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AERIAL VIEW OF
IXONIA WASTEWATER TREATMENT PLANT, IXONIA, WISCONSIN

The Clarifier

VOL. 266 JUNE 2026

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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.

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Presidents message: The season of progress

Greetings WWOA Members,

Have I ever mentioned how much I love being a grandparent? If I haven't, let me say it now, it's a pretty incredible job with outstanding pay in the form of hugs, laughter, and unforgettable memories. While the parents of our four grandchildren are tasked with enforcing the rules, bedtimes, and making sure vegetables are eaten, my wife and I get to enjoy all the giggles, the spoiling, and the magic that comes with watching childhood unfold. It truly is a



blessing to watch your family grow and to see your heritage continue through the next generation. I feel incredibly fortunate to have such an amazing family.

Spring weather here in Wisconsin seemed to arrive a little late this year, but I was thankful that Memorial Day brought favorable weather conditions that allowed many of us to get outside and enjoy the weekend. I hope everyone had an opportunity to spend some time outdoors with family and friends while also taking a moment to honor and remember all those who made the ultimate sacrifice in service to our great country.

Spring also means one thing for many of us in the wastewater world—biosolids hauling season. It's that time of year when treatment facilities across the state are coordinating hauling schedules with landowners while keeping one eye on the weather forecast and the other on planting schedules. If you've been involved in biosolids management, you know exactly what I'm talking about. Timing is everything, and as we all know, Mother Nature doesn't always cooperate.

Many facilities are fortunate enough to get storage sheds emptied before planting gets underway, while others are left waiting for first crop hay to come off before surface application can begin. Regardless of the challenges, operators across Wisconsin continue to do an outstanding

job managing biosolids responsibly, safely, and in compliance with WDNR requirements. I want to recognize everyone involved in these programs—from operations staff and truck drivers to landowners and managers—for the hard work, planning, and coordination it takes to make these programs successful year after year. Your efforts are essential to keeping operations moving forward and ensuring we continue to be responsible stewards of our environment.

As we move into summer, many facilities are shifting into another busy season filled with projects, maintenance work, construction schedules, permit compliance, and everything else that comes with keeping treatment plants and collection systems operating efficiently. It's a demanding profession, and it rarely slows down. I continue to be proud of the work our members do every day behind the scenes to protect public health, preserve Wisconsin's waterways, and serve their communities.

The WWOA Board of Directors also remains busy planning for the upcoming 60th Annual WWOA Conference in Green Bay. It is exciting to be part of such a milestone year for our association. Reaching 60 years is a testament to the dedication, leadership, and commitment of the wastewater professionals who came before us and those continuing the work today. We're looking forward to celebrating that legacy together while also focusing on the future of our industry.

By the time you receive this issue of The Clarifier, registration for the Annual WWOA Conference will be open. Please remember to register early and make your hotel reservations well in advance. With this being our 60th Annual Conference, we're anticipating another great turnout, and we look forward to seeing members from across the state come together to learn, connect, and celebrate this important milestone for WWOA. Also, please nominate that deserving individual/operator for one of the prestigious WWOA awards. Recognition for a job well done should never go unnoticed so start here with your nominations. Award nomination forms and conference registration can be found on the WWOA website.

Thank you for everything you do for your communities, your utilities, and our profession. I hope you all have a safe, productive, and enjoyable start to summer. I look forward to seeing many of you at upcoming WWOA events and later this year in Green Bay. 🌞

Respectfully, Ben Brooks
President Wisconsin Wastewater Operators Association

Transforming Wastewater Treatment in Ixonia, Wisconsin

Ix-What?

The Town of Ixonia (eye-ks-oh-nee-uh), population 5,120 (2020 Census), is located outside of Oconomowoc and spans Jefferson and Waukesha Counties. The town's distinctive name dates back to 1846, when residents, unable to agree, selected letters from a hat until a name was formed.



Scan QR code for an Aerial Flyover of Ixonia

Today, residents are served by one of two utility districts. Utility District #2 conveys wastewater to the City of Oconomowoc, while Utility District #1 treats wastewater locally. Until 2024, that treatment relied on a recirculating sand filter facility located in the center of Ixonia's business park.

The original facility, constructed in 1984 and expanded in 2004, was designed to serve a population of 768 with a capacity of 162,000 gallons per day (gpd). At the time, regulatory requirements focused primarily on biochemical oxygen demand (BOD) and total suspended solids (TSS).



Figure 1 Recirculating sand filter facility (former plant)

Over the years, however, permit conditions evolved. A chloride limit was introduced in 2008, followed by ammonia limits in subsequent permits, limits the facility struggled to meet. At the same time, growth continued. By 2019, the sewered population had reached 1,586, with projections estimating nearly 4,000 residents by 2040. Flows had already exceeded design capacity, and phosphorus limits were expected in the next permit cycle.

continued on page 6



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A New Facility Designed for the Future

While capacity constraints and ammonia compliance alone justified expansion, phosphorus requirements posed a more fundamental challenge. Recirculating sand filters are not well-suited for phosphorus removal, as they lack effective solids separation. Without solids removal, neither biological nor chemical phosphorus removal is practical. Meeting future permit limits would require a different approach.

Ixonia elected to construct a new wastewater treatment facility at a different location, allowing the existing site to remain available for industrial development. The new plant was sited along the west side of the Rock River, south of State Highway 16, positioning it closer to a potential outfall and reducing long-term pumping considerations. Rather than abandoning the existing infrastructure entirely, the dosing pump station was repurposed as an influent pump station, screening incoming wastewater and conveying it approximately one mile to the new site.

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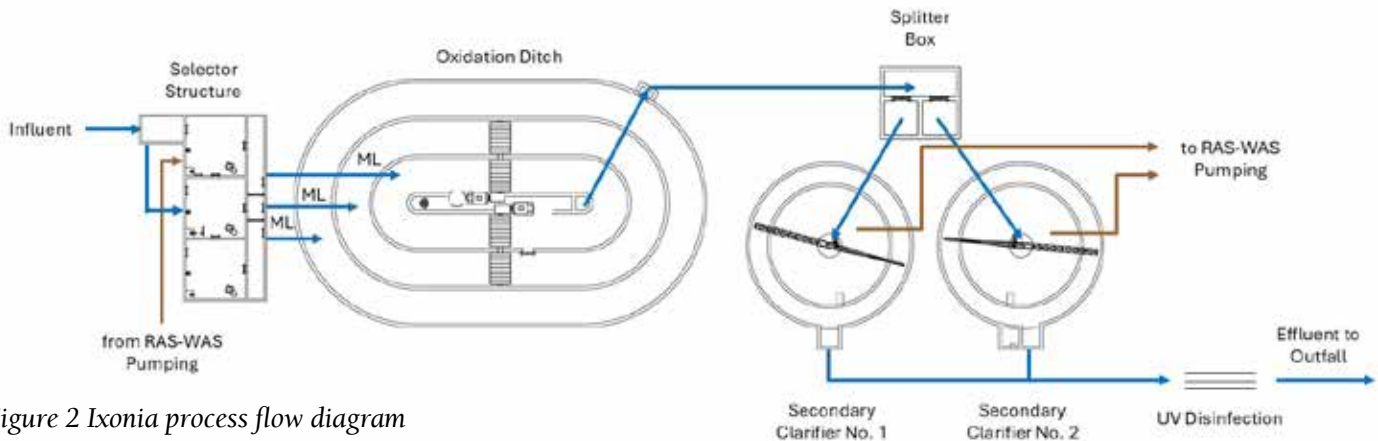


