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MARCH 2024

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ON THE COVER: He was quiet, humble and self-deprecating, but at the same time a confidence builder for his community. The late John Hodge, superintendent of the Spencer (Indiana) Sewer Department, rebuilt customer faith in the plant after effluent violations and reporting errors and mentored young apprentices coming into the profession.  
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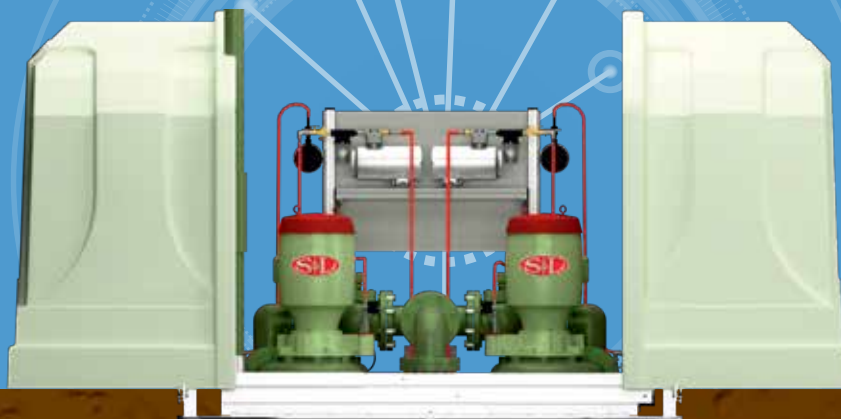
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let's be clear

## When You Become the Boss

STEPPING UP TO A SUPERVISORY ROLE IS MORE COMPLICATED THAN IT SEEMS. IT MEANS A NEW APPROACH TO WORK AND A CHANGED RELATIONSHIP WITH COLLEAGUES.

By Ted J. Rulseh, Editor



In the TV series *Band of Brothers* we learn that soldiers who got battlefield commissions were always assigned to a different unit from the one they served.

Why? Because suddenly becoming the superior of people who had been peers was simply too difficult a transition. It was better for the newly minted officers to be placed in charge of people they didn't know before.

There are no battlefield commissions in the water business, but as an operator you may one day win a promotion — to lead operator, plant supervisor, plant manager. Now, instead of being a friend and colleague to your team members, you're their boss. And that is a very big change, bigger than many who become bosses imagine.

### A TOUGH LESSON

I know this from hard experience. After four years as an account executive in a marketing communications agency, I was promoted to account supervisor and had two account executives reporting to me. I had earned the promotion by excelling as an AE. No one bothered to tell me that my new role meant something quite different: the care and development of my subordinates.

As a result, I struggled. I assigned two team members a major project and, intent on being the prototype hands-off manager, failed to offer counsel and advice along the way. The project went far over budget, and I got called on the carpet.

I had such a rough time that at one point I asked to be demoted to my old position. The request was denied; apparently my superiors preferred not to derail my career. Indeed, after a couple of years I did find my footing as a leader. But it wasn't easy.

### EXPERT ADVICE

Beyond learning the techniques of leadership and supervision, there's the matter of relating to the people on your team. The internet is full of advice on how to make a transition into leadership. Here is some advice gleaned from a variety of credible sources.

**Create some distance.** As the boss you are no longer just "one of the guys." SHRM (formerly the Society for Human Resource Management) advises separating personal and professional relationships: "You can remain friendly with former co-workers, but make it clear that personal relationships cannot and will not influence your decisions and actions at work. This separation may involve limiting or eliminating after-work socializing to avoid potential conflicts." It's unwise to be too personally close to people you may one day have to discipline.

**Keep in touch.** Writing in *Forbes* magazine, management expert Miriam Grobman recommends getting frequent feedback: "Regular one-on-ones will allow you to better understand the needs and concerns of each team member and build closer relationships." She also suggests checking in with your own boss "to see how you are doing and get practical advice on how to tackle managerial challenges."



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**Don't play the Big Boss.** Marta Simeonova, at the website [www.manage-to-soar.com](http://www.manage-to-soar.com), cautions against taking an overbearing stance. She notes that as a manager your job is to make sure your team members are achieving the expected results. "Being overly demanding and authoritarian will not bring you respect faster. It may make them fear you eventually (if that is what you want). But initially, you will most likely get quite a few laughs. You do remember how you used to mock managers who took themselves too seriously together, right?"

“Regular one-on-ones will allow you to better understand the needs and concerns of each team member and build closer relationships.”

MIRIAM GROBMAN

**Own your promotion.** Author and consultant Bruce Tulgan, writing in *Training* magazine, says to expect former peers to question why it was you who got the chance to step up. He observes, "When you get that promotion and all of sudden you are the new manager of your old team, you have two choices: behave in such a way that your former peers wonder why you are the new boss instead of one of them, or else do such a good job that nobody will ever wonder."

**Prepare in advance.** Business consultant Cheryl Grazier, writing on the Women's Leadership Today website, recommends learning about management leadership techniques even before taking on a leadership role. "Ask for formal training if available. Look for someone to coach you. By taking the time to learn and prepare, you will set the foundation for your new leadership position and guarantee yourself the ability to start your job as a new manager with an abundance of knowledge about how to be a good leader." **tpo**

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# Late to the Game

A LIFELONG LOVE OF THINGS MECHANICAL WAS JEFF MICHALAK'S TICKET TO A CLEAN-WATER CAREER. HE QUICKLY CAME TO LOVE HIS NEW PROFESSION.

STORY: **Betty Dageforde** | PHOTOGRAPHY: **Bryan Geiger**

**W**ith a degree in criminal justice and a work history in the casino industry, Jeff Michalak never imagined that in his mid-50s he would work in the wastewater treatment industry.

After all, he knew nothing about it. But in February 2021 he went to work at Douglas County's North Valley Wastewater Treatment Plant in Minden, Nevada, a small town 15 miles from Lake Tahoe. He needed a job, and the county needed someone with mechanical experience.

In 2023 Michalak won the New Wastewater Operator of the Year award from the Nevada Rural Water Association, which conducted many of the classes he took to earn his certification. "They probably got seeing me at all the classes because I needed so many hours," he laughs.

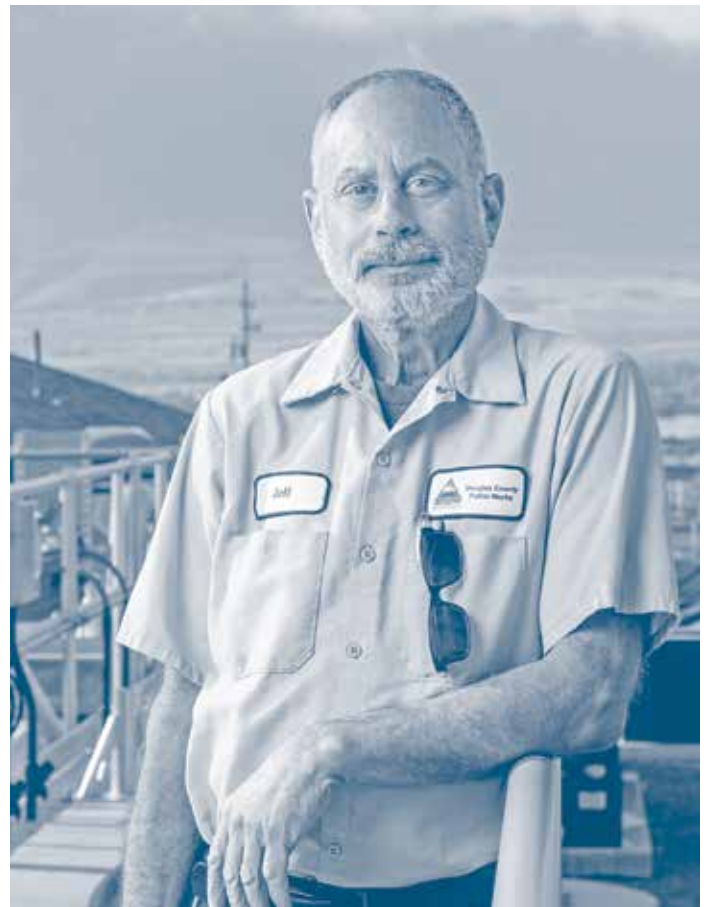
He received the award at the final luncheon at the NRWA convention: "I had no clue. I'm thinking, how do they even know I exist?"

## NO GOING BACK

Michalak is originally from Wisconsin. After earning a bachelor's degree in criminal justice from the University of Wisconsin-Platteville, he ran into a hiring freeze and a few other stumbling blocks when he tried to get a government job in his field. Eventually he decided to become a police officer.

He passed the physical agility and psychological tests and was finally accepted into the Criminal Justice - Law Enforcement Academy at Waukesha County (Wisconsin) Technical College. "But it was three months out," he says. "So that's when I went to Lake Tahoe on vacation." He never returned.

He was quickly hired by a casino and enjoyed a 28-year career in the industry, first in security, then running warehouse operations for three casinos and finally in convention services. Then COVID hit. "They closed the casinos for the first time in history and there was no convention business," Michalak says. "At first they put us on furlough, but the place was going broke, so then they fired us."



Jeff Michalak, wastewater treatment plant operator, Minden, Nevada

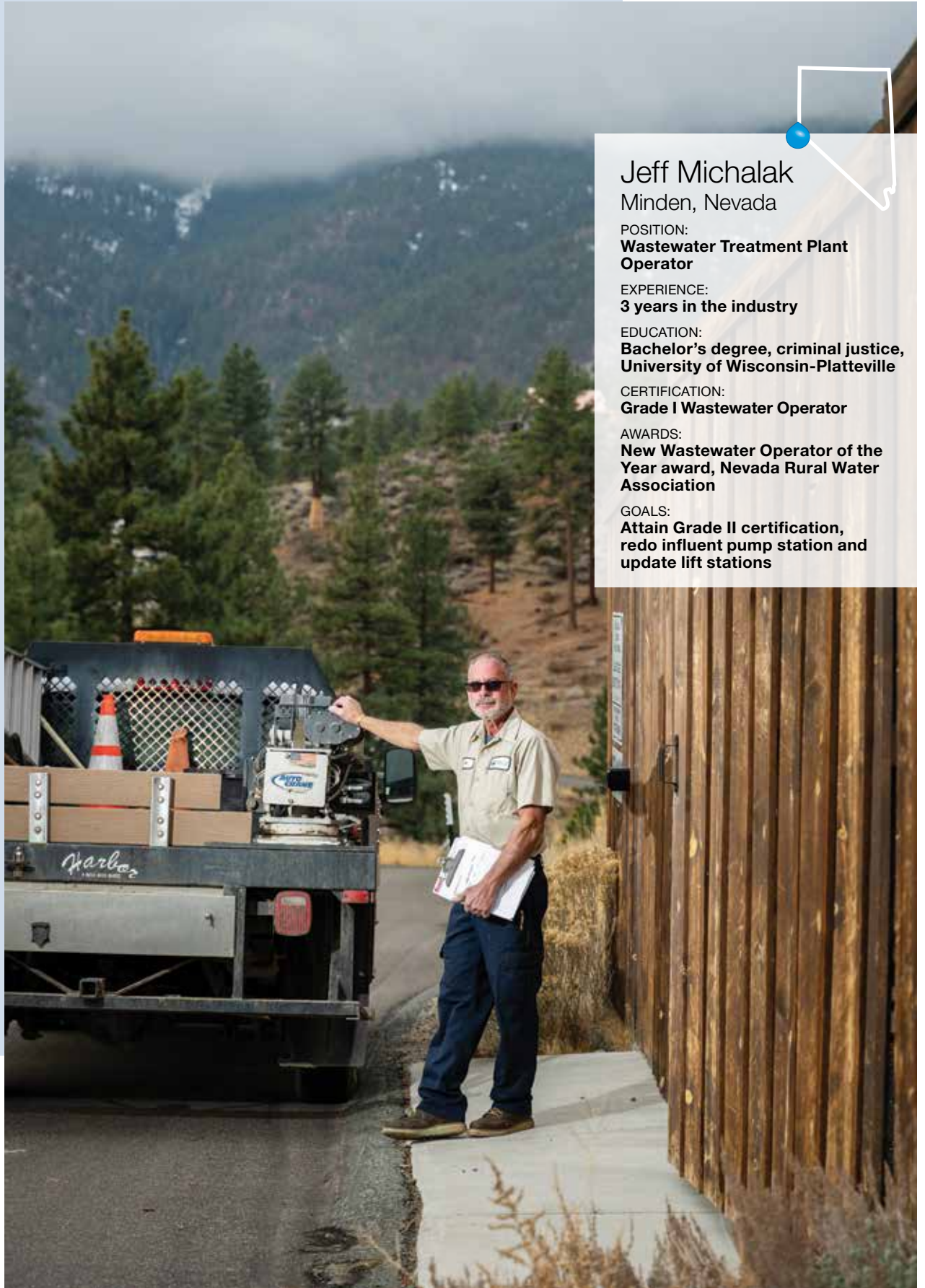
A lucky conversation with North Valley plant operator Tom Taflin, an acquaintance at the time, led to his new career. "He told me the treatment plant was going to be hiring, so I put in for the job and ended up getting it," Michalak says. His passion for mechanics was his ticket in.



“Being a mechanic is just being able to take things apart, figure them out and put them back together again. That’s something I had been doing my whole life.”

**JEFF MICHALAK**

Michalak won the 2023 New Wastewater Operator of the Year award from the Nevada Rural Water Association.



## Jeff Michalak

Minden, Nevada

**POSITION:**

**Wastewater Treatment Plant Operator**

**EXPERIENCE:**

**3 years in the industry**

**EDUCATION:**

**Bachelor’s degree, criminal justice, University of Wisconsin-Platteville**

**CERTIFICATION:**

**Grade I Wastewater Operator**

**AWARDS:**

**New Wastewater Operator of the Year award, Nevada Rural Water Association**

**GOALS:**

**Attain Grade II certification, redo influent pump station and update lift stations**



The Minden treatment plant has two basins designed to treat 0.9 mgd. Average flow is about 500,000 gpd.



