operators in attendance will have a special barcode, based on their DNR Operator
number, added to their badge for scanning purposes. They will be the only attendees with barcodes.

In order to receive CECs for the Conference, everyone with a barcode on their badge will have to scan in and out on Wednesday, Thursday, and Friday. All barcode scanning will be done at the WWOA Conference Registration table. There will be special lines set up for scanning purposes. Everyone going on the plant tour will have to check in and out with the WWOA person taking attendance on the bus. You **must register** for the plant tour bus at the WWOA Conference Registration table in advance. Bus sign-up is on a first come basis.

NOTE: We will only scan one badge per person. You must bring your own badge to the Registration table for scanning. We will NOT scan multiple badges presented by one person.

The WWOA Registration table will be open the following hours during the convention:

Date	Times
Tuesday, October 14, 2024, Conference	2:00 pm to 4:00 pm (pick up registration badge only) WWOA Registration tables are in the hotel foyer near the pool dome.

Exhibitor packets will be available in their booths starting on Tuesday morning. However, any Exhibitor that has a barcode on their badge must scan in and out at the Registration table to receive their CECs.

Wednesday, October 15, 2025	7:00 am to 5:30 pm Registration and Pick Up Registration Badge Scan In and Out for CEC Hours
Thursday, October 16, 2025	7:00 am to 4:30 pm Registration and Pick up Registration Badge Scan In and Out for CEC Hours

DONOTFORGETTOCHECKOUTWITHTHEWWOAPERSONTAKINGATTENDANCEONTHEBUSTOUR

Friday, October 17, 2025	7:00 am to 11:00 am/ at Radisson Hotel Ballroom Scan In and Out for CEC Hours

On-site Registration for the Pre-Conference Seminars will be at the Registration office located in the hotel foyer near the pool dome.

Every participant will receive CECs based upon their scan in and out times. If you scan out early, you will only receive. CECs for the time that you are in attendance at the WWOA Conference. There will be signs placed throughout the facilities reminding everyone to scan in and out. Ultimately, this will be the responsibility of each attendee to do so.

Everyone that requires **Professional Development Hours (PDHs)**, please check in at the **Registration Office**

WI DNR CECs Available for Certified Operators During the 2025 Conference

	Conference		Operators Competition
Approved Credits:	Municipal Water	Wastewater	Judges & Competitors only
Tues. Precon:	3	3	
Wednesday:	5.5	5.5	2
Thursday:	7.3	7.3	
Friday:	2	2	
Total Credits	17.8	17.8	19.8

CELEBRATING *50 YEARS*
OF PROVIDING OUR
CUSTOMERS WITH THE PEACE
OF MIND THAT THEIR PROJECTS
WILL BE DONE RIGHT

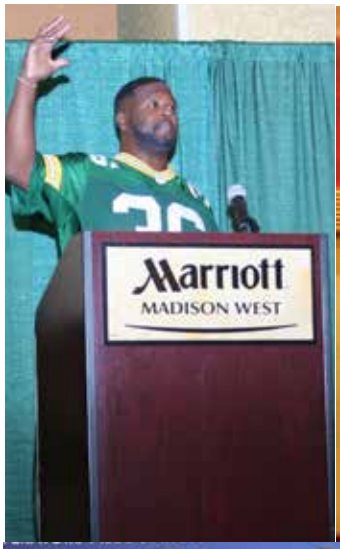
REPUTATION
Just one of the core values we live by every day at
Visu-Sewer
Inspect. Maintain. Rehabilitate.
800-876-8478 www.visu-sewer.com

Northern Lake Service Inc.
ENVIRONMENTAL ANALYTICAL LABORATORY
Great People. Trusted Results.®

- BOD & TSS
- Nutrients & Metals
- Permit Renewal Testing
- TTOs
- Sample/Field Collection Services
- NR538 Testing

Certified for PFAS Testing
1-800-278-1254 clientservices@nlslab.com
www.nlslab.com
Coming Soon: Online Data and Pay Portal

Memories from past WWOA conferences



ClarkDietz
Engineering Quality of Life®

integrated
WATER QUALITY
SOLUTIONS

WATER | WASTEWATER | STORMWATER
Kenosha • Milwaukee • Wausau • clarkdietz.com

Sun Prairie's tertiary filtration retrofit: Implementation and multi-year results

Matt Castillo, MSA Professional Services, Inc. [mcastillo@msa-ps.com]
Jeremy Cramer, City of Sun Prairie [jcramer@cityofsunprairie.com]

BACKGROUND AND PROJECT DRIVERS

By the late 2010s, Sun Prairie's tertiary filtration was showing its age. The system relied on three traveling-bridge sand filters installed in 1982, with media replaced in 2004. Age and hydraulic limitations were growing concerns, and the city's population growth meant wastewater flows to the plant were expected to increase steadily in the coming decades.