Figure 2 Ixonia process flow diagram



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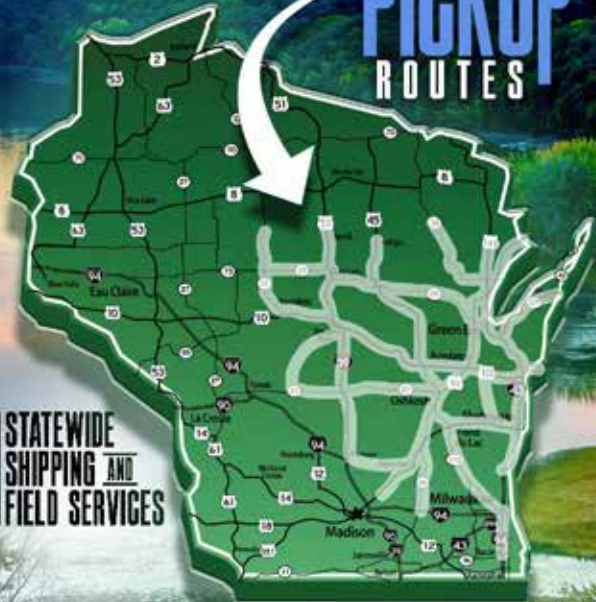
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continued from page 6

- From the outset, the project was guided by three priorities:
1. Meet all Permit Limits – Including Phosphorus Removal
 2. Minimize Operator Intervention
 3. Accommodate Future Growth

The selected site played a significant role in achieving these goals. A natural elevation drop of more than 30 feet allowed the entire treatment process to function by gravity, eliminating the need for internal pumping. In addition, the site provides ample room for expansion, with future treatment processes and parallel systems planned so capacity can ultimately more than double without requiring additional land or major reconstruction.

Treatment begins as screened influent enters selector basins designed to operate as an A2O biological nutrient removal process. These selectors allow flexible return activated sludge (RAS) distribution and include mixers, ORP probes, and isolation features for maintenance. Downstream, flow enters a three-ring oxidation ditch. Only two rings are currently equipped with aeration; the third serves as storage and provides future capacity. Constructing the third ring

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during initial excavation reduced long-term capital costs while preserving flexibility.

From the oxidation ditch, flow proceeds to two secondary clarifiers equipped with launder covers to reduce maintenance and limit algae growth. Effluent and solids are then conveyed to the process building, which was designed with space and connections for future tertiary filtration,



Figure 3 Site layout. Green highlights indicate locations for potential future expansion capacity.

although current performance does not require it. Effluent undergoes UV disinfection before discharge to the Rock River.

Solids handling is managed within the same building. RAS is routed back to the selectors, while waste activated sludge (WAS), along with scum from the clarifiers, is directed to a biosolids storage tank. The tank is mixed and includes a decant system to reduce hauling volume prior to land application.

Startup Challenges and Early Success

The startup of the new facility presented several challenges. Located in what was previously a cornfield, the site had limited access to water for initial filling and testing. Stored rainwater and construction dewatering were used to fill tanks and conduct leak testing. Equally important was the need to establish a healthy biological population capable of achieving phosphorus removal from the outset, as meeting permit limits immediately upon discharge was a requirement.

Biomass was sourced from Johnson Creek's oxidation ditch facility; however, the seeding process did not unfold as

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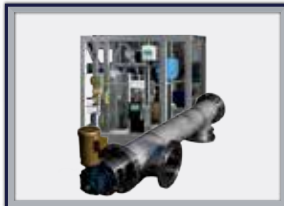
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originally planned. WAS, expected to be approximately 0.7% total solids, proved difficult to extract, and the material ultimately available was closer to 0.2% total solids mixed liquor. This significantly diluted the seed concentration. To facilitate the seeding process, operators initially diverted only a portion of the flow to the new plant, continuing to treat the remainder at the existing facility while allowing biomass to accumulate.

Within 10 days, half of Ixonia's flow was being treated at the new facility. By day 28, the plant had achieved a target mixed liquor concentration of 2,000 mg/L, allowing full transition to the new system.

Since the startup, the facility has performed exceptionally well, consistently meeting and exceeding permit limits. This success is due not only to the design but also to the skill and dedication of plant staff.

Operator Jeff Wegner demonstrated outstanding capability in operating the new biological treatment system. Transitioning from a sand filter process to an activated sludge system required new licensing, extensive training,



Figure 4 Jeff Wegner receives WDNR Operator of the Year award

and a strong understanding of biological nutrient removal. His efforts were instrumental in achieving stable operations during startup and beyond.

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POP QUIZ!

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Optimizing Performance and Planning for the Future

Fine-tuning of the biological process further improved performance. Initially, both influent and RAS were directed to the first selector zone. Adjustments were made to route influent to the second selector while keeping RAS in the first. This configuration allowed denitrification to occur within the RAS stream before mixing with influent, giving phosphorus-accumulating organisms preferential access to the incoming substrate and improving biological phosphorus removal.

The plant has also achieved simultaneous nitrification-denitrification (SND) by maintaining relatively low dissolved oxygen (DO) levels in the oxidation ditch. This allows both processes to occur within the same basin, enhancing nitrogen removal efficiency. Careful control of aeration is essential: too much oxygen suppresses denitrification, while too little can hinder nitrification and phosphorus uptake.

Initially, aeration control relied on DO readings from the first-pass ring of the oxidation ditch. This resulted in

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WPDES Permit		Monthly Averages (mg/L)
BOD	May-October	15
	November-April	20
TSS	May-October	16
	November-April	20
Ammonia	April	29
	May-October	7.3
	November-March	21
Phosphorus	January-December <i>Monthly Mass Requirements</i>	1.0
e.Coli	May-September	126#/100mL

Table 1 WPDES Permit Limits

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continued from page 13

fluctuating aerator speeds and inconsistent conditions entering the clarifiers. Shifting control to the second-pass ring stabilized system performance, resulting in more consistent DO levels and improved process reliability, while also promoting anoxic conditions favorable for nutrient removal.

Performance improvements compared to the previous facility have been substantial.