Michalak, at the control panel for the headworks (Lakeside Equipment Corporation), got a late start in the clean-water profession but has found it rewarding.

“Being a mechanic is just being able to take things apart, figure them out and put them back together again,” he says. “That’s something I had been doing my whole life.” That was the easy part of the job. The hard part was learning the biology and chemistry. He had one year to get his certification.

### OFFICIAL RECOGNITION

While working on his contact hour requirements, Michalak began his education process. “I went to a lot of classes and asked a lot of questions,” he says. The work paid off when, in 2022, he passed the exam on his first try for Grade I Wastewater Operator certification.

The North Valley plant uses a sequence batch reactor (Xylem). “The thing is basically a giant computer,” Michalak says. “The Xylem board controls everything. We have the ability to pull everything up on our iPads, run the plant off that, make changes, fix things.”

The three-year-old SBR replaced a 20-year-old activated sludge system that had maxed out on capacity as the population grew. The county chose the SBR for reasons including low cost, effluent quality and expandability.

## A SERIOUS HOBBY

Jeff Michalak admits he was clueless about the wastewater industry when he applied for work at the North Valley Wastewater Treatment Plant, but he had a mechanical background and that’s just what they needed.

He had always been interested in mechanics and had worked as an automotive mechanic before, during and after college. That remained his passion when he moved to Nevada and got a job with a casino.

“When I moved to Tahoe, I built a full commercial shop in my backyard just to work on all my stuff,” he says. “I ended up being a crew chief for a desert race team and working on race trucks in my spare time.

“Then I got big into four-wheeling and built a bunch of rock crawlers for all my friends because the Rubicon Trail is not too far from us. I built a 1964 FJ40 Land Cruiser from the frame up.”

He also built a giant camper out of a 26,000-pound, 28-foot Mack straight truck. “I took the box off and put a big bumper pull camper on the Mack bed. Then I went on tour riding dirt bikes and side-by-sides all over Arizona and Utah.”

“I think they spent about \$11 million on it,” Michalak says. “It was a hard deal because it came online during COVID so there was nobody around to tell us how it works. So, we had to learn the hard way.”

The plant has two basins that cycle opposite each other, one filling and aerating while the other settles and decants. It is designed to run 0.9 mgd but can handle up to 1 mgd. “When we started the process we were running about 350,000 gpd, but they’re building like crazy around here. Plus we’ve had a lot of rain and snow lately, so we’re now about 500,000 gpd.”

If ever needed, expansion would be easy. “We probably have 100 acres of land,” Michalak says. “And the way the thing is built, we could just add on two more SBRs.”

### PLANT OPERATIONS

Michalak runs the plant with Taflin and Auston Kinser, both Grade II Wastewater Operators. They also maintain 16 lift stations. “We do weekly PMs,” Michalak says. “We check everything, run all the numbers, make sure everything’s working right.” They fix the mechanical problems but call in an expert for SCADA issues.

The plant is manned eight hours a day, five days a week. Team members rotate on-call duty to respond to SCADA alarms, fix problems, and do two-and-a-half-hour rounds on Saturdays and Sundays.

“Every day you set out with a plan, and about 10 minutes into it your plan changes because something happened.”

JEFF MICHALAK

Flygt pumps (Xylem) send influent to the plant’s pump station, which sends it to an auger (Lakeside) to pull out rags, and then to a grit separator (Smith & Loveless).

“From there, there’s alternating cycles between mixing where there’s 24 minutes of no air then 24 minutes of air,” Michalak says. “It does that five times. Then it settles and decants the clear water off the top. We skim that off and send it through a chlorine contact basin. Our chlorine residual is usually less than 1 mg/L.”

From there the effluent goes to a 40-acre pond where 60% or more of it evaporates. The rest is sent to a nearby farm for irrigation. Waste activated



The Atlas Copco logo is positioned in the top right corner of the advertisement. It consists of the company name "Atlas Copco" in a white, serif font, centered between two horizontal white bars. The background of the entire advertisement is a photograph of an industrial wastewater treatment plant. In the foreground, two large, dark grey industrial blower units are visible, each with a blue vertical stripe and a control panel. These units are enclosed within a large, semi-transparent dome made of a glowing green hexagonal mesh. A glowing blue padlock icon is superimposed on the mesh between the two units. In the background, there are various industrial structures, including a large circular tank, pipes, and a building. The sky is clear and blue.

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“If something’s not right, I’ll wrack my brain until I figure it out.”  
JEFF MICHALAK

sludge is sent to a digester that cycles between aerobic and anerobic every four hours. A KSB pump then delivers the digested solids to 70-by-30-foot Geotube bags (TenCate Geocube), where polymer is added to aid dewatering.

“Water runs out of the bag, and after six to eight months of the bag drying out, we scoop it out and haul it to a landfill,” Michalak says.

### PROBLEM SOLVING

The treatment plant handles wastewater from a variety of sources: residential, golf courses, an industrial park, an airport. Michalak observes, “The town and the different neighborhoods have their own wastewater treatment, but the county picks up all the big spaces where it needs to travel a long way. We take stuff from all over the valley that no one else takes.”

Every day is a learning experience: “It’s unbelievable how many things can happen on a daily basis. Every day you set out with a plan, and about 10 minutes into it your plan changes because something happened.”

“One day we had a bizarre deal where a float that’s not even touching the water kicked a little bit and put the plant into high-flow mode, which shortens the length of a cycle. It shut the mixer and the air off to that basin because it doesn’t want to decant when there’s air or mixing going on. But we figured it out.”

In the winter of 2022-23 the area had an unusual amount of rain and snow, which caused flooding. About 100 manholes were underwater, leading to significant infiltration. On several days the plant saw flows over 1 mgd and a peak-day flow of 1.7 mgd.

One of the biggest challenges comes from a plant that makes juices for Starbucks. The plant’s wastewater containing fruit pulp is supposed to be sent to a storage tank pumped out by septic system contractors. But for various reasons some of that wastewater enters the sewer system.

“It’s super high BOD, and it’s a challenge to treat it,” Michalak says. “If anything suspicious like that happens, we go out and talk to them.”

Michalak enjoys solving problems: “If something’s not right, I’ll wrack my brain until I figure it out. And there’s tons of new stuff to learn all the time.”

### BRIGHT FUTURE

As in many states, older operators are retiring and not enough new people are coming into the field. Nevada Rural Water is actively recruiting



A map in the main office of the Minden treatment plant shows the locations of lift stations.



Michalak brought mechanical aptitude to his new career and worked diligently to learn the biology and chemistry of treatment processes. (AS950 All-Weather Refrigerated Sampler from Hach.)

young people. But Michalak is hooked on the industry and is studying for his Grade II Wastewater Operator certification. He enjoys the work, not to mention the retirement benefits.

“It was a little late for me to be starting a whole new career,” he says. “It’s a world I knew nothing about. But it’s awesome. I wish I had done this a long time ago.” tpo

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“I’ll try anything once.  
I may not do it twice,  
but I’ll try anything once.”

JERRY BAKER

Jerry Baker oversees maintenance on a system that includes two water-supply lagoons.

# A One-Man Department

IN A KANSAS COMMUNITY OF 300 PEOPLE, JERRY BAKER DOES IT ALL. THAT MEANS WATER, WASTEWATER, STREETS AND MORE, ALL WITH SMALL-TOWN PRIDE.

STORY: **Steve Lund** | PHOTOGRAPHY: **Denny Medley**





Jerry Baker,  
maintenance supervisor,  
Greenleaf Water System



## Jerry Baker, Greenleaf (Kansas) Water System

**POSITION:**  
Maintenance Supervisor

**EXPERIENCE:**  
20 years with the city

**EDUCATION:**  
Bachelor's degree, wildlife  
biology, Baker University,  
Baldwin City, Kansas

**CERTIFICATIONS:**  
Class I Water Operator,  
Class I Wastewater Operator

**AWARD:**  
2022 Municipal Water  
Operator of the Year, Kansas  
Rural Water Association

**GOAL:**  
Attain Wastewater Operator  
of the Year

Jerry Baker has a big job in a small town. As the only full-time city employee in Greenleaf, Kansas, Baker is responsible for water production, wastewater treatment, maintaining the water distribution and wastewater collection systems, mowing grass, repairing streets and much more. In summer he has a helper, but otherwise he's on his own.

Recently Baker saved the city substantial money by doing all the work to connect the Greenleaf Water system to the Washington County Rural Water District, so the water could be blended to comply with nitrate limits.

A few years earlier, he helped the city obtain a state grant to replace all the water distribution piping, which he installed with the help of numerous volunteers. Thanks to the grant and the volunteer labor, the city replaced its leaky water system without taking out a loan. Efforts like those led to Baker being named the 2022 Municipal Water Operator of the Year by the Kansas Rural Water Association.

### COMMUNITY MINDED

Greenleaf, about 175 miles northwest of Kansas City, has a population of about 350. Years ago the city was bigger, but a tornado in 1973 destroyed 42 homes and 26 businesses, and the population never fully recovered.

Greenleaf is big compared to the nearby town of Morrowville where Baker lives. He grew up there on a farm, and he still raises beef cattle with his father. As if farming and his city job didn't take enough time, Baker is the boys' track coach of the local junior high school. His wife, Misty, a grade school teacher, is the girls' track coach. Baker and his wife have four children.

While at Baker College in Baldwin City, Baker won NAIA All-America honors in track, reaching the national finals in the decathlon. When he graduated in 2004 with a degree in wildlife biology, the job market in his field was weak, and he took a job in Greenleaf.

The job has changed considerably, mainly because of the new water system. Previously, he spent a lot of time fixing leaks. "We went from 20% water loss to 5%," he says. "There was one time I fixed five leaks in one week."

Baker was involved in every aspect of the new water system project, from helping provide information for the grant proposal to



operating an excavator and connecting the pipes. The city replaced about 4.5 miles of steel waterlines with PVC pipe and installed new meters, fire hydrants and valves.

## TOWN SUPPORT

The project received a \$300,000 grant from the Kansas Small Towns Environment Program (KAN STEP), funded by the state Department of Commerce under the federal Community Development Block Grant program.

## WHATEVER NEEDS DOING

Jerry Baker was named Water Operator of the Year by the Kansas Rural Water Association, but a lot of his work isn't directly related to the water system.

For one thing, as maintenance supervisor for the city of Greenleaf, he is responsible for the sewer lines and the wastewater treatment system, which consists of three gravity-fed lagoons. He has Class I Water (entry level) Operator and Wastewater Operator certifications.

He's also in charge of mowing the city's grass, repairing streets and operating the city pool in the summer. That includes hiring lifeguards. On any given day, Baker might be cleaning out culverts blocked after a heavy rain, trimming trees, repairing playground equipment, putting new seats on park benches or patching potholes in the streets.

Ask what he'll be doing tomorrow, and he'll say, "Whatever needs to be done." Sometimes that means cleaning the homemade bar screen at the head of the wastewater lagoons that can get plugged by what Baker calls, "flushable wipes that ain't flushable." Sometimes leaks in the sewer system need fixing.

He has a trailer-mounted water jetter (Sewer Equipment) with 500 feet of hose for opening blocked sewer pipes. He also uses it for area hog farms that have blocked manure drains. Taking care of those jobs produces revenue for the city.

"We're the only ones who will go out and clean out a drain at a hog farm," Baker says. "We've got a corner on that market."

At the time, it was the largest water improvement grant KAN STEP had made. The grants pay for materials and technical services, but community recipients have to provide sweat equity, and in Greenleaf's case that meant volunteer labor. "That water system ended up costing the city about \$75,000," Baker says.

Greenleaf got another bargain when Baker and summer helper Drew Buhrman, along with Greg Metz from Kansas Rural Water, poured a concrete vault and did the plumbing for the connection to the Washington County Rural Water District. "We did it for \$40,000 less than the engineer put forward because we poured our own concrete vault and ran about half a mile of waterline," says Baker. "I hired out the electrical work because I'm not an electrician and I don't like working with electricity, but other than that, we did everything ourselves."

Dave Savage, mayor of Greenleaf, appreciates Baker's skills and his willingness to try new things: "He is very smart, and he can build or fix anything. And he's not afraid to do things." Baker believes that not having done something before isn't a reason to avoid a project. "I'll try anything once," he says. "I may not do it twice, but I'll try anything once."

## ONCE-A-GENERATION TASKS

That attitude serves him well, since he sometimes faces tasks that rarely need to be done. In early summer of 2023 he spent time with a backhoe and a dump truck, dredging one of the city's three wastewater treatment lagoons. Wastewater settles in the lagoons and flows from to another, and the water evaporates. Effluent seldom needs to be discharged, in part because the system was designed when Greenleaf's population was larger.

Baker believes the lagoon dredging project had never been done before. He isolated the lagoon and let it dry out, and was surprised that it dried out

enough so that he could go in with the backhoe and scoop the biosolids off the bottom.

"It's got a clay base in it," he says, "So you go out there and you scoop and you watch. I mean you just scoop the black off the top. When you see a color change, you quit." He piled the biosolids nearby and planned to spread them on a farm field next to the lagoons. You've got to sample it before you do anything," Baker says, "As long as there's no heavy metals or anything in it that's going to be harmful, I will spread it on a field in fall. You soil sample the field before and after."

When the blending vault was constructed, Greenleaf upgraded some of the basic infrastructure, adding variable-frequency flow drives (Eaton) and radio controls (EnGenius) instead of phone controls. "That made it easier to blend because I could slow the wells down to get the blend rate that we needed," Baker says.

Kansas has famously harsh weather, and right after the vault was completed a brutal cold snap froze a 2-inch pipe inside the vault. That prevented blending temporarily, but

“He is very smart, and he can build or fix anything.”

MAYOR DAN SAVAGE



Jerry Baker has done extensive work on and maintains the Greenleaf Community Clubhouse.