Regulatory pressure added to the challenge. New total phosphorus (TP) limits required the facility to meet 0.075 mg/L on a six-month average. EBPR alone could not consistently achieve that level, especially during periods of high flow or variable influent quality.

To address both capacity and water quality, the City moved forward with a major upgrade. The project repurposed the sand filter basins, installed two disc filter units, and provided a robust ferric and polymer conditioning system.

By summer 2022, the new tertiary system was online. Two years of operating data show reliable effluent quality, with an average total phosphorus concentration of about 0.060 mg/L, manageable backwash demands, and consistent performance. This stability is supported by an operator team that uses data to guide decisions and takes a proactive approach to daily operation and maintenance.

A RETROFIT DESIGN

In an effort to use existing infrastructure, the City and design team reused the existing filter basins to house the filter units and chemical addition system. Two of the sand filter tanks now house the two disc filters, which

continued on page 38

continued from page 37

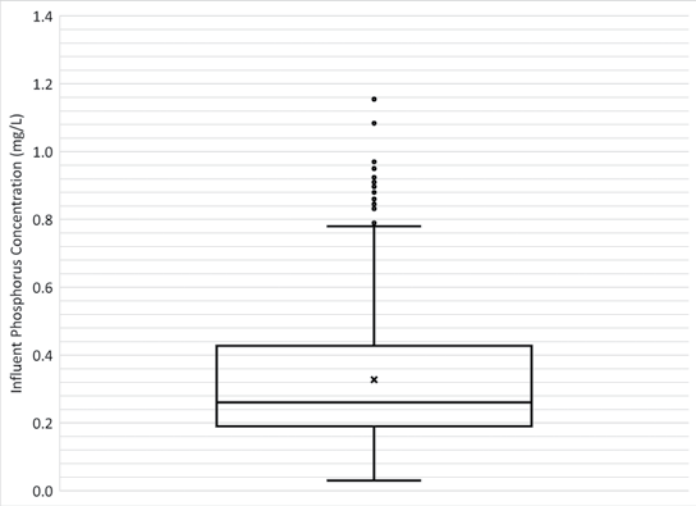
operate in parallel. The third basin contains chemical storage, secondary containment, and chemical addition equipment such as the polymer system and chemical feed pumps. Three new tanks were constructed as rapid mix, coagulation, and flocculation tanks. Ferric sulfate is added to the rapid mix tank. Low-molecular-weight anionic emulsion polymer is added between the coagulation and flocculation tanks.

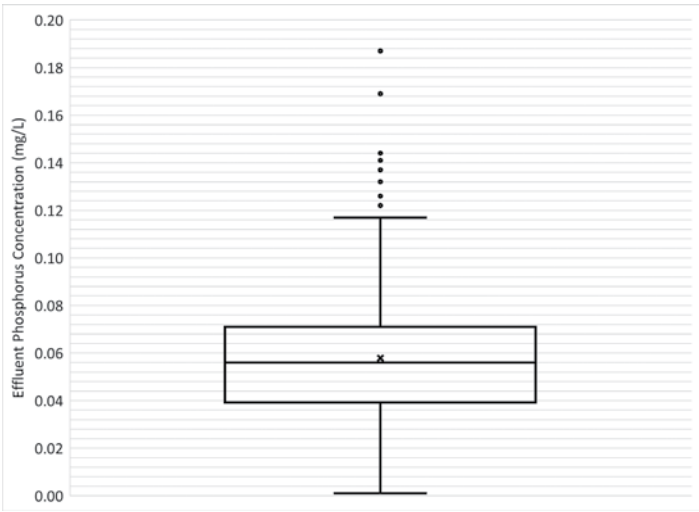
Table 1. Design and Performance Summary

Parameter	Value
Design average and peak flow	6.0 mgd and 9.3 mgd per filter
Filters	2 units with 40 discs each
Mixing HRTs	Rapid mix = 1.0 min Coagulation = 6.5 min Flocculation = 6.5 min
Typical chemical doses	Ferric = 25-30 mg/L Polymer = 1.1-1.2 mg/L
Average effluent TP	0.058 mg/L
Average backwash % of forward flow	4.2%
Cleaning cadence	Acid and base about every 32 days
Estimated energy consumption	811 kWh/day

TWO-YEAR PERFORMANCE EVALUATION

From mid-2022 through 2024, influent TP to the filtration system averaged 0.33 mg/L. The filtration process produced an average effluent of 0.058 mg/L, with roughly 80% of the samples at or below 0.075 mg/L. The following figures display the data distributions of influent and effluent phosphorus concentrations, respectively.