Parameter	Previous Removal	Current Removal (2025)
BOD	90%	99%
TSS	94%	99%
Ammonia	3%	99%
Phosphorus	11%	88–93%

Table 2 Historical versus current pollutant removal

Efficiency

A temporary disruption occurred in April 2025 due to an industrial discharge containing surfactants, which caused a die-off of phosphorus-accumulating organisms and required



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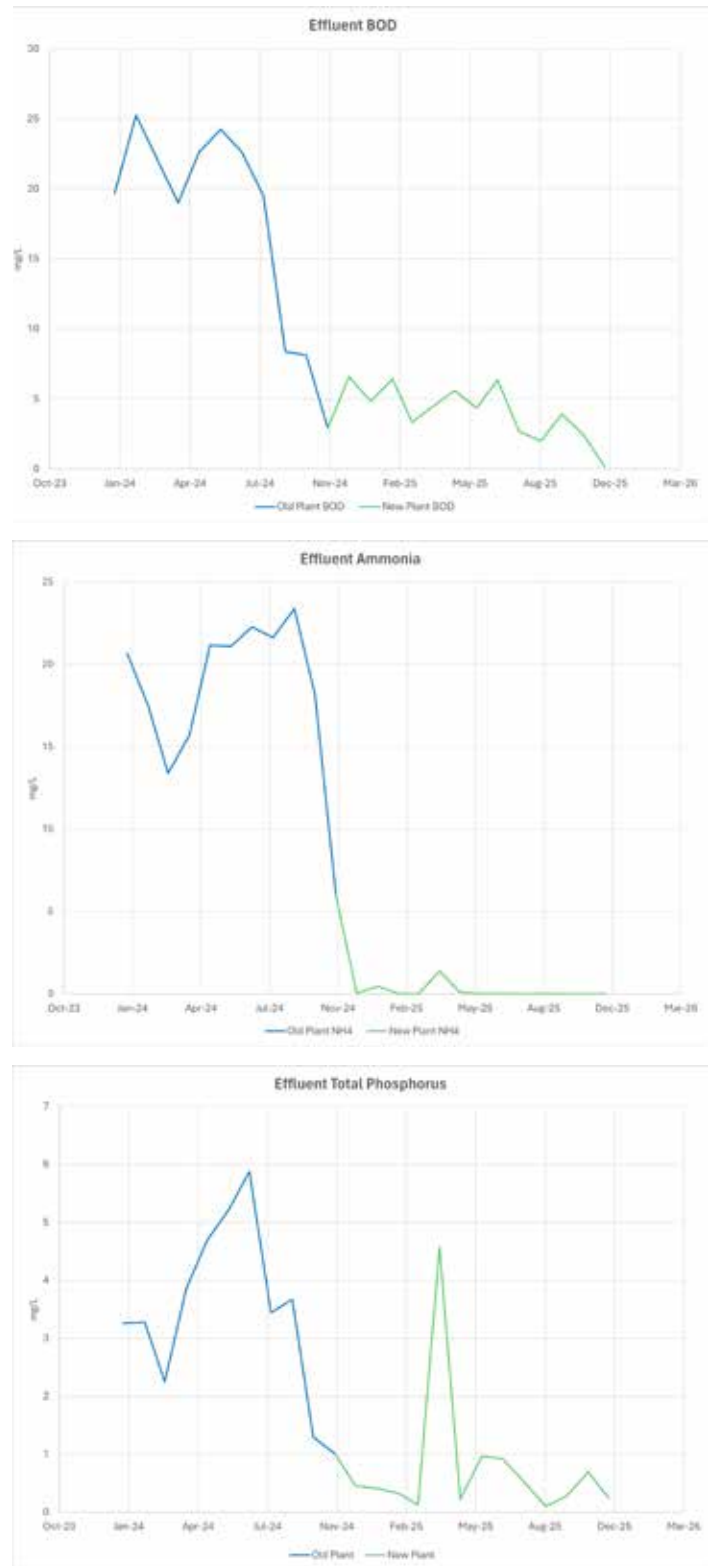


Figure 5 Effluent discharge performance

reseeded. Aside from this isolated incident, phosphorus removal has remained strong and is achieved almost entirely through biological means, reducing chemical usage and saving the Town approximately \$15,000 annually.

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The impact of the new facility extends beyond compliance and performance. Under the previous system, limited treatment capacity required Ixonia to restrict development. With the new plant in operation, the Town is now positioned for growth, ready to support new industries and residents while maintaining a high standard of effluent quality. 🌱



Figure 6 Sunrise over the Ixonia oxidaton ditch

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WVOA Sporting Clays Triathlon

There are three WVOA shoots throughout the year.

Participation in all three events qualifies shooters for special awards presented at the Annual Conference.



2026 Triathlon Events

**Spring Sporting Clays
Wild Wings — April 30**

**Ryan Geifer Memorial Shoot
Wausau — July 9**

**Annual Conference Shoot
October 13 — Brillion**

Questions?

Ben Propson, Village of Kewaskum
bpropson@
village.kewaskum.wi.us 🌱



WWOA AWARD NOMINATION FORM

Deadline: Thursday, July 23, 2026

1. Check Award Nomination:

Bernauer Crabtree Albers-Templeton Service Newcomer of the Year

Regional Operator (regional affiliation) _____

2. Nominee's Information:

Nominee's Name _____ Address: _____

City: _____ State: _____ Zip: _____

Home Phone: _____ Work Phone: _____

Employer: _____

Occupation/Job Title: _____

Date Joined WWOA: _____ WWOA Membership Number: _____

Regional Affiliation: _____ Regional Officer Position(s) _____

3. Brief Description of Nominee Activities and Achievements: (attach sheets if needed)

4. Why Do You Feel Nominee is Deserving of the Award? (attach sheets if needed)

5. Please Complete the Following:

Submitter Name: _____

Address: _____ City: _____

State: _____ Zip: _____

Regional Operators awards contacts are the regional chairs unless otherwise noted:

*Lake Michigan
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dschaefer@sehinc.com*

*North Central
Pat Morrow
PMorrow@msa-ps.com*

*Northwest
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*Southern
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mcastillo@msa-ps.com*

*Southeast
Emily Nurmi
emily@williamreidltd.com*

*West Central
Joe Intihar
jintihar@hudsonwi.gov*

The regional awards committees are to forward the selected nominee to **Jenny Pagel** jpapel@harrison.wi.gov by **July 23, 2026** for approval by the board.

Please email nomination forms – For Bernauer, Service, Crabtree, and Newcomer of the Year to:

Jenny Pagel – President Elect
Email: jpapel@harrison.wi.gov

WWOA annual awards nominations criteria

Celebrate the outstanding work of your fellow operators and WWOA members by submitting a nomination for this year's Annual Awards. These honors recognize excellence and dedication within our industry and will be presented at the annual WWOA Conference in Green Bay, Wisconsin.

Nomination forms can be found on the WWOA webpage. <https://www.wwoa.org/events-awards/annual-awards>

Nominations are due by July 23, 2026 so don't miss out on the opportunity to recognize that someone who is making a difference!