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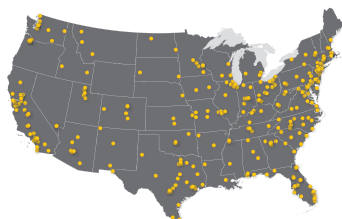
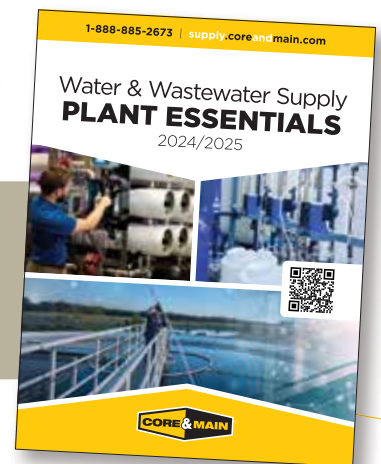


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the city's wells were still working, so no customers lost water pressure.

"I would imagine it froze because of fresh dirt around it, so the frost could go down quicker, because that vault is five feet in the ground," says Baker. "There's no way that thing

“Whatever I do,  
I want it to be  
the best.”

**JERRY BAKER**

ever should have frozen. The biggest issue was it fried the electrical outlet in there. I think it broke one fitting, but I had a spare fitting, so I got it fixed the next day and back going. Then I put a heater in there, so it won't happen again, I guarantee you that."

### LINING PIPES

One of the few tasks that Baker can't handle personally is relining sewer pipes. Every year, the city tries to line about 900 to 1,200 feet of sewer line. Greenleaf combines the work with that of other towns to make a project big enough to attract more contractors to bid.

"A bigger town like Marysville, just east of us, would put in for a bid and ask other towns if they want to piggyback to make the bid bigger and maybe a little more competitive," Baker says. "Then five or six other small towns will put in, and that's one bid. Otherwise, if I had them just come in here and do 1,000 feet, we couldn't afford it."

Baker makes a list of the areas with the most problems and adds them to the project with the other towns. Most of the sewer problems are root intrusions that cause backups. Contractors clean the pipes and repair them with cured-in-place lining. "We do whatever we can afford every year," says Baker. "We've been doing it for seven or eight years now. We started with the problem areas and have been working our way out from there."

Baker does a lot of the street work himself, including raising manholes up to grade and cold-patching streets, but if hot asphalt is necessary, the city hires contractors. "We buy 100 tons of cold-mix every year," says Baker. "We use that for patching, sealing. After we did the waterlines, I overlaid most of them myself. The really bad ones, we hired a contractor to overlay. Now I seal so many blocks every year, patch holes and seal."

The career isn't what Baker envisioned while studying wildlife biology, but he likes the job: "You know, people call me crazy, but I enjoy work. I like the variety. I do all kinds of stuff on the side, too. I farm, I cut trees for people. I pour concrete. I build things."

He's also proud of Greenleaf and the work he does for the city: "I want Greenleaf to have the best streets, to be the cleanest town around. We have the new water system, and we're working on the sewer system. Whatever I do, I want it to be the best." **tpo**



Besides taking care of the water system, Baker does street work including raising manholes up to grade and cold-patching pavement.



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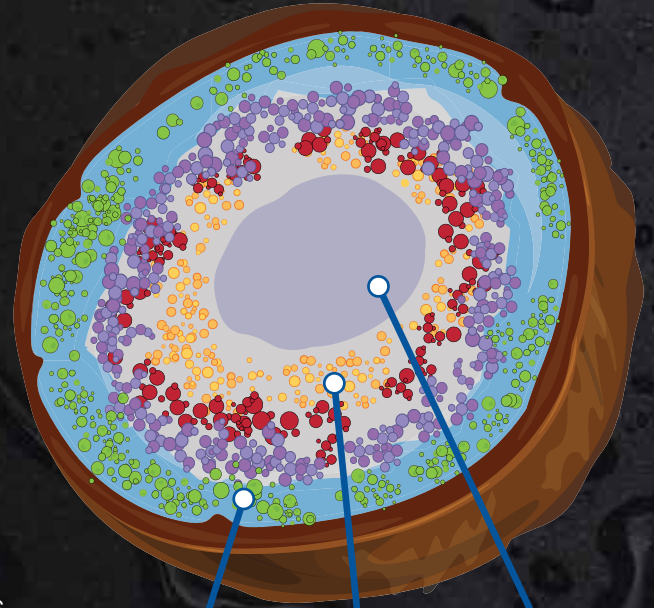




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# Creativity Unleashed

A NEW YORK WATER DISTRICT'S POSTER CONTEST ENGAGES CHILDREN IN GRADES 1-5 TO LEARN ABOUT AND PORTRAY WATER CONSERVATION

By Sandra Buettner

Hicksville Water District superintendent Paul Granger is no stranger to water poster contests. He has hosted them on and off for the past 25 years during his long career at various Long Island water districts.

"From early on, our public relations firm suggested that if we wanted to educate our residents on the importance of water conservation, we should start with the young children," Granger says. "That started our very first poster contest, and it has been gaining traction ever since."

The Hicksville district lies within the Town of Oyster Bay in Nassau County on Long Island. It supplies 2 billion gallons of water per year to nearly 48,000 residents.

The contest began in 2018. Entries have averaged 100 per year, but in 2023 there were 250.

"The contest has really caught on and it continues to grow every year as it gains popularity with the educators, school administration and, of course, the students," Granger says.

“It’s so nice to see families and the community coming together to celebrate the winners and their creativity and hard work.”

PAUL GRANGER, P.E.



Honoring the winners of the Hicksville Water District's 2023 Water Conservation Poster Contest were William Schuckmann, district chair (back, third from right), commissioners Nicholas Brigandi and Karl Schweitzer; Jennifer Sbrocco (back, far left); superintendent Paul Granger and treasurer Vincent Abbatiello.



These posters from recent contests demonstrate the creativity of the young artists and the variety of approaches to the topic of water conservation.

## READY, SET, DRAW!

Children in grades 1-5 are eligible. The water district works with the administration and teachers at the five public elementary schools in the Hicksville School District. There is one winner per class and a total of 25 to 30 winners each year.

The contest and its theme are announced during the first week of May to coincide with National Drinking Water Week. The schools provide the art supplies. The students have a few weeks to complete their drawings and turn them in to their teachers who forward them to the school district's director of fine arts.

The drawings are then sent to the water district for review and judging. First district staff members go through the submissions and make recommendations for the winning entries to the three members of the board of commissioners, who have the final say and pick one winner for each class.

As the children progress through the grades, some may win more than once. The contest was conducted virtually during the COVID pandemic. Participation is voluntary, but most teachers take part and promote the contest to their students.

The theme every year revolves around water conservation. "A lot of the posters contain pictures of water, washing hands, correlations to nature, wildlife and the planet," says Granger. "Some submissions are very creative and unique and show that the students really put a lot of thought into them."





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## CELEBRATING THE WINNERS

Once the winners are chosen, the schools and the students are notified. An awards ceremony is set after a venue is selected for 100 or more attendees. The awards ceremony is held in the early evening of a day in mid-June, just before the end of the school year. Winning posters are displayed around the venue on easels, bulletin boards and the walls.

The student winners bring their parents and often their siblings. Each winner receives a \$25 gift card, a personalized certificate of recognition, and district-themed reusable water bottles, Frisbee discs and tote bags.

A group photo is taken of the winners holding their certificates; each child receives a copy. Parents and family members also take pictures of the children with their posters and prizes. A reception follows.

“Hicksville is a very diverse community of residents coming from many cultural backgrounds,” Granger observes, “It’s so nice to see families and the community coming together to celebrate the winners and their creativity and hard work. It is refreshing to see all the energy in the room for the celebration.” **tpo**

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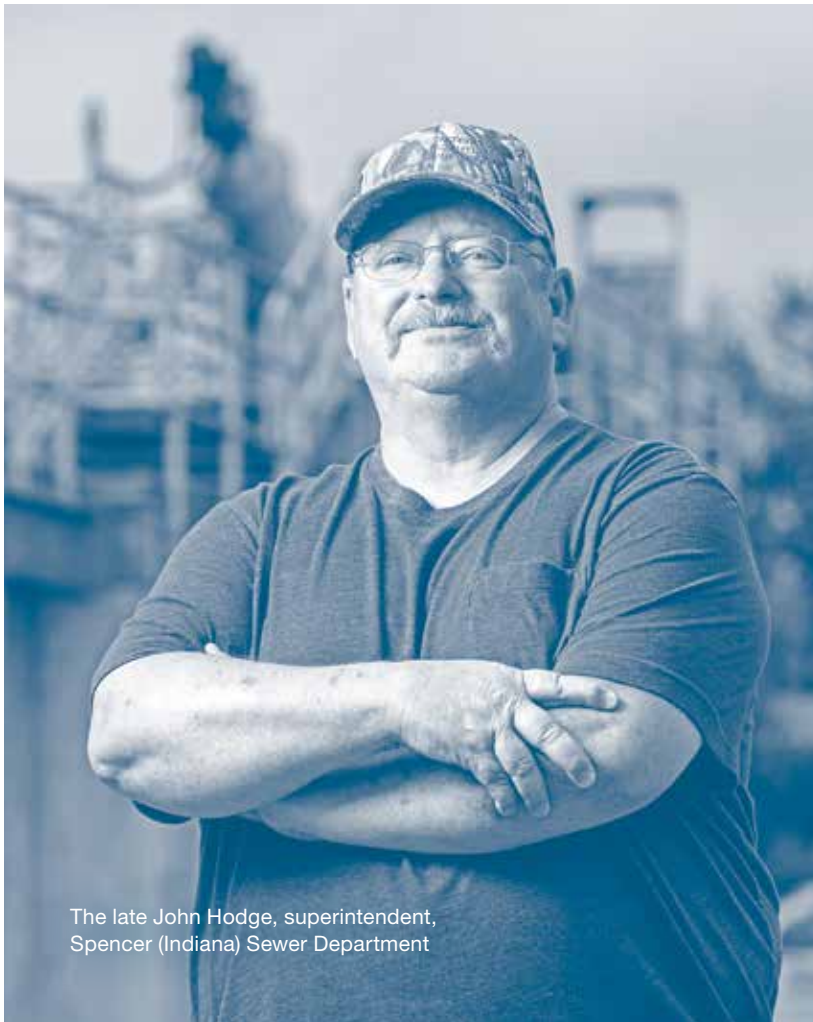
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# Builder of Community

AN ENTIRE INDIANA TOWN IS BETTER OFF FOR THE AWARD-WINNING EFFORTS OF JOHN HODGE AND HIS SEWER DEPARTMENT TEAM MEMBERS

STORY: **Jim Force** | PHOTOGRAPHY: **Marc Lebryk**



The late John Hodge, superintendent, Spencer (Indiana) Sewer Department

***Editor's Note:** John Luther Hodge, 61, died from a heart attack Aug. 23, 2023. Hodge was born on April 18, 1962 in Jenkins, Kentucky. He graduated Owen Valley High School in 1981 and served in the United States Navy. He was an active member of the Spencer (Indiana) American Legion and the Spencer VFW. Hodge is survived by his wife Rhonda, daughter Melissa (Adam) Dean, five siblings and numerous relatives. TPO is publishing this profile as a tribute to his career and his many years of service to the clean-water professions.*

He was quiet, humble and self-deprecating, yet he was a confidence builder for his community.

John Hodge, superintendent of the Spencer (Indiana) Sewer Department, rebuilt customer faith in the plant after effluent violations and reporting errors. He mentored young apprentices just coming into the profession, worked with a state park to accept its wastewater, and directed expansion plans at the community's 0.7 mgd wastewater treatment facility so that a local company could build housing for employees and remain in town.


"We could not have found a better person," says Jon Stantz, the town council member responsible for wastewater operations. The Alliance of Indiana Rural Water honored Hodge with its 2023 Operator of the Year award.

## WORKING TOGETHER

Hodge complimented his staff for willingness to pitch in wherever needed: "It's a heck of a lot easier when you have good people working for you and with you."

And he appreciated the town board. "They've been really good," he said. "They know that when I see something's broke, we're going to fix it. You can't just put something off." That was his approach when he came to Spencer 12 years ago.



A man wearing a blue t-shirt, khaki pants, and a camouflage baseball cap stands on a metal walkway at a wastewater treatment plant. He is leaning on a silver metal railing. The background shows industrial structures and green trees under a cloudy sky.

Hodge was instrumental in improving the town's sewer separation project, designed to reduce I&I and prevent sewer overflows.

“It’s a heck of a lot easier when you have good people working for you and with you.”

**JOHN HODGE**

The Spencer treatment plant serves a population of 2,300 using a trio of sequencing batch reactors (Aqua-Aerobic Systems) for biological treatment. A phosphorus removal requirement is met through alum addition. Effluent meets all parameters for quality, including a phosphorus limit of 1.0 mg/L.

In 2008, the plant added TeaCup grit removal (Hydro International) and a mechanical bar screen (Lakeside) in the headworks. Chlorine gas disinfects the effluent, which is then dechlorinated and discharged to the White River.



John Hodge (right) led a team that includes, from left, John Kelly, wastewater apprentice; Marsha Livingston, lab technician; and Ryan Klaassen, wastewater apprentice.

## John Hodge, Spencer (Indiana) Sewer Department

POSITION:  
**Superintendent**

EDUCATION:  
**Many CEU classes with the Alliance of Indiana Rural Water and others**

EXPERIENCE:  
**37 years in wastewater profession**

CERTIFICATION:  
**Class IV Wastewater Operator**

AWARDS:  
**2023 Wastewater Specialist of the Year, Alliance of Indiana Rural Water**

GOALS:  
**Accommodate community growth, leave facilities in shape for the next generation**



Biosolids are aerobically digested, stored in a pair of holding tanks, and thickened in dewatering bags before being trucked to a county landfill. Late last year the town added a solids handling building, rotary dewatering press (Fournier), and conveyor system to improve dewatering. Hodge says the dewatering bags were difficult to handle in winter weather.