HYDRAULICS, SOLIDS, AND BACKWASH

Filters operated at an average hydraulic loading rate of 0.7 gpm/ft², with peaks approaching 2.2 gpm/ft². Following chemical addition, influent solids to the filters averaged 15 mg/L and reached as high as 85 mg/L. Biological solids alone (secondary clarifier effluent) averaged 3 mg/L and peaked at 35 mg/L. Backwash water reject rates averaged 4.2% of the forward flow and increased to 9.7% during high-solids periods. Effluent TP remained stable during variable hydraulic and solids loading rates, suggesting that the chemical addition system and filter units maintained performance despite changing conditions.

CONTROLS STRATEGY AND CHEMICAL ADDITION

Chemical dosing can run in two modes. In constant-dose mode, operators set a target concentration, and the chemical pumps pace to either influent or effluent flow as selected. In matrix mode, operators program orthophosphate concentration bands with corresponding doses. An online orthophosphate analyzer samples both the filter influent, upstream of chemical addition, and the filter effluent. The orthophosphate analyzer's readings select the programmed dose, and the chemical pumps are paced to the chosen flow reference.

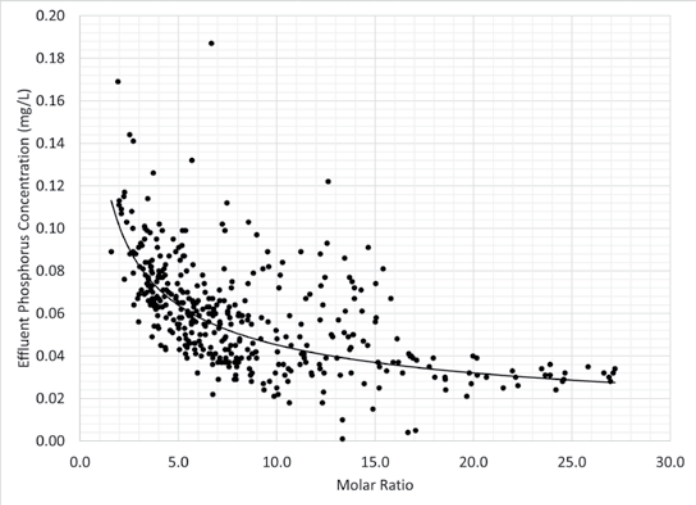
Ferric feed averaged 140 gal/day. Over the dataset, the Fe:P molar ratio ranged from 1.6 to 79 and averaged 8.6. Over the two-year evaluation period, the coagulant system operated in constant-dose mode, targeting a range of 25 to 30 mg/L.

Polymer addition averaged 4 gal/day. The polymer system also operated in constant-dose mode with a target of 1.1 to 1.2 mg/L.

continued on page 39

continued from page 38

The following figure shows the observed dose-response curve. Fe:P ratios between 5 and 10 most often produced effluent phosphorus below 0.075 mg/L.



ENERGY AND ROUTINE MAINTENANCE

Higher chemical use can lead to long-term media fouling, so the filters are equipped with an automated cleaning system. Operators cleaned both filters on the same day, using both acid and base solutions, about every 32 days on average. This routine helped control fouling, maintain stable headloss, and keep backwash rates consistent.

From January through June 2024, the tertiary system used an average of 811 kWh per day. Mixers accounted for just over 60% of total energy use, while backwash pumps and disc drive motors made up the remaining 40%.