George F Bernauer

Criteria include successful plant performance, and/or successful solution of important or complicated operational problems, and/or outstanding contributions in the field of wastewater technology in the State of Wisconsin. The nominee may be a municipal, industrial, or institutional operator, administrator, or educator in Wisconsin. It is not limited to WWOA members. Members currently serving on the Board of Directors are not eligible to receive this award.

Award includes a plaque, framed certificate, and complimentary banquet dinner ticket and hotel accommodations for the evening of the banquet (if needed).

NOTE: The person who nominated the award recipient is responsible for letting the Executive Secretary know if the award winner needs a hotel room for the evening of the banquet.

Albers-Templeton Service Award

Presented to a person who has made an outstanding contribution to the WWOA in the areas of promotion, operation, management, program participation, or education. The nominee must be an active member of WWOA for a period of at least ten years. Members currently serving on the Board of Directors are not eligible to receive this award.

Award includes a plaque, framed certificate, and complimentary banquet dinner ticket and hotel accommodations for the evening of the banquet (if needed).

NOTE: The person who nominated the award recipient is responsible for letting the Executive Secretary know if the award winner needs a hotel room for the evening of the banquet.

Koby Crabtree Research & Education Award

Awarded to a WWOA member for excellence in technical support provided to others in the field of wastewater treatment. The individual should be a recognized authority in wastewater, share knowledge through presentations, contribute to problem solving, and provide service regardless of compensation. Members currently serving on the Board of Directors are not eligible to receive this award.

Award includes a plaque, framed certificate, and complimentary banquet dinner ticket and hotel accommodations for the evening of the banquet (if needed). NOTE: The person who nominated the award recipient is responsible for letting the Executive Secretary know if the award winner needs a hotel room for the evening of the banquet.

Newcomer of the Year


Recognizes an operator, support staffer, or environmental technician with less than three years of experience as of August 1st of the year nominated. The nominee should demonstrate higher than average growth in their place of employment, a willingness to learn, innovation on the job, and exceptional enthusiasm for their profession. The nominator should be a supervisor, manager, peer, co-worker, or DNR personnel familiar with the day-to-day efforts of the nominee. WWOA membership is not required, and a one-year membership or renewal is included in the award. Members currently serving on the Board of Directors are not eligible to receive this award.

Award includes a plaque, framed certificate, and complimentary one-year membership to WWOA.

Regional Operator of the Year Awards

Given to someone who has demonstrated excellent plant performance, and/or successful solution to a problem, and/or contributions to the wastewater field. It is open to Wisconsin operators of municipal, industrial, or institutional wastewater treatment facilities. Operators may or may not be Certified.

Eligible candidates include those working in a variety of areas, including general plant operations, biosolids, collections, engineering, lab operations, maintenance, etc. The nominee must be at least a five-year member of WWOA.

Award includes a plaque and a framed certificate. 



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PLAN AHEAD FOR THE 2027 YOUTH APPRENTICESHIP PROGRAM



The Wisconsin Wastewater Operators Association Youth Apprenticeship Involvement Grant is designed to help **offset a portion of apprentice wage costs** — not fully fund a position.



Utilities and municipalities interested in participating in 2027 are encouraged to begin budgeting and planning now.



FACILITIES THAT PLAN AHEAD ARE BEST POSITIONED TO SUCCEED.



Funding is limited and competitive.



Staff mentorship and training time should be considered.



Local budget support is essential for participation.



Commitment today leads to a stronger workforce tomorrow.



INVEST IN THE NEXT GENERATION OF OPERATORS TODAY.



More information on the 2027 WWOA Youth Apprenticeship Involvement Grant Program will be released in the coming year.

Wisconsin sewer user charge report provides insights toward the cost of clean water

Pat Morrow, PE, Wastewater Senior Team Leader at MSA

In 2025-2026, MSA conducted its 11th Wisconsin Sewer User Charge Survey — a project that involved sending 814 questionnaires to Wisconsin WPDES permit holders to collect and analyze data related to community size, sewer rates, and wastewater treatment system type. This survey has been completed approximately every three years since 1996, with this latest iteration garnering a nearly 29% response rate (239 participants).

Throughout the years the questions posed in the survey have been modified to further identify and evaluate trends in the data — ranging from the treatment technologies commonly in place for given sized communities to the number of years that have passed since the last major facility upgrade occurred. Ultimately the goal of the survey and accompanying report is to provide data-driven answers so that municipal leaders and utility departments have a candid, comparative analysis of sewer rates across the state. Furthermore, to provide supporting background

information to help explain why sewer rates may differ significantly among similar-sized or neighboring communities, sanitary districts vs. villages vs. cities — due to economies of scale — and regional customers vs. treatment facility owners, or certain regions within the state. This can be an important tool when applying for funding to support wastewater upgrades and can provide residents with peace of mind when explaining the need to introduce new rate increases.

So, what does the survey reveal?

Rates continue to steadily increase

Since the first survey was conducted in 1996, the average cost for residential sewer service has been consistently increasing. A number of factors contribute to this. The rising cost of electricity, fuel, chemicals, and labor, for one. But also, the new and larger debt payments municipalities

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must make on capital improvements to replace aging infrastructure and meet stricter environmental standards. The chart below shows the continual increase in average cost for residential sewer service across all population ranges — and as a statewide average — with each bar on the graph representing one of the 10 past Sewer User Charge Surveys conducted. Note, Figure 1 is based upon an annual water usage of 55,000 gallons per year, which was a historically accepted water usage rate among some regulatory agencies. However, each edition of the survey has shown that water usage continues to decrease and drift farther from the 55,000 gallon-per-year benchmark. This will be discussed in further detail later in this article.

The 2025 Sewer User Charge Survey found the average cost for residential sewer service statewide to be \$550 per year (\$137.39 per quarter or \$45.80 per month) based upon actual water use. Based on the common benchmark water usage of 55,000 gallons per year, the 2025 statewide average is \$698. This represents an increase of 6.8% per year since 1996 when this benchmark was first introduced into MSA's Sewer User Charge Survey report.

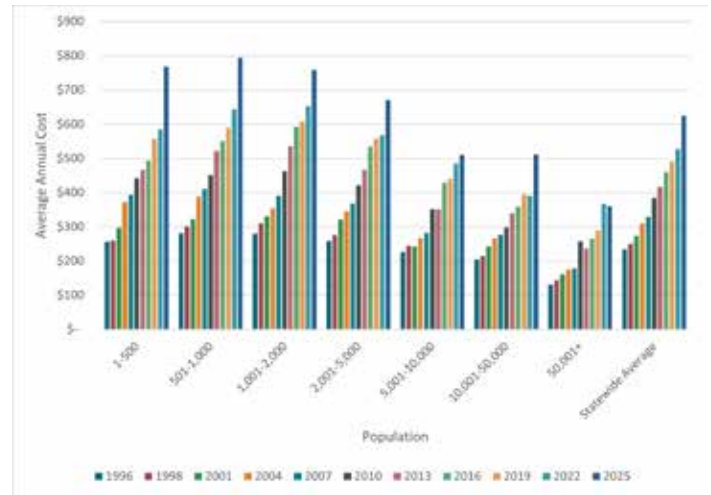


Figure 1: Average annual residential sewer charges, by population range, based on 55,000 GPY use (1996-2025)

Smaller communities are paying more

While the average cost of residential sewer service varies significantly within the various population groups, people in smaller communities tend to pay more. This has been largely the case since these surveys began. The problem is that smaller communities are required to meet the same new and stricter regulations as larger cities yet lack the user base to fund projects without more significant impacts to sewer rates. As a result, residents in small communities often face disproportionately higher costs because there are fewer people to share the financial burden. Results show that the greatest variability of cost occurs within the 1-500 population range, and the least amount of variability occurs in the 50,000+ population range, which is depicted in Figure 2.