The operations staff includes Ryan Klaassen and John Kelly, wastewater apprentices; Shelley Edwards, maintenance specialist, and Marsha Livingston,

lab technician. They monitor plant operations via PLCs. The plant is fully staffed from 8 a.m. to 5 p.m. on weekdays; operators rotate on-call duties on weekends. A 450 kW backup diesel generator (Cummins) is available to run the plant in an emergency.

### MEETING A BIG CHALLENGE

When Hodge came on board in Spencer, the treatment plant was violating *E. coli* limits and an employee had been accused of falsifying discharge records. One of his first challenges was to correct the situation and restore community confidence.

The key was giving the town a firsthand look at the changes and improvements he made. “We used plant tours to show people how clean the effluent was that we were discharging to the river,” he recalled.

Like many clean-water professionals, he understood that many people don’t comprehend what happens to wastewater once it’s flushed or drained away from their homes, “Until they get the bill, they don’t think about it.”

Stantz observes, “John was able to get the problems corrected and the plant operating the way it should be. He got us back on even keel.”

The operator award was the highlight of Hodge’s 37 years in the wastewater profession. “I was humbled by it,” he said. “I had no idea who nominated me.” He thought someone had a mistake when he heard his name called.

“We could not have found a better person.”

**JON STANTZ**

His career started when he left the Navy in 1986 and took a summer job at the Bloomington (Indiana) Wastewater Treatment Plant. After 26 years as an operator there, he took the position in Spencer as sewer department superintendent.

The apprentices joining the staff at Spencer surely benefit from their leader’s expertise and experience. “They come to us through the Alliance of Indiana Rural Water,” said Hodge. “It’s not like we go out and roll the dice. The alliance identifies young people who have an interest in the field and know what they’re getting into.”

It’s hard to find young people to join the utility, but the current two apprentices have worked out well. “They both have had some college, but that just wasn’t their thing,” he said. “It blows me away how much they’ve learned here.”

The plan is to have them train for two years and then take the required tests and get licensed. One young operator was ready for licensing in just one year. Hodge pointed out how important new blood is to the wastewater profession and his own team: “We’re getting older.”

### LENDING A HAND

While getting the treatment plant back on track and bringing the apprentices on board, Hodge was essential in improving the town’s sewer separation project, designed to reduce infiltration and inflow and prevent sewer overflows.

The town received a rural development grant of about \$700,000 to complete that project, and the town supplied another \$300,000. The project involved smoke testing, TV camera inspection, sewer lining, rehabilitating manholes and building new ones. “Some of our lines were dead-headed, with no access,” Hodge said.

He was also an essential adviser as the town prepared a 20-year plan to add collection and treatment capacity for residential and industrial growth.

*(continued)*



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“ He knew what needed to be done to stay in compliance.  
He had the town’s best interests in his heart.”

DREW FLANION

Among his accomplishments, Hodge helped an Indiana state park complete a \$4.7 million project to close its treatment facility, upgrade its sewer system and direct its wastewater to the Spencer facility.

The town plans to purchase five acres next to the treatment plant and add a fourth SBR and other equipment to handle increased flows. The plan will also evaluate green solutions, including solar panels and energy-efficient pumps. Solar could provide up to 30% of the energy required to operate the plant.

Hodge was a resource for others, as well. The McCormick’s Creek State Park, which offers year-round camping and recreation, completed a \$4.7 million project to close its treatment facility, upgrade its sewer system, and install lift stations to direct its wastewater to the Spencer facility, just a few miles away.

Hodge and Dwight Brooks, park director, worked together on the project, which is expected to save the park money in the long run. “John was very cooperative,” says Brooks. “He understood the benefit of the park decommissioning its



## BUILDING FOR BUSINESS

John Hodge and his Spencer Sewer Department helped a major manufacturer attract and retain workers. Cook Group, a global medical device manufacturer that employs 700, had difficulty finding employees because of a lack of local housing.

Cook team members often live a considerable distance from the company and must make long and expensive commutes. In a National Public Radio story, company officials said record high job openings and low unemployment were making the situation even worse.

The company has taken a novel approach by building homes and selling them at below-market prices to team members. As of last summer, the company had built 14 homes in a new subdivision called Pike Place. They average 1,300 to 1,500 square feet and sell for \$188,000 to \$212,000.

Contractors build at no risk since buyers are already identified. The town has responded by facilitating zoning requirements and providing needed infrastructure. Hodge’s team contributes to that and plans an expansion of the wastewater treatment facility from 0.7 mgd to 1.2 mgd.

Jimmy McElroy, construction manager with Cook Architecture and Engineering, says Hodge and the Town of Spencer have been great to work with: “They’ve put in all new gravity sewers and a lift station. “The project has gone well. They’re very receptive to what we want to do.”

wastewater treatment facilities. It was good to work with a local person who understood wastewater collection and treatment, as well as the value of the park.”

The transfer is serving as a prototype for other state parks around the state and is expected to save millions in new capital and operating costs.

## FAMILY TIME

In another cooperative venture, the Cook Group, a major manufacturer of medical equipment and the town’s largest employer, is building new housing to give team members places to live closer to the workplace. Hodge’s department is supporting that venture by adding sewer lines and lift stations for the development.

When not in the office, Hodge spent most of his time at home with his family, which includes a granddaughter who’s into sports. He made sure to attend all her games. As for his own games, he enjoyed playing Texas Hold ’em poker with friends.

Drew Flanion of Commonwealth Engineering, who serves as the town’s engineer, says the community had confidence in Hodge: “He knew what needed to be done to stay in compliance. He had the town’s best interests in his heart.” tpo

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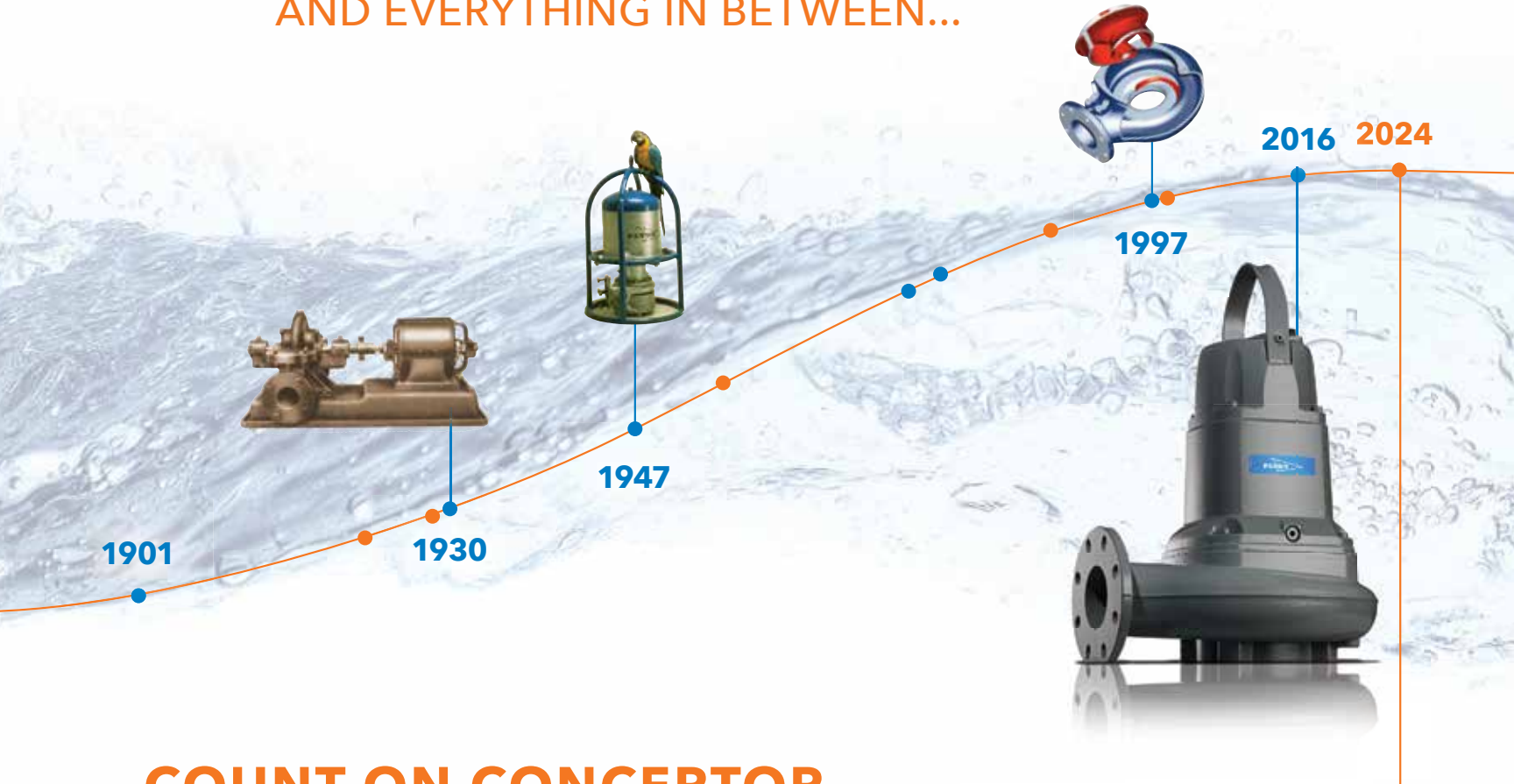
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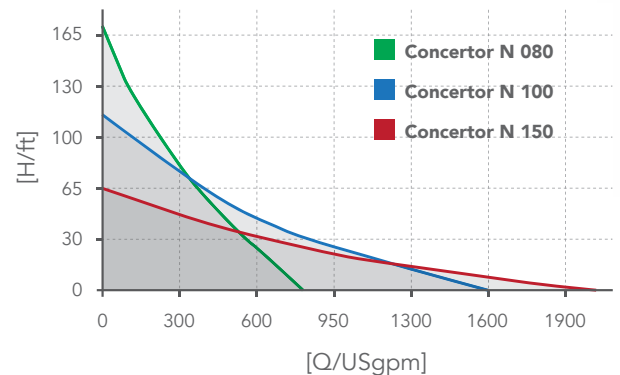
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The team at the Lake Stevens Sewer District includes, back row, from left, Duane McFall, lead maintenance; Travis Rosencrans, supervisor; Eric Echols, operator; and Ryan Bolden, laboratory analyst. Front row, Greg Bradley, operator; Chris Ayriss, senior operator; and Daniel Savoie, operator.



# Success in the Air

A WASHINGTON DISTRICT FACED A NEW EFFLUENT LIMIT ON TOTAL INORGANIC NITROGEN. OPTIMIZED AERATION HELPED ACHIEVE COMPLIANCE WITHOUT CAPITAL INVESTMENT.

By Ted J. Rulseh

Everything was running fine at the Lake Stevens Sewer District. Then the Washington Department of Ecology imposed a new permit limiting total inorganic nitrogen. The district had less than a year to comply.

A physical plant upgrade to meet the permit limit could have cost millions. Instead the clean-water plant team achieved compliance by optimizing the aeration process without any capital investment — and with significant energy cost savings in the bargain.

## IMMEDIATE CHALLENGE

The Lake Stevens district serves a scenic community of 40,000 about 30 miles northeast of Seattle. Its Sunnyside Wastewater Treatment Plant was commissioned in 2012, replacing a lagoon system that lay in the Snohomish River flood plain. “We needed to get out of the flood plain and take on additional flow for our growing community,” notes Mariah Low, district general manager.

The new plant uses an activated sludge process with a membrane bioreactor (MBR). It discharges to Puget Sound. Influent passes through a headworks with two 6 mm band screens and two rag washer/compactors (JWC Environmental).

After passing through the headworks, the flow proceeds to two primary clarifiers (only one in service at any given time). Supernatant flows to the primary building with 2 mm fine band screens (also JWC). Primary sludge

is sent from the clarifier to a WEMCO Hydrogritter (Trillium Flow Technologies) for grit removal. Flow then proceeds to a gravity thickener. From there, solids are sent to the anaerobic digesters and floatables return to the primary clarifiers.

Sludge wasted from the downstream end of the basins is sent to a thickening centrifuge (also Andritz D5LL). Thickened waste activated sludge goes to the digesters and supernatant to the return channel.

Screened wastewater goes through a flash mixer where it combines with return activated sludge and centrate, then to the three aeration basins (two online at any given time) and next to the MBR consisting of six trains, each with six membrane modules. The MBR effluent is UV disinfected (Ozonix) and discharged. Digested Class B biosolids are produced using Andritz D5LL decanter centrifuges and hauled out by a contractor for land application.

## PERMIT SURPRISE

The challenge came in January 2021 when the Department of Ecology issued a new general nutrient permit on top of the plant’s existing permit, limiting total inorganic nitrogen releases to 127,000 pounds per year and an annual average of 10 mg/L in effluent. “TIN was not something we previously had to worry about,” says Low, although the previous permit did include an effluent ammonia limit that remains in effect.

“Before we began working to optimize our system, Ecology looked at the previous five years of operation and estimated the amount of TIN we had been putting out,” Low says. “In three of those five years we had exceeded the amount they were imposing as our new regulatory limit.”

Before the optimization project, effluent TIN was averaging about 18 mg/L.

The new permit took effect on Jan. 1, 2022. In the preceding year, the Lake Stevens team worked with Grant Weaver of Grant Tech, who specializes in helping clean-water plants reduce nutrients affordably



The Lake Stevens team controls effluent nutrients by shutting down the blowers to a lone aeration basin for most of the day.



The pipe gallery at the Lake Stevens treatment facility.



and had assisted several plants nearby. His work was funded by the Snohomish County Public Utility District No. 1 as an energy-saving initiative.