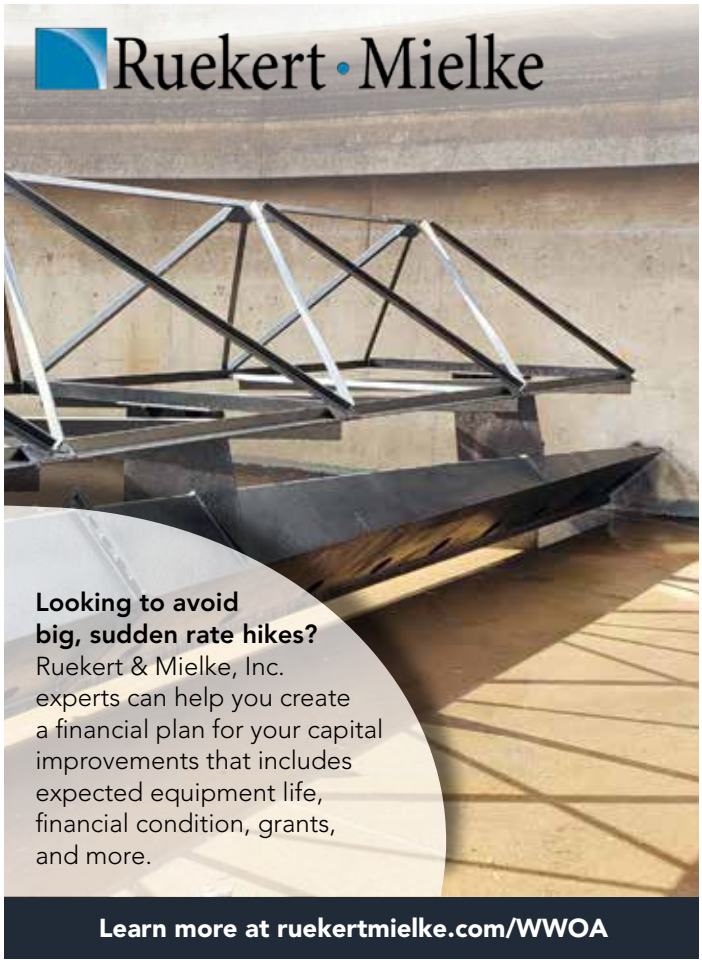
DATA-DRIVEN GUIDANCE FOR LOW-P FILTRATION

- Chemical addition is key: Molar ratios (Fe:P) between 5 and 10—corresponding to ferric doses of 25–30 mg/L and polymer doses of 1.1–1.2 mg/L—show that effective chemical conditioning followed by surface filtration can consistently meet ≤0.075 mg/L. Floc quality is the primary driver of filter performance.
- Prevent settling: Monitor filter influent channels and chemical mixing tanks to avoid the buildup of chemical solids in unintended locations.
- Use flexible, simple controls: Orthophosphate analyzers can optimize chemical feed systems, while constant-dose operation provides reliable simplicity. Having both options allows operators to adapt to changing conditions.
- Watch hydraulic capacity: High chemical solids loadings affect filtration hydraulics. Running both filters in parallel can provide the needed capacity during peak flow events.
- Plan for higher backwash rates: Achieving low phosphorus limits with chemical addition often results in backwash rates higher than typical tertiary filter applications.
- Make maintenance routine: Clean filter media on a regular schedule to control fouling and maintain stable performance.
- Leverage data: Track chemical use, TSS and orthophosphate concentrations, hydraulic and solids loading rates, backwash percentage, and cleaning dates. Review the information regularly to fine-tune the system based on data.

IN SUMMARY

The City of Sun Prairie successfully modernized its aging tertiary filtration system through a strategic retrofit that repurposed existing infrastructure and integrated advanced disc filters with chemical conditioning. Driven by regulatory demands and anticipated population growth, the upgrade has delivered consistent, high-quality effluent with total phosphorus levels averaging 0.058 mg/L — well below the required limit.

continued on page 40



continued from page 39

Over two years of operation, the system has demonstrated resilience under variable hydraulic and solids loading conditions, thanks to a data-driven control strategy, proactive maintenance, and flexible chemical dosing. This project highlights the effectiveness of combining enhanced filtration technologies with thoughtful design and operational practices to meet stringent water quality goals.

Old sand filter

New disc filter closeup

New disc filters

about the Sportsman's board

Have a picture for the Sportman's board?

Send the picture and a description of where you were hunting to doralee.piering@energenecs.com.

We will do our best to put it in the next available issue of the Clarifier.

Youth apprenticeship benefits everyone

Any student—regardless of future plans—can benefit from an apprenticeship. It's a powerful model of education that reveals multiple options to careers and higher education. Youth Apprenticeship (YA) is a 1 or 2-year program that gives juniors and seniors in high school the chance to explore a career area of interest. Students spend part of their school day earning credit and wages while they gain valuable industry experience under the guidance of a local business mentor.

Every Youth Apprentice student that successfully completes the career path program requirements will earn an Occupational Skills Proficiency Certification. This certification verifies that they have gained the skills, knowledge, and experience necessary to be successful in their chosen industry within the state of Wisconsin.