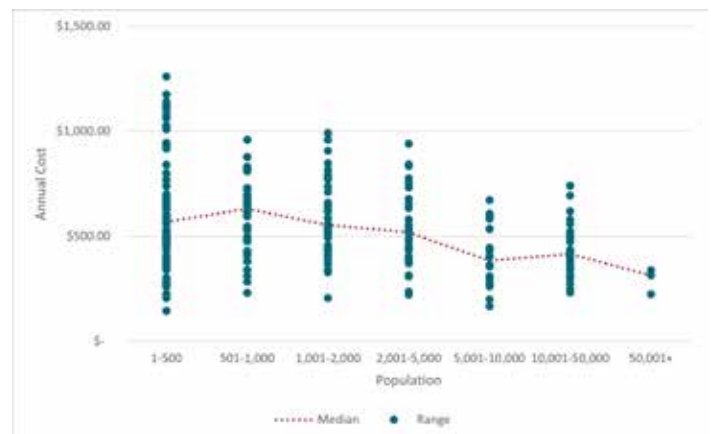


Figure 2: Annual sewer charges and median, based on actual use, by population range

Sewer rates in comparison to household income

Figure 3 provides median household income (MHI)

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values for the various population groups considered in the survey, and Figure 4 presents sewer rates as a percentage of

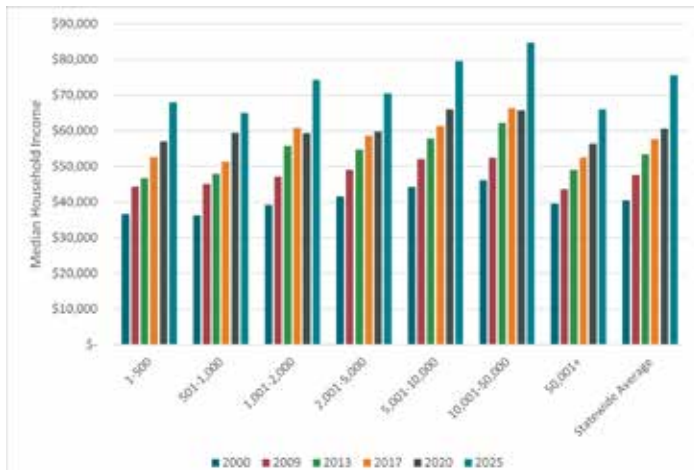


Figure 3: Average median household income (MHI), by population range (2000-2025)

household income. While both MHIs and sewer rates have steadily increased over time, the average cost for residential sewer service as a percentage of MHI is generally declining for all population ranges. This is because median household incomes continue to rise at a faster rate than sewer rates.

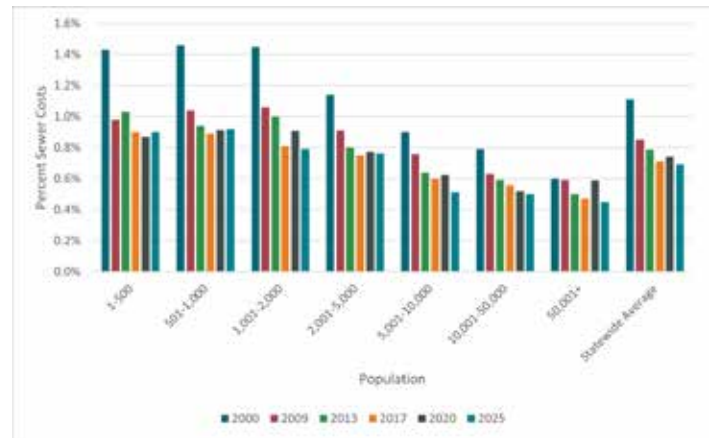


Figure 4: Average cost for residential sewer service as a percentage of MHI, by population range, based on actual use (2000-2025)

The potential takeaway here is that municipalities could take this into consideration when identifying whether rate increases are needed and determining the size of rate increases. Implementing a policy of gradual rate increases that track with MHI increases could help establish capital improvement funds and lessen the sewer rate impacts when wastewater system upgrades are needed. A final consideration is that Wisconsin has a statutory threshold that identifies economic hardship considerations when the sewer rates reach 2% of the MHI. While there are individual

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communities within the state whose sewer rates are at or very close to the 2% threshold, the average sewer rates are significantly lower.

Water use is declining

As mentioned previously, actual water usage continues to drift away from the historical benchmark annual water usage of 55,000 gallons per year, as water use is largely in decline. Water use trends are shown in Figure 5. The primary reason for this trend is believed to be rooted in lower-flow, higher-efficiency plumbing fixtures coupled with improved public perceptions favoring water conservation. While this is a good thing from an environmental and conservation perspective, it is also very much a double-edged sword. The sewer rates in most communities are comprised of both a fixed-fee component and a variable, volume-based component. As such, sewer revenue depends upon water usage. It is a common observation that after a significant sewer rate increase, water usage will decrease. And as usage drops, sewer utilities may need to further increase rates to make up for lower than anticipated revenue.

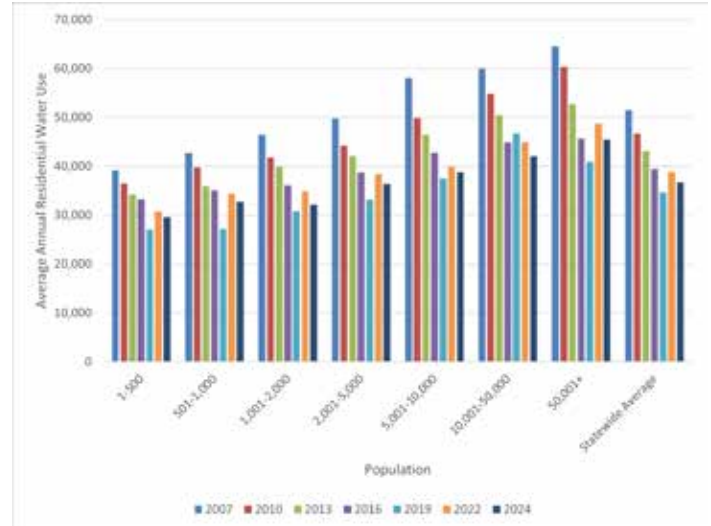


Figure 5: Average annual residential water use, by population range (2006-2024)

Rate increases are becoming more frequent

The 2025 Sewer User Charge Survey found that statewide, the median number of years since the last sewer rate increase is approximately 1.4 years; however, the average number of years since the last sewer rate increase is 3.1 years. Furthermore, the data indicates the average number of years since the last sewer rate adjustment has decreased across all population ranges as compared to the 2022 survey. A total of 49% of the survey respondents indicated a sewer rate increase will be necessary within the next year, with an average anticipated rate increase of 11%.