### SEEKING SOLUTIONS

Working with Weaver and the utility district staff, the Lake Stevens team went through a cost-benefit analysis of several nutrient reduction strategies, focusing on those that could be deployed with little or no capital improvement.

The team settled on a strategy involving adjustments in aeration. Previously, each aeration basin functioned with two anoxic zones and three oxic zones, according to the original plant design.

Initially they shut off the air to the first oxic zone in the two operating basins on an alternating schedule, according to Travis Rosencrans, plant supervisor.

“We would turn one basin off for 45 minutes, while the other basin remained on,” says Rosencrans. “Then we would go switch it and turn the one that was off back on. We did that for quite a few months and noticed a difference in our TIN going down.

“But it got to the point where that manual process became a hassle. We almost had to make it somebody’s job to manage it throughout the day. If it didn’t get done, we noticed the difference in our TIN going up.”

### FINE-TUNING

As a different way to accomplish the same objective, the team changed to shutting off the air in the first zone of one basin 24 hours a day, except for a three- to four-minute “bump” of aeration at the start and at the end of the one daily eight-hour shift during which the plant is staffed.

With that approach, “We have been able to meet our yearly limit of TIN, and as of now we are a good bit under the limit every month,” says Low. Estimated baseline TIN discharges were 136,507 pounds in 2020 and 132,253 pounds in 2021.

“From January through September of 2023 we were at just 60% of our annual limit, or 76,465 pounds.”

MARIAH LOW

For all of 2022, under the new operating scheme, TIN discharges totaled 104,577 pounds. “From January through September of 2023, we were at just 60% of our annual limit, or 76,465 pounds,” Low says. Annual average effluent TIN has been 11 to 12 mg/L.

In the future, the team hopes to fine-tune the process further by automating the aeration sequence; that will require some capital cost still to be determined. “That is a project on our list to get done in the short term,” says Low.

Rosencrans notes that the plant team enjoyed working with Weaver: “He was extremely knowledgeable, very helpful and offered quite a bit of support.”

Lower energy consumption was a substantial added benefit of reducing aeration to one basin. The utility district estimates savings at 243,198 kWh per

year, translating to \$21,888 in avoided energy costs annually. The utility district also provided a \$55,610 Durable Operations and Maintenance Energy Savings incentive.

“The partnership with Grant Weaver and the Lake Stevens Sewer District was a win-win for everyone,” says Allison Grinczel, the utility district’s senior program manager. “It was very gratifying to work on a project that saved residents of Lake Stevens from having to pay for expensive infrastructure upgrades, while reducing the wastewater treatment plant’s impact on the grid and thus saving all our customers in the long run.” **tpo**

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# Heat Energy From Wastewater

AN INNOVATIVE SYSTEM IN DENVER DRAWS HEAT FROM MAJOR SEWER LINES TO HEAT AND COOL BUILDINGS IN A HISTORIC DISTRICT WHILE BENEFITING THE CLEAN-WATER UTILITY

By Steve Lund

A land-use issue at a historic site in Denver led to a huge thermal energy recovery project that benefits both that site and the wastewater utility. The National Western Center, which leases and operates the property that was once the Denver Stockyards, wanted to open its waterfront along the South Platte River. Its leaders approached Metro Water Recovery, operator of the nearby wastewater treatment plant, about burying the above-grade 72-inch sewer lines along the riverfront.

The initial response was cool — literally — because the lines were placed above ground to dissipate heat in the wastewater stream.

Brad Buchanan, CEO of the National Western Center, recounted how the dilemma was solved.

“A smart engineer and some folks from Colorado State University asked whether there was a way to capture the heat in the line and make use of it while solving both of our problems: creating green heating and cooling for the campus and helping to reduce the temperature of the wastewater.”

That sparked a long process leading to a system that provides 100% of the heat and cooling for some of the new buildings at National Western Center. It also fulfills a large share of the HVAC needs of another building; when expanded it will also help heat and cool other new buildings under construction or being planned.

The system was built by a consortium that includes CenTrio Energy, AECOM Technical Services and Denver-based Saunders Construction.

“The payback on these systems is becoming very competitive. It’s a viable and renewable energy source running right beneath our cities.”

TANJA RAUCH-WILLIAMS

## HEAT EXCHANGE

First the sewer pipes were buried, but part of the flow was diverted to a central utility plant built by the NWC. The diverted flow is connected to heat exchangers (Alfa Laval), in turn connected to a 30-inch HDPE pipe that is part of a closed loop through which water flows from the utility building to the NWC campus.

The water in the closed loop absorbs heat from the sewage. The buildings on the campus have heat pumps that extract the heat, amplify it and transfer it to a forced-air system. The wastewater pipe goes through a Shark macerating



The National Western Center built this central utility plant next to a buried sewer line. Heat exchangers inside transfer heat from wastewater to a closed loop that supplies heated water to several buildings.



Inside the central utility plant, a wastewater stream diverted from a 72-inch sewer pipe goes through macerator pumps to remove solids, then through heat exchangers (Alfa Laval).

pump (Zoeller Pump Company) to break down solids that might foul the heat exchangers. The solids and wastewater then flow back into the sewer system.

Both organizations benefit. NWC gets heat in winter and cooling in summer. Metro Water Recovery gains by reducing the temperature in the part of its raw wastewater flow that is routed through the heat exchangers by about 10 degrees F in winter. There are other economic benefits even though NWC does not pay the utility for the heat.

“Wastewater thermal energy use and district energy systems help us drive toward our vision of a sustainable future for our communities,” says Tanja Rauch-Williams, chief innovation officer for Metro Water Recovery.

“There is an indirect benefit to Metro and our customers since future regulations will require us to lower temperatures in the effluent during certain times of the year. Beneficial use of the thermal energy in wastewater will help minimize the capital investment required to meet those future regulations.”

## EXCEEDING EXPECTATIONS

The system has operated since April 2022. Heat transfer, ambient loop line efficiency, and thermal energy losses out of the ambient loop have all been better than expected, according to Buchanan. The only bad news is that more solids than anticipated need to be removed upstream from the heat exchangers. The main culprit is wipes.

NWC sized its central utility plant to accommodate more heat exchangers as new buildings go up on the campus. Although the heat exchangers are mechanical, the system requires power to run the macerators and to pump the water through the clean-water loop.





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The line runs about 3,500 feet from the central utility plant to the campus and back. The heat pumps at the buildings require power, and there are backup boilers and evaporative coolers. Nevertheless, the economic benefit of capturing heat from the wastewater is substantial.

“We did some extensive financial analysis, looking at the total cost of ownership,” Buchanan says. “You can’t just look at energy costs. You have to look at maintenance, labor, equipment replacement, everything fully loaded.

“Basically, it’s a 40-year payback. At 40 years, we will own the system free and clear. It becomes a much more attractive investment at that point. It’s probably better than that because energy prices have increased more than our model predicted.”

Flow and temperature data are collected in the central utility plant and along the ambient loop.

“The science behind this is pretty basic,” Buchanan says. “It’s similar to a geothermal system, but the operation is very sophisticated. The entire system is operated remotely from a center in Houston. There’s a very low labor requirement to operate the system.”

### VIALE ENERGY SOURCE

In winter, the heat exchangers take heat out of the wastewater stream, but in summer, when the ambient loop is used to cool the campus buildings, the heat exchangers can transfer heat into the wastewater stream. That is all right with Metro. “Metro’s discharge permit would require cooling the effluent only in winter, and the potential increase in wastewater temperature during summer is not a problem,” says Rauch-Williams.

In fact, Metro is seeking other organizations to develop similar systems to use the thermal energy from the wastewater stream.

“The payback on these systems is becoming very competitive over their lifetime at a larger commercial building scale, in district energy systems and in new construction or substantial building modifications,” says Rauch-Williams. “It’s a viable and renewable energy source running right beneath our cities.” **cpo**

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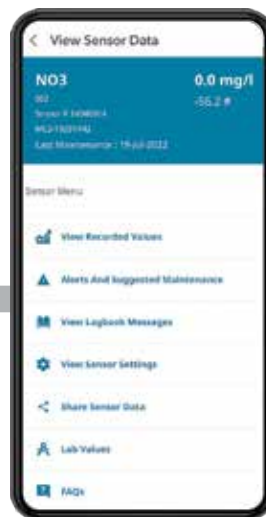




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1. Instruments in the IQ SensorNet allow users to monitor multiple parameters.
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3. Users can set maintenance reminders, and the app also tracks and logs activity.

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# Going Mobile

OPERATORS AND MAINTENANCE TECHNICIANS NOW CAN MONITOR TREATMENT PLANT PROCESS DATA FROM SENSOR NETWORKS WHILE IN THE FIELD ON HAND-HELD DEVICES

By Ted J. Rulseh

Effective data management is essential to process control in clean-water and drinking water plants.

Traditionally, plant personnel have accessed data from sensor networks from desktop computers or from SCADA systems in central control rooms. Today's mobile technologies make it possible for them to monitor that data while in the field on tablets or smartphones.

YSI, a Xylem brand, has captured that capability with its IQSN Mobile app, released in January. The app is an extension of the company's IQ SensorNet system, a network-based monitoring and control technology for small and large treatment plants.

Instruments in the IQ SensorNet enable users to monitor multiple parameters on a single network and thereby optimize processes, increase efficiency, reduce energy usage and simplify compliance reporting. The modular system of controllers and sensors that can be customized and expanded to meet facility needs.

IQSN Mobile extends that technology's utility and flexibility, giving operators information about sensor health, event notifications, maintenance reminders and more. Justin King, product manager for process with YSI, talked about the technology in an interview with *Treatment Plant Operator*.

**tpo:** What was the reason for creating this mobile application?

**King:** We wanted to enable plant personnel to see their data on demand, wherever they are, from throughout a whole municipal plant or across multiple plants all on one clean platform. Then we added features that include better data analysis and better management of the actual physical sensors.

**tpo:** How has sensor management been improved by this platform?

**King:** We added a diagnostic feature that reports the state of the sensors or the sensor network using a color-coded indication. It tells operators if the sensors are in the optimal state for measuring. It provides a reference other than a physical check to ensure that they are receiving accurate and reliable data.

**tpo:** What specific information is provided about the sensors' status?

**King:** It has a green check mark indicator that the sensor is operating properly. It tells you if a sensor is not measuring, or if it is operating in a pH or temperature outside the recommended range. In those events it also provides troubleshooting tips. It also tells you if a sensor has been put in a maintenance or calibration mode. As technology advances, we hope to advance the app to provide more specific information.

**tpo:** What would be an example of future capabilities that might be added?

**King:** We would like to add predictive diagnostic capability, incorporating algorithms and possibly artificial intelligence. So for example, suppose you have a pH sensor in the process and the app has noticed that over the last few days the pH is slowly drifting up. It then could look at the calibration data and determine that this sensor hasn't been calibrated in a month. It could then push out a message saying the measurement has been drifting and it might be time to calibrate the instrument.



**tpo:** Which team members in a plant would benefit by using the mobile app?

**King:** Everybody from the operations and maintenance staff on up to plant supervisors and managers can use it. And if they have a service contract, the service company's personnel can be given access so they know when to come out and service the sensors. Different accounts and permissions can be set up. For example, the chief operator could be set up as the administrator and could delegate and send notifications to plant operators or maintenance personnel.

**tpo:** How do the notifications work?

**King:** The system sends push notifications based on user input by text or email, or both. It's totally user-defined. Users can set maintenance reminders. For instance, the chief operator could set a monthly recurrence to calibrate a pH meter. Then a designated operator would get a message every month that it's time to calibrate that sensor. The app also tracks and logs activity. So after that pH sensor is calibrated, the chief operator can see that the work has been done, and the exact date and time when it happened. They can set up streamlined maintenance protocols for all the sensors in the system.

**tpo:** How easy is it for operators to read and understand the data display?

**King:** The user interface is the key to the app. When they log in, they see a drop-down menu that asks what facility they want to look at. They click on that to see all the readings in that plant. If they want to look into one particular sensor, they can click into that and view the data in a graphic format if they wish. They can also remotely export data for the sensor or the system. They select the data they want exported and the app will send it to the email account they have selected.

“Wherever the app is today, it's going to be better tomorrow, and the next day.”

JUSTIN KING

**tpo:** What is the benefit of being able to export data directly from the app?

**King:** Maybe they're not at the plant and they want to look at the data in a little more depth on the computer and run some analysis. Or maybe they need to do some troubleshooting issues. If there's an issue with a sensor or a network of sensors

and they can't figure it out, they can export the data to our technical support. Then we as the manufacturer can analyze that data a little more thoroughly. They can have the data sent from the app to their email account, and then forward that email to us.

**tpo:** Is there a sweet spot in terms of facility size or type where this technology is especially helpful?

**King:** The ideal users are on two ends of a spectrum. On one end, for big plants with 30, 40 or 50 sensors or multiple IQ SensorNet networks, there's a benefit to having every sensor and network under one application for viewing on a single screen. On the other end are smaller utilities that are decentralized, such as with multiple measuring points in a collection or distribution network.