There are some requirements for an employer to be involved in the YA program. The youth apprenticeship is a paid position that must meet minimum wage. There is a minimum of 450 hours that must be achieved throughout the summer and the corresponding school year. Of the 450, 200 hours can be counted in the summer toward the YA. Students continue the remaining 250 hours throughout the school year so schedule flexibility can play a role in meeting that requirement. These are all discussions to be had with the representative in your area as well as the student and school staff.

WWOA is partnering with Inspire WI to promote our membership's opportunities for employment, education, and involvement with local students. Inspire WI works in unison with CESA, they promote the industry to aid in that connection between students, educators, and our incredible career pathways. This network puts our industry in touch with interested people we may not have had a chance to reach and it does this through a few clicks of a mouse at any time.

Through this partnership, WWOA members can be visible and engaged. This can be a proactive approach for future vacancies or provide an opportunity to fill a seasonal role and at the same time provide that experience to hopefully promote a desire to continue in our field, either through education or a career.

For more information or to get started, go to https://www.cesa6.org/ https://inspirewi.org/


ONE-SOURCE SOLUTION FOR
MULTI-TRADE
CRITICAL SYSTEM
CONTRACTING.
960
Over the past decade, Ahern has completed over 960 water and wastewater projects of all sizes.
AHERN SINCE 1880
Mechanical & Fire Protection Contractor
HVAC | Plumbing | Controls | Sprinkler
Extinguisher & Alarm | Fabrication
Service & Construction
800.532.4376 | jfahern.com
CELEBRATING 145 YEARS

How can I get more fields approved for land application?

By : DNR Staff

The Wisconsin Department of Natural Resources ("department") regulates the land application of sewage sludge (aka "biosolids") and industrial wastewaters under ch. NR 204 and NR 214, of Wis. Adm. Code. All facilities that land apply sewage sludge or industrial wastewaters shall be issued a Wisconsin Pollutant Discharge Elimination System ("WPDES") permit. These permittees are required to follow permit requirements to ensure protection of public health and welfare, and maintain and protect the physical, chemical, and biological integrity of groundwater and surface water.

Permittees may request land application site approvals at any time. The department's standard for completing a site review is within 30 days of receiving a request, however often these reviews are completed within two weeks.

Permittees must complete a "Land Application Site Request" (form 3400-053 AKA "53 Form"). Permittees can contact their regional landspreading specialist (listed below) for a copy of this form. The 53 Form incorporates landspreading requests for municipal sewage, industrial wastes (industrial liquid waste, by-product solids, and industrial sludge) and septage.

Permittees requesting a new/updated land application site must complete and submit the required items on pages 1-3 of the 53 Form along with an aerial photograph of the requested site (with site boundaries marked), a soil map unit (with descriptions of the soil classification), proof of ownership (example: tax parcel record), and a soil test report for sewage sludge. Pages 4 and 5 detail site limitations of each waste. Instructions on pages 6-10 assist with completion of the 53 Form. Though this form may seem long, after submittal of a few requests it can be done with reasonable efficiency.

When reviewing land application site request packages, the department utilizes soils data from the Natural Resource Conservation Service (NRCS) Web Soil Survey (WSS). WSS provides county-specific soils data for each soil map unit and is used to identify potential restrictions including, but not limited to:

- Shallow groundwater less than 36" from surface,
- Shallow bedrock less than 36" from surface,
- Coarser textured ("sandy") soils with high permeability and low water holding capacity,
- Steep slopes (greater than 12%), and
- Severe soil erodibility.

Permittees are unable to landspread in restricted areas. However, the permittee may consider hiring a "qualified individual" to demonstrate these area(s) comply with code requirements. For additional details on this process please contact your regional landspreading specialist (listed below).

In some instances, the permittee may consider optimizing acreage on existing approved sites. In these situations, the department recommends the permittee update their management plan (MP), if the facility has one, to detail the land application practices used by the facility. MP's outline how the wastewater is stored, transported, and land applied on department-approved agricultural fields. The MP typically serves as a standard operating procedure (SOP) for the permittee's employees and/or contractors to reference and implement. A MP can be a highly useful tool for training new employees or haulers and is highly recommended by the department. For more details regarding the MP, the permittee should contact their assigned department regulator.

For further details on the site submittal process for site optimization, please contact your regional landspreading site review listed below.