Sewer rates may not reflect the true value of service

It also appears that sewer rates don't often reflect the true value of the service provided. Clean water and safe drinking water have historically been undervalued and underprioritized, even though they are integral to public health and safety. Elected officials, city councils, and utility boards take great pride in keeping water and sewer rates as low as possible, but this may have unintended, negative consequences. Maintaining a stagnant rate structure can do communities a great disservice when upgrades are needed and they must ask residents for a 20%, 30%, 60%, or more increase. Providers of other basic services such as natural gas, cable TV, electricity, or internet increase rates on a frequent basis without a second thought. Rationale for periodic, frequent rate increases are to keep pace with inflation, set aside funds for future equipment replacements or improvements, fuel costs, increased cost of labor, etc.

While residential sewer rates do continue to trend upward, by comparison with other household utilities, wastewater service remains one of the least-costly utilities in the average

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home. Naturally, the costs for these services varies as well depending on location, options, or monopolies of service providers. But it provides a bit of context around today's sewer rates and what the average consumer pays for the comforts and conveniences of home. Figure 6 provides this comparison of sewer and water rates to other common monthly expenditures and utilities.

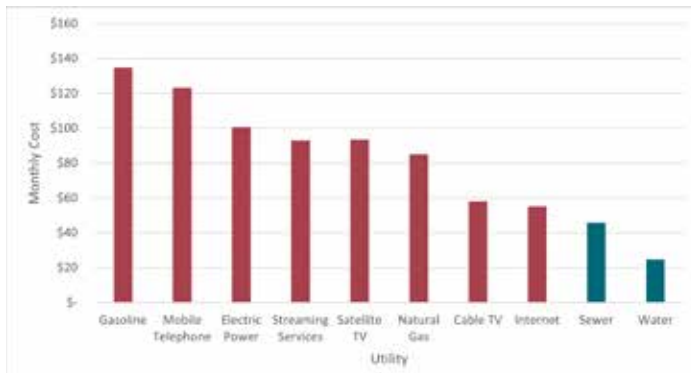


Figure 6: Estimated average monthly cost of various utilities

The “Cost of Clean” bottom line

The Wisconsin Sewer User Charge Survey Report is

intended to be a comprehensive guide to sewer user rates across the state. It is meant to assist municipal leaders and utility departments with assessing their own rates against communities of similar size and treatment technology type, with the goal of helping to successfully plan, fund, and implement wastewater infrastructure upgrades.

The 2025 Wisconsin Sewer User Charge Survey Report was made available to participants who completed the survey. For those who did not elect to participate, interested parties can email ratesurvey@msa-ps.com for more information.

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December	November 13

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2026 Operator competition field day a success

The Wisconsin Wastewater Operators Association (WWOA) successfully hosted its first-ever Operator Competition Field Day on April 28, 2026, at NEW Water in Green Bay, Wisconsin. The hands-on “show and tell” event brought together wastewater professionals from across the state for a full day of learning, collaboration, and friendly competition preparation.

Designed to introduce members to the Operator Competition experience, the event provided attendees with an in-depth walkthrough of every competition event from start to finish. Participants learned detailed rules, scoring procedures, and common penalties while watching live demonstrations led by experienced competitors and judges.

The event saw operators from Whitewater, Racine, Veolia, NEW Water, Fond du Lac and South Milwaukee, as well as support from Borger, Mulcahy Shaw Water and Flygt/Xylem.

One of the highlights of the day was the opportunity for attendees to participate in a real-time competition run that was timed, judged, and scored just like the official event.

The interactive format helped create a supportive learning environment and removed much of the intimidation factor often associated with joining an Operator Competition team for the first time.

Judges were present throughout the day to offer guidance, answer questions, and share valuable insight from previous competitions. With attendance capped at 24 participants, the event encouraged meaningful interaction and hands-on engagement for everyone involved.

Attendees also earned 6 WDNR credits for participating in the training opportunity. Snacks were donated by Borger, and lunch was generously sponsored by Flygt, helping make the free event even more enjoyable.

The 2026 Operator Competition Committee hopes the success of this inaugural Field Day will inspire greater participation and excitement leading up to the WWOA 60th Anniversary Conference Operator Competition later this year, and for years to come. Next year, WWOA plans to host 2 of these events, with one likely in mid-winter, and one mid to late spring, with a northern and southern location TBD. 🌐



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Janesville Wastewater hosts May 7 Southern District meeting

The city of Janesville hosted a meeting at the newly constructed Woodman's Sports & Convention Center for the classroom portion and an Ops to Ops style meeting at the Janesville Wastewater Utility. The meeting included 72 attendees and 12 vendors. The meeting portion began with a welcome from Janesville city manager Kevin Lahner.

The first education portion was presented by Richard Douglas (WI DNR) on Working with Industrial Dischargers & Industrial Pretreatment Program Update. The session included a discussion on Electroplater and Metal finisher coverage, Significant Non-Compliance (SNC) Evaluation, Composite sampling clarifications, Regulatory Climate,



Richard Douglas

Regulatory Changes, Federal impact on Wisconsin DNR, Contaminants of concern, and Working with Industrial Dischargers. Richard had noted that SNC is mostly completed every 6 months, but should be evaluated quarterly. Publishing is required annually, and should be consistent to time of year. Regulatory climate have noted finalization of guidelines and standards for steam electric power, and upcoming changes to oil and gas. Richard went on to discuss the importance of having meaningful relationships between Control Authorities and Industrial Users with consistent education and general discussion on enforcement and review.

The next presentation was provided by Nate Willis (WI DNR) on DNR PFAS regulatory updates. Nate discussed the recent updates to Act 201, interim strategy updates, and data for PFOA/PFOS in sludge and effluent data currently collected and submitted to the DNR. Act 201 was signed into law on 4/6/2026 and creates ~\$80m in PFAS community grant funding, \$5.2m in Airport and Industrial processor PFAS grant program, and \$35m in Expanded Well Compensation grant programs. Additionally Act 201

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Nate Willis

directs the DNR to create a general WPDES permit to cover all sewerage sludge generators which do not currently have PFAS requirements in their individual WPDES permit. The general permit is open for public comment from May 1st 2026 to June 1st 2026 with an informational hearing on June 9th 2026 with the permit going into effect July 1st

2026. Additional information about required sampling can be found on the DNR website.

Following a break for lunch Rick Treleven (BCR Solid Solutions) gave a presentation on biosolids drying and PFAS/PFOA chemical destruction technologies. Rick discussed the many benefits of drying cake solids including



Rick Treleven

volume reduction and achieving Class A biosolids. The presentation concluded with results of PFAS/PFOA reduction through Pyrolysis of undigested dried biosolids.