**tpo:** Can IQSN Mobile operate with sensors from manufacturers other than YSI?

**King:** That is something we're working on. A big benefit of IQ SensorNet in general is that users can add third-party sensors. We want to enable those sensors to be visualized on the mobile app. In general, we will continue to make improvements to the mobile app, adding features and benefits as time goes on. Wherever the app is today, it's going to be better tomorrow and the next day. **tpo**

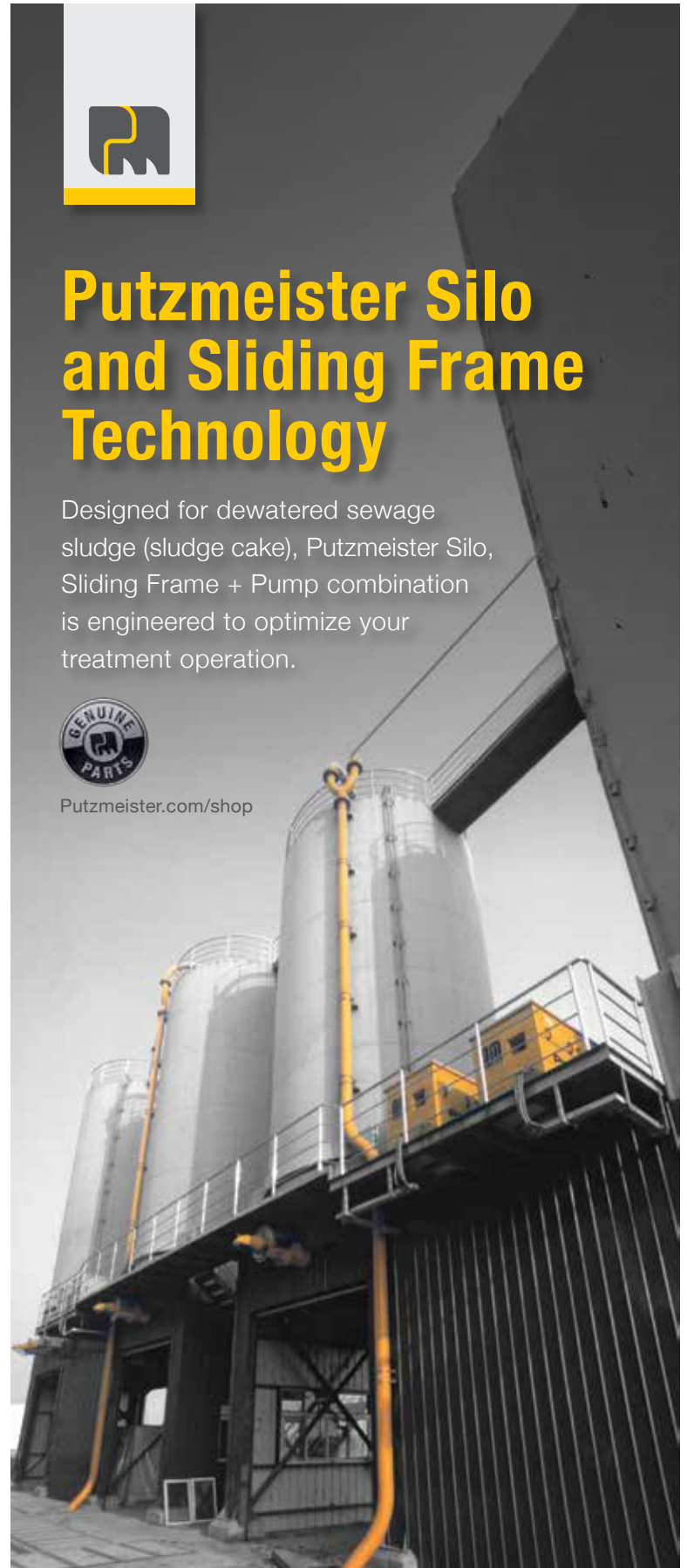


## Putzmeister Silo and Sliding Frame Technology

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# Pumps and Blowers, Drives and Valves

By Craig Mandli

## Centrifugal Pump

### VERTIFLO PUMP COMPANY SERIES 1600

Vertiflo Pump Company's Series 1600 horizontal close-coupled, vortex end-suction pumps have a wide range of applications including food processing solids, wastewater treatment, pollution control, slurries and solids. They have capacities to 1,600 gpm and heads to 170 feet TDH, and operate at temperatures up to 250 degrees F. These pumps are designed with a variety of constructions such as cast iron, 316 stainless steel fitted, all 316 stainless steel, alloy 20 or CD4MCu. They are designed with a convenient back pullout cost-saving feature to allow for easy inspection or maintenance without disturbing the piping to the pump. The impeller has a fully recessed design, which accommodates passage of solids. All impellers have wiping vanes, which reduce axial loading and prevent dirt from entering the sealing area. The impeller is keyed to the shaft and an impeller locking screw assures positive attachment. **513-530-0888; www.vertiflo.com**



Series 1600 pumps from Vertiflo Pump Company

## Chemical Feed Pump

### PULSAFEEDER PULSAPRO 7440



PulsaPro 7440 from Pulsafeeder

When chemical injection processes demand dependable and accurate delivery where space is limited and reliability and convenience are required, the Pulsapro 7440 from Pulsafeeder has the compact size and features to make operation and maintenance easier and faster. Its large, easy-to-view hydraulic diagnostic window provides observation of oil condition and proper pump operation, saving time troubleshooting. An externally adjustable bypass valve protects the pump from system over-pressurization and quickly adapt to changing process conditions. A push-to-purge button allows for on-demand removal of air from pump hydraulics to avoid wasting energy from inefficient pump operation. It provides dosing accuracy of +/- 0.5% across its operating range, whether the stroke length is set at full capacity or 10% of maximum. It is available with flows up to 1,098 gph and pressures up to 3,200 psig. **800-333-6677; www.pulsafeeder.com**

## Chopper Pumps

### NETZSCH PUMPS USA N.MAC CHANNEL TWIN SHAFT GRINDER

The N.Mac Channel Twin Shaft Grinder from NETZSCH Pumps USA crushes or fragments large and solid particles in liquid product



N.Mac Channel Twin Shaft Grinder from NETZSCH Pumps USA

and includes the Full Service-in-Place concept that allows users to carry out the complete maintenance and replacement of the cutting device without removing the entire grinder from the system. The housing design allows for quick and simple installation in sewers to crush impurities and offers numerous tooth combinations for the desired degree of crushing. The various geometries of the robust cutter cartridges enable smooth shredding of various solids. The mechanical seal cartridge design, a leak-free combination of mechanical seal and bearing cartridges, allows for quick and simple replacement and service. **610-363-8010; www.pumps-systems.netzsch.com**

### VAUGHAN CHOPPER PUMP

Self-priming Chopper Pumps from Vaughan are designed to be easily accessed outside of the wet well while pumping waste solids at heavy consistencies, without plugging or dewatering of the solids. They eliminate the loss in production and mess, along with making it easy to service the pump to get it back in operation. **888-249-2467; www.chopperpumps.com**



Chopper Pumps from Vaughan

### ZOELLER PUMP 72 HD SERIES



72 HD Series from Zoeller Pump

Zoeller Pump's 10 and 15 hp 72 HD Series is an expansion to its existing grinder product offering, now ranging from 1 to 15 hp. The units include a dual carbon ceramic shaft seal, moisture and thermal sensor, a buna-N gasket to protect the 3,450 rpm motor, and class F windings. Pumps are available in 208, 230, 460 or 575 volts using a three-phase connection. The 3- or 4-inch ANSI flanged horizontal discharge allows for easy adaption to a variety of grinder or solids-handling rail systems. Pumping performance ranges from 250 feet at shutoff and a maximum flow at 150 gpm at 50 feet TDH. Removable legs clear the bottom of the pump to allow debris to flow easier into the cutter assembly when used with a guide rail assembly. This assembly uses a 440 stainless steel with a Rockwell C hardness of 55-60 cutter and cutter plate in a scissor-like cutting motion that reduces solids down to 1/8 inch. **800-928-7867; www.zoellerengineered.com**

## Effluent Pumps

### ASHLAND PUMP EFFLUENT PUMPS

Heavy-duty effluent pumps from Ashland Pump are available in multiple horsepower sizes for various performance requirements, and feature efficient permanent split-capacitor motors. The oil-filled pumps have an upper and lower ball bearing design and handle solids up to 3/4 inch. They are heavy-duty cast iron, with cast iron impellers and equipped with a piggyback switch (20-foot standard cord) or in manual configurations. They are offered in 3/10, 4/10, 1/2, 3/4, 1 and 1 1/2 hp models. **855-281-6830; www.ashlandpump.com**



Heavy-duty effluent pumps from Ashland Pump





**BLUEline rotary lobe pumps from Boerger**

### BOERGER BLUELINE

Boerger BLUEline rotary lobe pumps are a self-priming, valveless, positive displacement pump used for conveying viscous and abrasive materials. They are resistant to wear and provide pulsation-free operation. Operation is fully reversible, with dry-run capability and flow rates up to 7,000 gpm. They are con-

structed with maintenance-in-place design, allowing for all wetted parts to be easily replaced through the front cover without removing pipe or drive systems. The pump conveys biosolids (primary, waste activated sludge, return activated sludge, digested, thickened, etc.), grease, sewage, scum, lime slurry, alum sludge, permeate and polymers. **612-435-7300; www.boerger.com**

## Metering Pump

### BLUE-WHITE FLEXFLO M3

FLEXFLO M3 chemical metering pumps from Blue-White dependably deliver smooth and accurate chemical dosing. It includes a bright, easy-to-access, and highly responsive 5-inch display screen, and the intuitive screen is as simple to operate as a cellphone. They have a



**FLEXFLO M3 chemical metering pumps from Blue-White**

broad 10,000-1 turndown ratio to meet a vast range of dosing requirements, and they're equipped with a brushless DC motor for trouble-free and energy-efficient service. Remote control signal options include Pulse, 4-20mA, Modbus TCP, EtherNet IP and PROFIBUS for enhanced supervision and automation for critical metering and transfer applications. **714-893-8529; www.blue-white.com**

## Slip Pump

### CAT PUMPS STAINLESS STEEL TRIPLEX PUMPS



**Stainless steel triplex pumps from Cat Pumps**

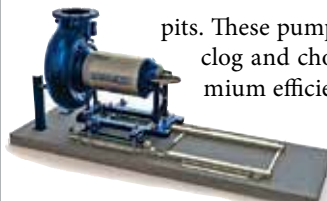
Cat Pumps stainless steel triplex pumps mounted to a gear motor can provide thousands of hours of maintenance-free slip pump service. Direct-coupling the pump to a gear motor offers many advantages, including a smaller footprint, reduced

noise and ease-of-service with no belts to maintain. A 316 stainless steel manifold, paired with elastomers like NBR, FPM, EPDM or PTFE, allows many chemical and fluid compatibility options. Performance specifications range from 0.1 to 100 gpm and 100 to 10,000 psi. Custom builds can include pump(s), motor(s), base, pressure control valves, pressure gauges and/or pulsation dampeners. Custom builds typically have a three to four-week lead time, with individual pumps and repair parts usually being in-stock items, with 95% of orders shipped within 24 hours of placement. **763-780-5440; www.catpumps.com**

## Submersible Pumps

### CRANE PUMPS & SYSTEMS ENVIE3

The envie3 air filled motor series dry pit submersible pump from Crane Pumps & Systems can run in wet applications and in dry



**envie3 submersible pump from Crane Pumps & Systems**

pits. These pumps took Barnes' and Deming's proven non-clog and chopper wet ends and outfitted it with a premium efficient IE3 motor that can run in both vertical and horizontal configurations. The closed-loop glycol cooling system allows for stress-free, easy maintenance and installation in demanding applications. The premium efficient IE3 motor delivers significant energy compared to an equivalent

oil-filled motor solution. For easy serviceability, the horizontal installation options include a cart system, which creates a back pullout option as well as a fixed bracket configuration. When installed horizontally, its footprint is 35% smaller than frame mounted end suction pumps. Vertical installation configurations include a metal and concrete stand that allow for 360-degree rotation, which makes adapting to existing piping convenient, including tangential discharge pumps. **937-214-9008; www.cranepumps.com**

### GORMAN-RUPP SFSC PUMP

The SFSC Pump from Gorman-Rupp is an SF Series product equipped with Eradicator Plus solids reduction technology. These are the most aggressive in the SF Series product lineup and are designed for applications where nonwoven flushable wipes, trash bags, hair, industrial byproducts and agricultural wastes are present. All pumps are equipped with a heavy-duty continuous vane impeller. The pumpout vanes incorporated into the thick back shroud are designed to help prevent buildup of debris behind the impeller. The wear plate utilizes notches and grooves with an oversized lacerating tooth designed to cut and shred organic solids before they enter the pump. Pumps are available in 3-, 4- and 6-inch discharge sizes. **419-755-1011; www.grpumps.com**



**SFSC Pump from Gorman-Rupp**

### INDUSTRIAL FLOW SOLUTIONS BJM PUMPS



**BJM Pumps submersible pump products from Industrial Flow Solutions**

BJM Pumps submersible pump products from Industrial Flow Solutions are designed for harsh environments to save money by minimizing downtime and increasing efficiency. This results in improved total cost of ownership over the service life of the pumps. They offer tailored solutions for

heavy solids-laden liquids, abrasive slurries, acidic or caustic fluids, and fluid temperatures up to 200 degrees F. Fahrenheit series high-temperature pumps are capable of continuously handling 200-degree solutions. **860-631-3618; www.flowsolutions.com**

## Vertical/Lift Station Pump

### SMITH & LOVELESS EVERLAST PUMP STATION

Smith & Loveless EVERLAST Pump Stations offer a high ease of operation and maintenance, high level of operator safety, long-lasting service life, pump technology that eliminates clogging from flushables and low life cycle costs. All pumping, mechanical and electrical components above the wet well with immediate access at ground level. This means that the STAR ONE Non-



**EVERLAST Pump Stations from Smith & Loveless**

Clog Pumps reside at ground level out of the sewage and always dry. Likewise, all the valves, piping and controls reside also above the wet well, meaning that inspection of the entire pump station can be accomplished in seconds by simply opening the hooded enclosure. **800-898-9122; www.smithandloveless.com**

## Blowers

### EURUS BLOWER ZZ SERIES

ZZ Series blowers from Eurus Blower are drop-in replacements for competitor blowers. They have heavy-duty cast housings, machined impellers, alloy steel shafts with oversized bearings, hardened/precision machined steel forged gears, oil-lubricated gear and/or grease- or oil-lubricated drive sides, plus keyless locking assemblies for easier timing gear maintenance. The blowers provide up to 15 psig pressure and 2,350 cfm flow. **918-361-0285; www.eurusblower.com**