South Central Region (SCR):
Kassandra Schultz (Kassandra.Schultz@Wisconsin.gov)

Southeast Region (SER):
Stephen Warrner (Stephen.Warrner@Wisconsin.gov)

Northeast Region (NER):
Teresa Hall (Teresa.Hall@Wisconsin.gov)

Northern Region (NOR):
Alison Caniff (Alison.Canniff@Wisconsin.gov)

West Central Region (WCR):
Peter Carlson (Peter.Carlson@Wisconsin.gov)

For general questions on the department's site review process, please contact Stephen Warrner, Statewide Site Review Coordinator (email above).

If you have other questions for the DNR, email us at AskTheClarifier@WWOA.org!

WISCONSIN WASTEWATER OPERATORS ASSOCIATION, INC.

Southern Region Tuition Aid Criteria

The purpose of tuition aid is to encourage the continued education of WWOA Southern members through the attendance of Wisconsin DNR-approved advanced coursework related to wastewater treatment or for credit courses at an accredited university, college or technical school while working towards a degree related to the wastewater/water industry.

REQUIREMENTS and CRITERIA

1. Applicant must be a member of the WWOA Southern Region or have a recommendation from a member.

2. Award value will be decided on a case-by-case basis not to exceed 25% of available funds each year. Multiple scholarships may be awarded during each review period.

3. Applications will be reviewed Quarterly. All applications, using the form below, must be received prior to 30 days before the end of each quarter. Deadlines Q1: February 28/29, Q2: May 31, Q3: August 31, Q4: November 30.

4. Tuition aid recipients must provide proof of successful completion for each seminar and/or course before tuition aid reimbursement payment will be paid. Recipients must submit the necessary documentation to the WWOA Association Manager within 30 days of seminar and/or course completion.

Submit the completed application and attachments (via email) to:
Wisconsin Wastewater Operators Association Southern Region Board Member

POP QUIZ!

QUESTION: WHY INSTALL SHINMAYWA CNWX SUBMERSIBLE PUMPS WITH SCROLL IMPELLERS?

ANSWER: NO MORE CLOGGED PUMPS

OVER 400+ INSTALLATIONS IN WISCONSIN

CALL B&M TECHNICAL SERVICE, INC.
715-228-7604 | BMTECHSERVICE.COM

B&M TECHNICAL SERVICE, INC. LEADERS IN SERVICE & SOLUTIONS

WISCONSIN WASTEWATER OPERATORS ASSOCIATION

Donation Form

Protecting Public Health and the Environment by Providing a forum for Wastewater Technology Exchange and Education.

WWOA Education Fund Donation Detail

Please Complete this form and submit with donation

Donor Information:

Name	
Company	
Street Address	
City, State, Zip	
Phone	

Date:	
Amount of Donation:	

Thank you for your donation!
Your support of the WWOA education fund is greatly appreciated!

Please submit donations to: Wisconsin Wastwater Operators Association
ATTN: Education Fund, 262 W Main St., Wales WI 53183

Disbursements from the Educational fund will be made on a case-by-case basis by vote of the WWOA board of directors. Funds would be used to promote educational goals related to the wastewater treatment field. Disbursements brought to the board by the Scholarship committee chair would include sponsoring an additional scholarship opportunity when there are many well qualified candidates on a given year or sponsoring an additional tuition reimbursement payment when there are many qualified candidates on a given year. Other common disbursements could include but are not limited to, sponsoring the registration fee for a trade show, conference, or training event for an individual or group, purchasing equipment used for the promotion of educational goals in the organization, or other disbursements that the board deems in line with educational goals of the organization.

Avoid Unexpected Costly Repairs

Authorized Statewide Distributor of SULZER

Preventative Service Program

WISCONSIN PUMP WORKS
-a UFT Company-

EXTENSIVE EXPERIENCE

We use late-model service rigs with 8000 pound lifting capacities, Sprinter vans, and advanced tooling to ensure the longevity of your rotating equipment. **Wisconsin Pump Works** will help maintain your investment and keep it running smoothly!

ROUTINE MAINTENACE

The proactive maintenance approach we provide can help you reduce downtime and increase the life cycle cost of your equipment. We make expert recommendations that provide strong value for your budget decisions.

21 POINT INSPECTION

Let our expertise, strong reputation, and proven repair processes help assess your water/wastewater transportation system and provide an evaluation report so you can make an informed decision about your system today!

Call us today! 877-645-8004

www.wisconsinpumpworks.com

BOD, What is it?

By Jon Butt, Mead & Hunt, Inc.

Welcome to a new feature of the Clarifier. The goal of this new feature is to answer any questions you have on different segments or parts of the wastewater profession. We encourage anyone to submit a question or topic to AskTheClarifier@wwoa.org.