The classroom portion was then concluded with the WI DNR update and WWOA southern district meeting. Scot Truesdill then provided an overview of the Janesville WWTP. Scot Truesdill and Janesville operators were stationed throughout the plant to discuss equipment including Saveco Fine Screens, Smith & Loveless PISTA Grit removal, Huber Grit Classifier, Fermentation Tanks, Velodyne Polymer Feed, Whatson Marlow Peristaltic Pumps, Centrisys Centrifuge Dewatering, Solids storage, and Ozonia UV. Additionally, a station was included for discussing the operators competition area.



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July 2
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July 9
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July 23
Deadline for WWOA Annual Award Nominations

July 30
Northwoods Collection System Seminar

August 5 and 6
Wastewater Microbiology and Microscopy Workshop



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Look for more information in the September issue of *The Clarifier*. 📖

An advertisement for Staab Construction. The background is a large image of a wastewater treatment plant. Overlaid on this are three circular inset images: a service truck, a worker on a pipe, and workers in a trench. A dark grey rounded rectangle contains a list of services. At the bottom, there is a logo for Staab Construction, a contact button, and contact information.

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Ask the DNR: You have questions, we have answers...

By Ben Hartenbower, PE, DNR staff

How are Water Quality Based Effluent Limit (WQBEL) recommendations determined?

Section NR 205.067(1)(a), Wis. Adm. Code, states that the department shall include an effluent limit when it is determined that the discharge causes, has the reasonable potential to cause, or contributes to an excursion above the allowable ambient concentration of a numeric water quality criterion in the receiving water. So, if the concentration of a pollutant in the wastewater effluent is close enough to or exceeding the calculated limit for that pollutant (and shows reasonable potential), the limit will need to be included in the next permit.

How is “reasonable potential” determined?

Wisconsin Administrative Code designates three ways in which reasonable potential can be determined. One of these ways is using the P-99 which is an estimate of the upper 99th percentile of a lognormally distributed dataset. With a given number of discharge concentrations used to calculate the average of a specific monitoring period (1-day = daily, 4-day = weekly, and 30-day = monthly), the concentration that would be exceeded 1% of the time can be determined. If this value is greater than the calculated WQBEL, reasonable potential is triggered and the WPDES permit will include the limit. For a statistically valid calculation, at least 11 detected samples are required. What is meant by “detected” is that the sample result is greater than the limit of detection (LOD) indicated on the lab report. If some of the sample results are below the LOD, the results will still be included in the full dataset, but the department may require additional samples until at least 11 detected results are available.

Why aren't 11 sample results required for every parameter in the permit application?

If 11 detected sample results are not available, the department may still determine reasonable potential using the arithmetic average of the available data. The trade off for this method is that, to rule out reasonable potential, the average would need to be less than 1/5th of the calculated limit, whereas the P-99 would be compared to the actual limit. This extra buffer factors in the uncertainty that comes with using a limited dataset. The calculated limit for many parameters may be far greater than the single result or dataset average, therefore the need for certain limits can be ruled out without the additional expense to get lab results to include 11 detects. Parameters that the department request extra sampling for may include metals (typically copper

or zinc) or chloride when the discharge is to a water body with little or no dilution (7Q10 = 0 cfs), or metals where the effluent hardness is low. If the department is requesting, but not requiring, that you take additional samples, it is often in your best interest to do so. This could mean avoiding a limit in your permit for a parameter.

Example: The application submitted from a facility required 11 copper results and 4 hardness results. The discharge is to a waterbody with a 7-Q10 of 0 cfs, so the criteria are equal to the calculated limits.

Sample Date	Copper (µg/L)	Effluent Hardness (mg/L)
2/3/2025	9.8	105
2/6/2025	10.7	110
2/10/2025	6.3	95
2/13/2025	<3	102
2/17/2025	5.4	
2/20/2025	8.8	
2/24/2025	4.8	
2/27/2025	7.2	
3/3/2025	<3	
3/6/2025	3.2	
3/10/2025	7.4	
mean	6.0	103 (geomean)
1-day P-99	N/A	
4-day P-99	N/A	

“<” means that the pollutant was not detected at the indicated level of detection (LOD). The average concentration was calculated using zero in place of the non-detected results a hardness of 103 mg/L (the geometric mean of the 4 sample results), the calculated daily maximum limit is 16 µg/L, and the calculated weekly average limit is 11 µg/L.

Using a hardness of 103mg/L (the geometric mean of the 4 sample results), the calculated daily maximum limit is 16 µg/L, and the calculated weekly aferage limit is 11µg/L.

Daily Limit Calculations:

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		339.8		340	68	1.6		
Cadmium	103	10.65	0.009	11	2.2	0.3		
Chromium (+3)	103	1845.1	0.622	1845	369	1.5		
Copper	103	15.93	1.265	16	3.2	6.0		10.7
Lead	103	109.87	0.178	110	22	2.2		
Nickel	103	480.48		480	96	5.2		
Zinc	103	123.38	1.71	123	25	20		
Chloride (mg/L)		757	28	757	151	70		

Weekly Limit Calculations:

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD. mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152.2		152	30	1.6	
Cadmium	103	2.52	0.009	2.52	0.50	0.3	
Chromium (+3)	103	135.19	0.622	135	27	1.5	
Copper	103	10.6	1.265	11	2.2	6.0	
Lead	103	28.78	0.178	29	5.8	2.2	
Nickel	103	53.45		53	11	5.2	
Zinc	103	123.38	1.71	123	25	20	
Chloride (mg/L)		395	28	395	79	70	

Since the dataset only includes 9 results greater than the LOD of 3 µg/L, the arithmetic mean must be compared to 1/5 of the daily maximum (16/5 = 3.2) and 1/5 of the weekly average (11/5 = 2.2). With the given information the effluent has the reasonable potential to cause an excursion above the allowable ambient concentration of a numeric water quality criterion. Therefore, a daily maximum limit

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of 16 µg/L and weekly average limit of 11 µg/L would be required.

If the department receives two more copper results greater than the LOD, we have the following dataset.