ZZ Series blowers from Eurus Blower



Rotary screw blowers from KAESER

### KAESER ROTARY SCREW BLOWERS

Low-maintenance blower technology can help minimize power costs with load splitting, sequencing and superior multi-blower controls. KAESER rotary screw blowers are turnkey systems, available in sizes up to 335 hp and flows to 5,650 cfm, using up to 35% less energy than conventional rotary blowers, while energy savings of up to 15% can be achieved in comparison with turbo blowers. All blowers come complete with noise-insulated cabinets, inlet and outlet silencers, motors and drives. The intelligent Sigma Control 2 on each blower optimizes machine performance via various control modes and a full suite of sensors provides active condition monitoring to protect the machine. The combination of a blower air-end with high-efficiency SIGMA Profile rotors, flow-optimized components, efficient power transmission and drive components, ensures wire-to-air performance year after year. **866-516-6888; www.us.kaeser.com**

## Drives

### DSI DYNAMATIC SPM AND SPMV

SPM and SPMV variable speed pump drives from DSI Dynamatic are adjustable speed, air cooled salient pole, rotating field units suited for pump applications where the torque requirement increases with speed. These units may be horizontal foot-mounted or vertical flange mounted. They are available from 10 through 2,000 hp with closed-loop controllers. Full control of maximum pump load torque is accomplished with low excitation power. Continuous operation in ambient temperature to 104 degrees F is standard. Accurate speed regulation is maintained with a tachometer feedback system. OEM parts and factory service are available for all drives. **800-548-2169; www.dynamatic.com**



SPM and SPMV pump drives from DSI Dynamatic

### PIONEER PUMP ELECTRICPAK VFD

The ElectricPAK VFD from Pioneer Pump is a packaged variable-frequency drive solution available in 460 or 575VAC, 25 to 300 hp, and

designed to withstand the demands of mobile dewatering applications. It offers a touchscreen interface, known as SmartPrime, designed with a simple user interface similar to a mobile app. Users benefit from a fast startup and simple monitoring experience, rather than a complex keypad setup, advanced programming skills or specialized training required. Inside the unit, the VFD uses proven electronics to deliver dependable performance and optimized motor control. Choose a standalone option with a fully welded metal cage design keeping the VFD protected and secure during transport and setup while providing extra protection against job site hazards; or an integrated option with the quality and service of Franklin Electric. **503-266-4115; www.pioneerpump.com**



ElectricPAK VFD from Pioneer Pump

## Pump Controls

### APG NEUROS ADVANCED AERATION CONTROL SYSTEM

APG Neuros' Advanced Aeration Control System empowers water resource recovery facilities to take control of their biological secondary treatment processes. It uses self-learning algorithms referred to as Model Predictive Control to compute the oxygen demand to deliver



Advanced Aeration Control System from APG Neuros

performance from the entire aeration system. Including optional ammonia-based aeration control unlocks further savings potential by dynamically changing the dissolved oxygen setpoints based on the loading to deliver a reliable and stable ammonia treatment process at

the lowest oxygen level, reducing the oxygen requirements for treatment leads to significant reduction in power consumption and therefore reduces the operating costs by as much as 20%. Its Model Predictive Control analyzes historical operational data and raw trends that it uses to enable Advanced Aeration Control to compensate for the nonlinearities inherent to the secondary treatment process. The result is stable and accurate control over the full range of operating conditions without the need for manual re-tuning. **866-592-9482; www.apg-neuros.com**

### HALOGEN VALVE SYSTEMS TERMINATOR ACTUATOR

The Terminator Actuator from Halogen Valve Systems can be used on chlorine ton containers as well 150-pound cylinders to instantly stop the flow of chlorine in case of an emergency. The clamp mount version incorporates the same mounting clamp design as the Eclipse Actuator, allowing it to quickly and securely be installed on ton container valves without the use of any tools. It can be used on containers feeding through a pressure manifold or can be installed side by side with tank-mounted vacuum regulators. The Gemini controller provides DC power and control to one or two Terminators and can be combined for systems with larger quantities of containers. Emergency chlorine shutoff is initiated when the controller receives a close contact signal from a leak detector or included emergency shutoff switch and a relay output provides remote indication that an emergency close sequence has been performed. **949-261-5030; www.halogenvalve.com**



Terminator Actuator from Halogen Valve Systems



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[trilliumflow.com/waste-watertreatment](http://trilliumflow.com/waste-watertreatment)

## LUTZ-JESCO AMERICA TOPAX MC

The TOPAX MC multichannel controller from Lutz-JESCO America has a modular design that makes it an adaptable and effective solution for all measurement and control technology requirements. It offers automated efficiency — freedom from repetitive control tasks while providing accuracy and reliability. Users can actuate the dosing pumps using an optocoupler or relay and servomotors by using a relay or a 20mA output. The high-resolution, 5-inch color display offers a user-friendly operating interface with a simple touch-control and intuitive navigation menu that can be set to multiple languages. Use four analog outputs (0/4-20 mA) or the network capability to transfer measured values to a web browser or a telemaintenance point. A programmable interval timer can be used to set automatic alerts for wear-related sensor change. **800-554-2762; [www.lutzjescoamerica.com](http://www.lutzjescoamerica.com)**



TOPAX MC multichannel controller from Lutz-JESCO America

## Pump Parts/Supplies/Service

### A.Y. MCDONALD E-SERIES DURAMAC

The A.Y. McDonald E-Series DuraMAC water pressure booster system helps in obtaining proper water pressure. While ideal for residential applications, this pump comes complete with easy setup



E-Series DuraMAC water pressure booster system from A.Y. McDonald

instructions, all metal connections, a half-gallon pressure tank and check valve. In addition, experience a quiet operation due to the TEFC single-phase motor. Designed to shut off when no flow is detected, this solution gives an extra boost to water pressure. **800-292-2737; [www.aymdonald.com](http://www.aymdonald.com)**

## Valve

### ASAHI/AMERICA TYPE-21A SST

The Type-21a SST flow control true union ball valve from Asahi/America is available in 1/2- to 2-inch sizes, and features a precision-machined PVC ball with center provisions to support PTFE seats from zero to 100% flow capability. The valve produces equal percentage flow characteristics for fine throttling. It requires directional installation and comes equipped with a flow direction label. Manually operated SST ball valves include a zero-to-100-degree indicator plate and an indicator line on the handle, which doubles as a carrier adjustment tool. An ISO 5211 top flange bolt pattern and integrally molded base pad for panel mounting are standard, and the valve body is PVC with either EPDM or FKM O-rings. Socket, threaded and flanged end connections are all offered, and additional options and accessories are available upon request. **800-343-3618; [www.asahi-america.com](http://www.asahi-america.com) tpo**



Type-21a SST ball valve from Asahi/America



### OZ Lifting Products davit crane wheelbase

The new wheel base from OZ Lifting Products can be used with its full range of davit cranes up to 1,200-pound capacity. Made in the U.S., the wheelbase is adjustable and has four different length positions: 56.57 to 77.57 inches long, 32.44 inches wide and 36.87 inches high. It weighs 140 pounds when fully assembled (without a crane pedestal base), so the total weight will depend on the davit crane used. With durable steel construction and powder-coated finish, oversized casters make rolling the base and moving the crane easy. The floor anchoring system allows the davit to rotate 360 degrees, even when under load.

800-749-1064;

[www.ozliftingproducts.com](http://www.ozliftingproducts.com)



### Emerson ASCO Series 327C solenoid valve

Emerson's new ASCO Series 327C solenoid valve features a direct-acting, high-flow design that provides a superior flow-to-power ratio. The Series 327C design features a balanced poppet construction that permits high flows at minimum power levels, making it ideal for use in power plants, refineries and chemical processing facilities. The new valve features a unique, two-layer dynamic seal technology that provides low friction and excellent stiction resistance, helping ensure reliable valve operation in environments with temperatures ranging from minus 76 to 194 degrees F. In addition, the valve is Safety Integrity Level 3 capable, demonstrating

## product spotlight

### water

### Remote monitoring solution features low power consumption

By Craig Mandli

The traditional methods of water-quality monitoring are a thing of the past. No longer feasible are the slow, labor-intensive methods that require an operator to drive to sampling points, pull grab samples and test them in a lab. Smart technology can now monitor multiple parameters at once, allowing utilities to quickly detect and react to changes in the distribution system.

CAS DataLoggers is offering the **AERINOS ADS-300 wireless sensor end node from Infinite Informatics**. It is designed to transmit data via either NB-IoT/LTE-M cellular networks, targeting remote monitoring applications. NB-IoT is a wireless protocol designed for the Internet of Things that offers low-power operation using LTE cellular technology.

"The main thing that sets it apart is that it offers extremely low power consumption," says Terry Nagy, engineering manager with CAS DataLoggers. "It's a battery powered cellular device which can provide 3 to 5 years or more of maintenance-free operation."

The ADS-300 offers one analog input and one digital/counter input plus support for SDI-12 and RS485/Modbus serial communications. The analog input is designed for sensors with either a voltage or 4-20 mA current output. The digital input can be used as either on/off state input to record events such as a contact opening or closing or as digital counter input to capture pulses from a device like a flowmeter. The SDI-12 and RS485 interfaces can be used with smart sensors with serial data outputs.



Infinite Informatics AERINOS ADS-300 from CAS DataLoggers

It can be easily integrated with cloud platforms like Microsoft Azure IoT Hub, Amazon Web Services, Mosquitto MQTT brokers or dedicated IoT platforms like Losant. It is designed for applications that require remote, low power operation such as environmental and agricultural monitoring, level and flow measurements.

"The ability to push data to a variety of cloud services such as AWS and Azure has allowed the flexibility in how they gather and process the data," says Nagy. "For example, one customer is using it for level monitoring in a canal. They used to have to go out to the site periodically to download data from a stage discharge recorder. We were able to connect to this existing recorder via the SD-12 interface, and now they get data uploaded automatically every 15 minutes. Not only does it save them the time of going to the site to download stored data, they can have near real-time water level and discharge information." 800-956-4437; [www.dataloggerinc.com](http://www.dataloggerinc.com)

a high level of performance integrity and a very low risk of failure over the valve's projected life cycle.

800-972-2726; [www.emerson.com](http://www.emerson.com)



### Flowserve Limitorque QX Series B smart electric actuator

Flowserve Corp.'s Limitorque QX Series B quarter-turn smart electric actuator has a large, high-resolution liquid crystal display with adaptive brightness control that provides improved legibility as well as

real-time actuator status and valve position. Its IP68-rated double-sealed enclosure and non-intrusive control knobs eliminate the risk of water or dust ingress for improved reliability, and this design also removes the need for a heater. Increased precision is also achieved with 0.1% positioning accuracy.

972-443-6500; [www.flowserve.com](http://www.flowserve.com)



### SPIRAC SPIROGUARD CSO screen

Designed with advanced over-flow weir protection, SPIRAC's

SPIROGUARD CSO screen addresses the growing challenges of stormwater management by capturing unsightly pollution-causing solids. Low on maintenance, with standard, readily available parts, the conveyors for the SPIRAC CSO screens are shaftless, meaning less labor and less likelihood of blockages. With slower revolutions than shafted conveyors significantly reducing wear and tear, the design also allows increased volumes up to 600 gallons per second. In addition, there is a space-saving built-in grease-point extension, which removes the need for a platform. 770-632-9833; [www.spirac.com](http://www.spirac.com)

tpo



# Leading the way in wastewater aeration solutions



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## Revolving Around You™

## Cubus Turbo by Howden



## product spotlight wastewater

### Dosing pump solves ease of use, safety issues

By Craig Mandli

The metering pumps you use need to be accurate to ensure the safety of your community. The new **KB Series** from **Albin Pump, an Ingersoll Rand business**, is a robust and versatile peristaltic metering pump for high-precision dosing in water treatment or wastewater treatment applications. But not only do these pumps offer the accurate dosing characteristics needed in the industry, they ensure maximum safety and ease of use.

Pump models are offered with a maximum pressure level of 125 psi and flow rates up to 159 gph. They provide a suction lift of up to 30 feet and turndowns of 2,000-1. They feature self-priming capabilities, and are defined by their high-precision flow performance, with each rotation translating into exactly the same displacement and resulting in the delivery of a smooth and consistent chemical feed. Their offset rotor assembly releases tube compression during maintenance, which means that a tube change does not require the user to manipulate the tube while the rotor is turning or use a special tool to replace the tube. In addition, the tube can be drained and flushed prior to its removal.

“With the ability to self-prime and stay primed and its wide variety of chemically compatible hose materials, we have minimized operating costs and hassle when pumping disinfectant chemicals like sodium hypochlorite, peroxide and ferric chloride,” says Josh Donegia, global prod-

uct manager, low pressure pumps for Ingersoll Rand.

“Additionally it excels in the accurate metering of coagulants and flocculants as well as pH control chemicals, polyaluminum chloride, fluoride, and many other chemical metering applications.”

Albin Pump has put every effort into maximizing the safety and reliability of its newest peristaltic metering pumps, ensuring that they are easy to use and maintain. The pumps do not use any check valves or moving parts in the liquid path, with the tubing being the only wetted element and an integrated leak detection sensor in the pump housing. They are equipped with a color LCD display, and available with multi- analog and digital inputs and outputs for full control.

“Feedback on the first experiences with the new KB series of pumps has been overwhelmingly positive,” says Donegia. “Users have especially highlighted the simplicity in the user interface and ease of commissioning and doing regular maintenance on the pumps, which saves them time and solves numerous challenges they have experienced for years with other pump technologies.” [www.albinpump.com](http://www.albinpump.com)



# The Reuse Imperative

PETER ANNIN'S BOOK, *PURIFIED*, TAKES A CLOSE LOOK AT THE BENEFITS — AND NECESSITY — OF RECYCLING AS PART OF THE WATER-SUPPLY SOLUTION IN AN ERA OF CLIMATE CHANGE

By Ted J. Rulseh

The boom in wastewater recycling means big opportunities for water treatment professionals.