The first topic for this new feature is BOD. We use BOD every day. Our WPDES permits include BOD as limits that carry legal authority. USEPA defines secondary treatment in terms of percent removal of BOD. Textbooks talk about BOD, equipment salespeople highlight performance in terms of BOD removal, and the list goes on and on. But have you actually stopped to remind yourself of what BOD is?

BOD by definition is the result of a test and nothing more. The result of a test and not a very accurate test either. I have not done this challenge, but it is highly probable that if you collected a sample and split it in 10 ways and then sent to different labs to run a BOD test, you would likely get 10 different results. The results would be close, but none would be the same.

BOD is not a thing like ammonia or TSS. And you cannot directly measure BOD. You cannot say with any certainty what specifically or chemically is BOD. Ammonia is a molecule that has 1 nitrogen surrounded by 4 hydrogens. TSS is something that can be filtered. None of this applies to BOD. Because BOD is not a thing, but rather the result of a test that takes 5 days to complete, you can not measure BOD directly with an instrument. Any instrument that claims to "measure" BOD does not. Instead, instruments will measure other things such as carbon and then attempt to draw a correlation between what is measured and BOD. In some cases, these instruments can help predict changes which can be helpful for process control, but the information is only as good as the correlation, and the correlation is only as good as the data used to develop it.

I understand why BOD is important. My brief research on the internet tells me the biological demand test was developed in the United Kingdon as a way measure pollution in the Thames River around the turn of the century. The five-day incubation period was chosen based on the estimated time it took for sewage to flow from London to the sea. Low oxygen levels in receiving waters have long been known to be caused by excessive pollution so it only seemed logical to estimate the oxygen demand of wastewater. Who would have guessed that a test adopted around 1908 would still be used today to regulate wastewater treatment?

BOD may be a way to estimate pollution levels, but BOD is an awful parameter to use to control our treatment plants. It takes many days to get a result. Unless you are operating a lagoon or something that has a very long retention time, it is very likely that wastewater you sampled and tested for BOD has passed through the entire treatment process before you get your test result. Any process change made based on BOD is a change made to conditions that no longer exist. Most operators will use other parameters for process control.

We already established that BOD is the result of a test. What do we mean when we say we are "removing BOD?" How do you remove the results of a test? This is where we need to be careful. Our wastewater is made up of many different pollutants. A high percentage of these pollutants

continued on page 47

Excellence in Engineering℠

Mount Horeb, WI | Wastewater Treatment Plant

STRAND ASSOCIATES®

www.strand.com
12 Locations • 608.251.4843

Multidisciplinary firm serving public and private sectors

continued from page 46

are biodegradable serving as food to the activated sludge. Biodegradable pollutants will have a BOD result. The higher the concentration of biodegradable pollutants, the higher the BOD test result. There are other pollutants that can also be measured as BOD even though they might not be biodegradable. Sulfite is an example. Sulfite is frequently used in de-chlorination but sulfite will also react with oxygen and in a BOD test will increase the BOD test result. Still other pollutants can hinder oxygen uptake and will cause lower BOD test results. To be accurate when we refer to "removing BOD" what we are actually saying is that we are removing biodegradable pollutants from our wastewater.

But here is a dirty little secret … not all BOD is the same? Or perhaps more correctly, the waste pollutants that result in BOD may be different depending on where the sample is collected. A sample taken at our house will have different biodegradable components as compared to the influent at our treatment plants as compared to effluent from the treatment plants. This fact is critically important as we approach designs and equipment sizing. But I'll save this for another day. Just know that influent BOD and effluent BOD are not the same, even though we use the same test to measure BOD. Remember, BOD is nothing more than the result of a test and is not a thing. It is highly probably that effluent BOD is derived mostly from biomass and that influent BOD is derived mostly from biodegradable pollutants.

Yes, our permits require us to use a test adopted in 1908 to report pollutant discharges. We cannot change this fact. But we should never forget that BOD is not a thing but is nothing more than the result of a test.

Ask the DNR!

Have a question you'd like to ask the DNR?

Just email it to:
AskTheClarifier@wwoa.org

sentry™

Always on, Quality monitoring

Are biological imbalances causing you effluent issues?

Biological upset ?
Toxicity ?
Treatment performance issues ?

Track treatment performance in real-time to help you make informed decisions.

Find out how we saved a client **over $75,000 through optimization** of their biological treatment facility.

sentrywatertech.com

MSW
MULCAHY SHAW WATER

mulcahyshaw.com

Attention – Immediate opening on the Clarifier staff Are you looking for a way to serve?