Sample Date	Copper (µg/L)
2/3/2025	9.8
2/6/2025	10.7
2/10/2025	6.3
2/13/2025	<3
2/17/2025	5.4
2/20/2025	8.8
2/24/2025	4.8
2/27/2025	7.2
3/3/2025	<3
3/6/2025	3.2
3/10/2025	7.4
4/10/2025	6
4/13/2025	4.8
mean	6.7
1-day P-99	13.6
4-day P-99	10.4

Daily Limit Calculations:
RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		339.8		340	68	1.6		
Cadmium	103	10.65	0.009	11	2.2	0.3		
Chromium (+3)	103	1845.1	0.622	1845	369	1.5		
Copper	103	15.93	1.265	16	3.2	6.7	13.6	10.7
Lead	103	109.87	0.178	110	22	2.2		
Nickel	103	480.48		480	96	5.2		
Zinc	103	123.38	1.71	123	25	20		
Chloride (mg/L)		757	28	757	151	70		

Weekly Limit Calculations:
RECEIVING WATER FLOW = 0 cfs. (1/4 of 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152.2		152	30	1.6	
Cadmium	103	2.52	0.009	2.52	0.50	0.3	
Chromium (+3)	103	135.19	0.622	135	27	1.5	
Copper	103	10.6	1.265	11	2.2	6.7	10.4
Lead	103	28.78	0.178	29	5.8	2.2	
Nickel	103	53.45		53	11	5.2	
Zinc	103	123.38	1.71	123	25	20	
Chloride (mg/L)		395	28	395	79	70	

With the addition of these two additional detected sample results for copper, the 1-day P-99 can be calculated for comparison with the daily maximum limit of 16 µg/L and the 4-day P-99 can be calculated for comparison with the weekly average limit of 11 µg/L. With this additional data, there is no reasonable potential for the effluent to cause an excursion above the allowable ambient concentration of a numeric water quality criterion. Therefore, limits are not required in the reissued permit. In some cases, it may be recommended to include enough copper monitoring for at least 11 detects throughout the permit term to avoid this scenario with the next permit application.

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Central Waters Brewing and Village of Amherst WWTF host April North Central District meeting

North Central Regional meeting: 4/7/26

Kick off meeting

Pat Morrow, MSA Professional Services, Inc.

Pat Morrow gave a presentation on trends in sewer rates in Wisconsin. MSA sent out a survey and received 208 responses. This was a 30% response rate. The trend in the surveys shows that smaller communities pay more than larger communities. The survey also shows that overall rates are continuing to go up; however, the trends of the graphs stay the same year after year. Very small communities have a lot of fluctuation due to whether or not there was a recent upgrade, which can make rates rise quickly. Rate increases are becoming more prevalent within recent years. The statewide average shows a reduction in water usage. The average cost of residential sewer service is \$564 per year. There has been an increase in sewer rates of 5.8% per year in the past 25 years.

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Charlie Dierks, Aquachem of America, Inc.

Aquachem works with municipal and industrial plants providing chemicals like polymers for sludge thickening, phosphorus removal, and bio-augmentation to help improve plant efficiency and deal with issues such as FOG or sludge removal in lagoons. He explained that the cost of ferric chloride skyrocketed since Covid and other products became a lot more cost effective, like ferric sulfate. Global markets and politics play a huge role in the cost of materials, which ultimately affects the cost of the chemicals that plants use. The biology side of chemical addition is becoming a bigger topic, especially in the industrial market. It provides a better alternative to dumping chemicals into a system to solve a problem.

ECT2: Emerging compound treatment technologies

Nicholas Bachman, ECT2

Nick Bachman presented on technology solutions for removal of emerging and difficult-to-treat contaminants, focusing on two alternatives:

NanoSORB – An alternative to granular activated carbon. It uses less space and is more effective at removing PFOA/PFOS. You need a biological treatment system such as activated sludge to put the product in and incorporate it into your sludge.

Fluor-X – A chemical floc that works on the sidestream WAS line to return the water 90% PFOA/PFOS free.

Nick Lindstrom provided the DNR update

- Bill signed 4/6/26 to phase out nonessential PFAS uses within 10 years
- Designated Signatory Authority forms – someone responsible for the operations of the facility can fill these out, rather than the Mayor of a City.
- WET testing - Andrea Gruen is the new coordinator; new WET report submittal address
- RMB Environmental Labs, Burnsville, MN - newly certified wet lab in the state
- New guidelines permitting the use of dyes in Wisconsin have recently been finalized.
- Flow meters-Recommended to test more than one point. Not just the middle. Do the high and low range at repetition.

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- Make sure chemicals are in secondary containment. DNR will be focusing on this in their inspections
- CMARS-coming out April 30th

Mike Olsen, Visu-Sewer

Mike Olsen from Visu-Sewer spoke about sewer rehabilitation. He stressed the importance of proactive maintenance such as cleaning and inspection to minimize emergencies. He explained some of the grouting techniques to seal cracks from laterals and mainlines and how they can fix them from the surface, instead of having to dig and replace. He spoke about the feasibility of lining mainlines and that manholes can be lined as well. There are different types of materials like cementitious and epoxy liners used to coat manholes depending on things like H2S levels. 🌐



Mike Olsen

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2026 15th Annual WWOA Spring Sporting Clays

Record Attendance of 102 Shooters!

WWOA held its annual Spring Sporting Clays shoot on April 30th at Wild Wings Sportsman Club in Campbellsport, WI. This year smashed the previous attendance record of 83 with 102 shooters participating! This rapid growth has allowed us to permanently modify our schedule to allow participants to head right out to the course as they arrive. As our industry is accustomed to, we adapt when needed. This worked great as everyone was back in the clubhouse by 2pm and ready for the door prizes to be drawn. Once again, with the donations of the many Vendors and consultants that support our organization, we were able to provide at least one door prize to everyone who participated. New this year the first ticket that was drawn was put in a sealed envelope and opened at the end of the drawing for the top prize. Let's just say this caused emotions to run wild when we got close to the end of names in the bucket. We also gave out prizes to the top three shooters.



Top shooter Adam Clark, Stevens Point

This year's top shooter was Adam Clark from Stevens Point with a 49 out of 50 targets broke. Second place was a tie at a score of 48 between Dustin Beckman and Brad Behringer.

As always, the tremendous support from many of our industry vendors helped to provide some fantastic door prizes. Their continued support has no doubt pushed these events to the level of participation we are seeing. After the shoot, the clubhouse was filled with Operators from entry level to managers, vendors, and engineers sharing stories and experiences. The networking these WWOA events are providing was on full display.

This year's events are just getting started. In its 3rd year is the WWOA Sporting Clays Triathlon. Participation in all three WWOA sporting clay events qualifies shooters for

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awards to be given out at the fall conference. The shooter with the top cumulative score from all three events will also be crowned the Triathlon Champion and have their name added to the plaque that is displayed at the fall conference event.

The next event is the Ryan Giefer Memorial shoot held in Wausau on July 9. This is a very fun course to shoot, and I would highly recommend adding it to your calendars. The WWOA events website has details.

The final shoot of the year will be held on Tuesday October 13th at Tripple J Wing & Clay in Brillion. This is a great kick off to our fall conference in Green Bay.

Thanks again to all who participated and assisted in the Spring shoot and made it a record setting event. I look forward to seeing everyone at the July shoot! 🍷

Ben Propson
Village of Kewaskum



about the Sportsman's board

Have a picture for the Sportman's board?

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

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

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