Jon Butt – Editor

After 13 years of extraordinary service, Ron Dickrell has announced that he will be retiring from his position on the Clarifier staff. For those that do not know, Ron has led the effort to select and collect information on the wastewater treatment plant that is featured in every issue of the Clarifier. We all can agree that the featured WWTP is one of the highlights of the Clarifier. Ron conveyed that he loved the camaraderie he developed with colleagues associated with each featured plant. I pressed Ron to make sure that this is what he wants, and he replied that he thinks it is time for some new blood to enjoy the adventures and to continue a relationship with all the people Ron has worked with. Ron is a valued part of the Clarifier and he will be missed.

But with Ron's decision comes an opportunity for another member of WWOA to take on this important role. The Clarifier is seeking a candidate to assume the responsibility of finding a treatment plant to be featured in each issue. Responsibilities include selecting a plant, working with staff to write an article, maintaining records of plants selected, and coordinating with the editor and the production lead on the article on the cover photo. Ron tells me that he has the featured wwtp identified all the way into 2028, which should make the transition for a new person easy. Ron is not going away and will be available to assist with the transition.

This is a wonderful chance for someone to help support WWOA. Anyone interested in learning more about this opportunity, please contact me.

Register for the conference at

https://www.wwoa.org/conference-home-2025

CONCENTRIC INTEGRATION

MUNICIPAL TECHNOLOGY SERVICES

Personalized service.
Extensive resources.

CSIA CERTIFIED

ELECTRICAL & AUTOMATION

- Electrical & Control Systems Design
- Motor Controls & Control Panels
- SCADA, Reporting, Alarming & Notification Systems
- SCADA Master Plans/Assessments & Budget Planning
- PLC Implementations, Upgrades & Migrations
- Instrumentation
- Technology Planning
- Proactive Maintenance

INDUSTRIAL IT

- Networking Design & Configuration
- Telemetry Replacements/Upgrades
- Proactive Maintenance

goconcentric.com

815-788-3600 | support@goconcentric.com

24/7/365 SUPPORT

FLYGT
a xylem brand

LET'S TURN PUMPING ON ITS SIDE WITH FLYGT N-HORIZONTAL.

Flood proof horizontal mounting with roll back service cart

Drainage port for quick and clean servicing

Patented telescopic inlet for easy inspection and maintenance

Simplified impeller check and adjustment with roll back cart and telescopic inlet

Flygt N-Pumps, the industry standard for handling sludge and wastewater, are the perfect solution for drypit horizontal flood proof installations. We asked hundreds of users what you wanted (and didn't want) in a dry-installed pump. The result: quick and easy maintenance with stainless steel roll-back service cart, easy access with a patented telescopic opening and a better working environment with a drainage port that empties the pump housing before you begin work. By going horizontal, you get better suction, cleaner wet wells, rigid installation and a safer working environment.

12 MONTH CLOG-FREE GUARANTEE

Put more than 60 years of pumping experience to work in your drypit installation.

Xylem Wisconsin Branch
For: Pump repairs, replacements, service contracts, 24/7 service and more
N26 W23445 Paul Rd
Pewaukee, WI 53072
262-544-1922

xylem.com

xylem
Let's Solve Water

Clarifier index of advertisers

WISCONSIN'S PREFERRED
PUMP & CONTROL SYSTEMS PROVIDER

It's all in the numbers! With over 600 pump customers, 500 controls customers, and 1,000 municipal sites across the state, L. W. Allen and Altronex are your one-stop-shop solution for Wisconsin and the surrounding area. It's easy to see why so many put their trust in our services.

L.W. ALLEN PUMP SYSTEMS. ALTRONEX® Control Solutions by SJE

4633 Tompkins Drive, Madison, WI 53716 • 1802 Brackett Ave, Eau Claire, WI 54701
(608) 222-8622 • FAX (608) 222-9414 • www.lwallen.com

WISCONSIN WASTEWATER OPERATORS ASSOCIATION
262 W. Main Street, Wales, WI 58183

ADDRESS SERVICE REQUESTED

Trust the experts - Our team of chemists are here to help!

NC LABS

1-800-648-7836
www.nclabs.com
Lab Supplies Since 1985

- No minimum order
- Courteous Service
- Instant credit to municipalities and sanitary districts
- 98% of all orders ship within one business day

CELEBRATING 40 YEARS 1985 - 2025

Celebrating 40 years specializing in wastewater reagents & supplies!

1-800-648-7836
Email: sales@nclabs.com

Order Online
www.nclabs.com