That's according to Peter Annin, author of the book, *Purified: How Recycled Sewage is Transforming Our Water*.

Annin spent five years learning about the stresses on water supplies, most acute in the dry climates of the West and Southwest, but also significant in some states with abundant rainfall — Florida and Georgia among them.

The book describes how communities increasingly look to direct and indirect potable reuse of wastewater as an essential part of the solution to constrained water supplies. The book describes the benefits and in fact the necessity of water recycling, along with the challenges of winning acceptance from the water-consuming public for reuse programs.

Annin isn't a newcomer to water topics. He's director of the Mary Griggs Burke Center for Freshwater Innovation at Northland College in Ashland, Wisconsin, and the author of *The Great Lakes Water Wars*, a book describing battles over the diversion of water to areas outside the lakes' watershed.

In *Purified*, he profiles communities' successes and failures in carrying out ambitious water recycling plans and demonstrates the folly of massive diversions as a solution to water-supply issues in arid and otherwise water-stressed regions. In an interview with *Treatment Plant Operator*, he also pointed out that growth in water recycling, and the advanced technologies involved, means an exciting future for the people who operate treatment facilities.

**tpo:** What inspired you to write this book?

**Annin:** I've been writing about water and climate for more than 20 years. It was clear when I started this project that there was going to be a water crisis in the Southwest, and I knew about water tension in other parts of the country. Not very many people are familiar with water recycling, so seeing a climate-driven water crisis coming, I decided to fill that knowledge gap. I set out to write a book that average citizens could quickly read to understand what potable water recycling is, why there is so much demand for it now, and why it's safe.

**tpo:** What has changed since *The Great Lakes Water Wars* was published five years ago?

**Annin:** The water crisis has gotten worse. The geography of water tension has spread in the U.S. and around the world. Some communities are running out of water and some actually have run out. People increasingly are living the water crisis. It is no longer a theoretical conversation. It's up to us who follow water issues to help the broader community understand how serious this is, and that we can't take water, including sewage, for granted anymore.

**tpo:** Why is long-distance diversion of water to dry areas no longer an option?

**Annin:** Long-range, large-scale water diversions are unsustainable. There has been talk about diverting water from the Mississippi River to Arizona. The carbon footprint of that is mind-boggling. So are all the other environmental implications, and the timing couldn't be worse, because the Mississippi is suffering historic lows right now, to the point that saltwater is reversing up the river from the Gulf of Mexico. The idea of robbing water from one climate-hammered watershed and sending it to another is ridiculous. That is the last century's way of doing things. This century's and the next century's way is potable water recycling. Desalination needs to be on the table for communities near the ocean, but water reuse is the lower-hanging fruit. The lowest-hanging fruit is conservation.

**tpo:** Why does this mean such a great opportunity for water treatment professionals?

**Annin:** It's amazing and exciting how much activity and investment there is in water recycling today. There is a concern in the industry that there may not be enough qualified operators to run the new high-tech treatment facilities. Demand for highly trained and experienced operators is only going to grow. Many of these operators will need both wastewater and drinking water certification.

**tpo:** How did you decide which potable reuse programs to explore in depth?

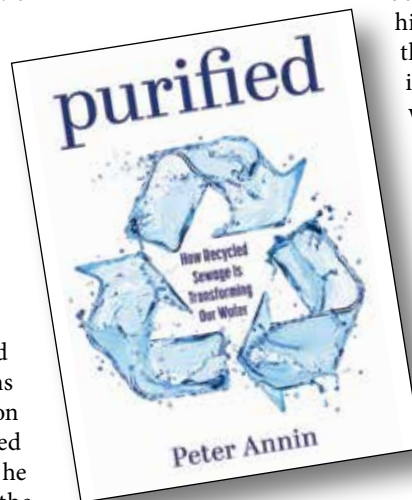
**Annin:** I traveled the Sunbelt to find the water recycling programs that were the most fascinating and had the most fascinating characters, but that also fit the broader narrative of the book, about where water recycling started, the highs and the lows. The story ends on a high note with all the investment that's happening today, and arguably the highest note is that former Los Angeles mayor Eric Garcetti in 2019 embarked on a plan to recycle 100% of that city's sewage by 2035. That is quite an endorsement of the technology.

**tpo:** What would you say is the most successful potable reuse program in the U.S.?

**Annin:** By far the most successful program in the U.S. and arguably the world is in Orange County, California. They're making indirect potable reuse part of the water supply for 2 million people. They were a trailblazer starting in the 1970s, sending that treated effluent through their potable water recycling system and then discharging it into the groundwater. They have served as a role model for emerging water recycling programs around the country, and they have been really gracious about sharing their knowledge and expertise with other utilities.



Peter Annin





**tpo:** To what extent are there technical or technological barriers to potable reuse?

**Annin:** We have the technology to turn sewage into drinking water. Above and beyond the technology to treat the water, we also need real-time monitoring of the water as it passes through the various stages of treatment. One emerging technical challenge is real-time monitoring in the sewer system, so that the utility can detect any illegal and potentially dangerous discharges long before they get to the wastewater treatment and potable water recycling plants. The sooner utilities know about these illegal dumpings, the better it is for the plant operators.

**tpo:** How heavily do factors like real-time monitoring and redundancy play into public acceptance of potable reuse?

**Annin:** Real-time monitoring is huge, and so is public understanding of the numerous layers of technology involved. El Paso, for example, is stacking reverse osmosis on top of UV, on top of granular activated carbon, an extraordinary series of layering. Some engineers may see that as overkill. It may be more expensive but it really helps with public perception and acceptance.

**tpo:** To what extent is the cost of potable reuse a potential barrier to its acceptance?

**Annin:** There is no doubt that water recycling is expensive. It's fascinating to look at how it compares to other options, because that depends on where you are and what your other options might be. In San Diego, for example, desalination is more expensive than water recycling. In El Paso, which is far from the ocean but sits atop brine-tainted aquifers, desalination of that groundwater is cheaper than wastewater recycling. The cost-benefit analysis depends on what options you have, the cost of those options and most of all the reliability of those options. In terms of reliability, sewage is always going to be there. The volume may decline with water conservation, but it's a supply that utilities can count on in perpetuity.

**tpo:** In your research, what did you learn about the importance of public outreach and communication?

**Annin:** It's really important for a utility's communication program to be as top-notch as the water treatment technology. When you're trying to convince average citizens that it's safe to turn sewage into drinking water, you have to be proactive, assertive and even aggressive in connecting with and being transparent with customers. It's a nonstop exercise. Orange County, even after doing it for decades, still has a robust outreach and communication effort.

“Water diversion is last century's way of doing things. This century's and the next century's way is potable water recycling.”

PETER ANNIN

And now we have Los Angeles, El Paso and others talking about direct potable reuse. So far it's OK; there is no real opposition at all. But we have seen through history that as projects get closer to coming online, especially when there hasn't been a robust communication outreach, that can change. Some sources I spoke to are worried about a backlash against direct potable reuse.

**tpo:** What would you say is the single most important characteristic of a successful public outreach program for potable reuse?

**Annin:** Everybody involved in the process on the wastewater and drinking water sides needs to go through extensive and repetitive communications training. In some cases communication is limited to higher levels and the people in the treatment plants aren't brought on board. When utilities

**tpo:** How much more difficult is public acceptance for direct versus indirect potable reuse?

**Annin:** We're just starting to find that out. We have Orange County, which is the most successful indirect potable reuse program.

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fail to help the entire team understand what the upper-level employees are trying to communicate to the general public, it just doesn't work. In some cases, utilities go through communication training once, and they think they're done. Unfortunately, the marketplace changes. Children grow up to be adults. New customers come in. Employees change. There must be an emphasis on how to communicate, and the whole team must be on board, especially those responsible for external communication.

**tpo:** Why in the book do you often use the term “purified sewage” for the end product, instead of more accepted industry terms like “recycled water” or “reclaimed wastewater”?

**Annin:** In the water recycling community there is a debate about how blunt or how euphemistic you should be. I road-tested these terms with a number of sources. Several said that “purified sewage” is what we're talking about: The starting product is sewage and the end product is purified water. As a journalist who's trying to help average citizens understand the process, I didn't want to be in a position where they would think I was being evasive, or I was spinning. If they got the sense that I was spinning it, the book would be less believable.

**tpo:** What do you see as the outlook for potable reuse and the role of operating professionals within it?

**Annin:** The water crisis is here. It's knocking on our door, and we need to act. It's exciting to see people taking another look at sewage and how every stage of the process can be made more sustainable and efficient. Wastewater and drinking water treatment plants can't be built in a couple of days. They are long-term capital investments. And then we need the right people to operate those facilities. It's a crucial role, and it's completely overlooked, misunderstood, and not appreciated by average citizens, and by policy makers in some cases. It's fascinating to think about where all this is going, It's an exciting time to be in the industry your readers are in. **tpo**

By Craig Mandli

## Liquid-only, low-horsepower pump systems replace grinders

### Problem

The Grizzly Ranch deluxe community in California's Sierra Nevada Mountains, faced problems with wastewater collection and treatment. On-lot grinder pumps at each household broke down every few years, costing about \$3,000 each to repair or replace. The sequencing batch reactor treatment system had never been turned on due to low flows; it required at least 10,000 gpd, and the community never reached that amount because of slow build-out and seasonal residents.

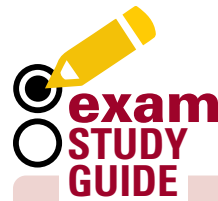
### Solution

District general manager Aaron Corr and retired Grizzly Ranch resident and community wastewater project manager Daniel Smith consulted with **Oreco Systems**, Pace Supply and Shaw Engineering. They replaced failed grinder pumps with liquid-only systems that include long-lasting, low-horsepower effluent pumps. Liquid from the septic tanks' clear zone is sent by 1/2 hp, 115-volt AC effluent pumps through small-diameter force mains to the treatment facility. An **AdvanTex AX-Max Wastewater Treatment System** replaced the SBR, providing year-round treatment of inconsistent flows. Units were installed in stages as the development grew. The system feeds high-quality effluent to the community's golf course irrigation pond.



### RESULT:

The AdvanTex system makes treated effluent available for irrigation, and so the facility was reclassified for wastewater reclamation. 800-348-9843; [www.oreco.com](http://www.oreco.com) tpo



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## WASTEWATER

By Rick Lallish

**During a visual inspection of the activated sludge aeration basin, you notice that a stiff white foam has formed on the surface. What is the most probable condition?**

- A. Young sludge or underloaded system
- B. Filamentous overloading
- C. Polymer overdosing
- D. Older sludge or overloaded system

**ANSWER:** A. The formation of stiff white foam on the aeration basin is typical of young sludge or an underloaded system. The food-to-microorganism ratio is most likely very high and the mean cell residence time is extremely low. Microscopic observation will show flagellates and amoeba as the highest populations, and the MLSS is very low. This is normal on plant startup, or after the bacterial population has been killed off due to shock loading or toxic conditions and is recovering. Measures to correct this condition are to reduce or stop any wasting, adjust the return activated sludge to build an acceptable blanket in the secondary clarifier, and move the sludge to the aeration basin. More information may be found in the OWP, CSU-Sacramento textbook: *Operation of Wastewater Treatment Plants* (Eighth Edition), Chapter 5.

## DRINKING WATER

By Drew Hoelscher

**PFAS chemicals found in some drinking water sources are what kind of compounds?**

- A. Synthetic organic compounds (SOCs)
- B. Volatile organic compounds (VOCs)
- C. Inorganic compounds (IOCs)
- D. Radionuclides

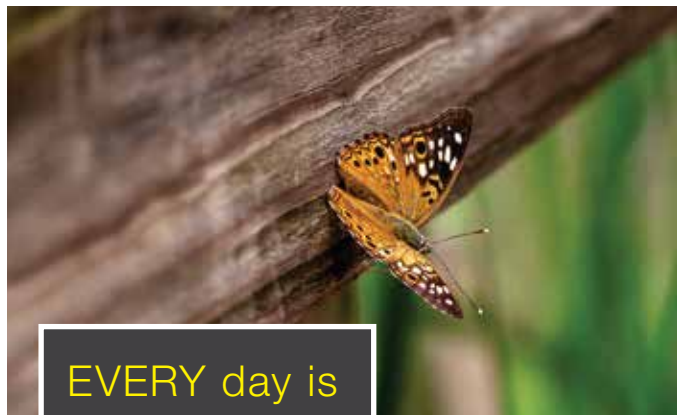
**ANSWER:** A. PFAS substances are SOC's used in many manufacturing practices. These substances are very stable and do not naturally degrade over time. PFAS are being monitored in drinking water supplies throughout the United States so that a better understanding can be developed.

### ABOUT THE AUTHORS

*Rick Lallish is water pollution control program director and Drew Hoelscher is program director of drinking water operations at the Environmental Resources Training Center of Southern Illinois University Edwardsville. tpo*

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### Mark Turpin returns to WWEMA Board of Directors

The Water and Wastewater Equipment Manufacturers Association has re-elected Mark Turpin, president of Duperon Corporation, for a third term on its board of directors. Turpin will join a prestigious group of industry leadership to help navigate an influx of issues impacting the sector, from regulatory issues like Build America and Buy America to broader topics like climate change and sustainability. Turpin previously served on the WWEMA board from 2012 to 2019, including a stint as chairman in 2017, chairperson-elect the prior year, and treasurer from 2014-2016.



Mark Turpin

### Centrisys/CNP to supply 12 decanter centrifuges for MSD project

Centrisys/CNP will replace existing units within the Metropolitan St. Louis Sewer District, at its Bissell Point and Lemay wastewater treatment facilities. The solids management upgrade design-build project, led by Kokosing/Plocher, will see the deployment of 12 Centrisys/CNP CS30-4DT 2-Phase decanter centrifuges, with six at Bissell Point and six at Lemay. MSDPC owns and operates seven wastewater treatment facilities treating an average flow of over 350 million gallons of wastewater per day. The Bissell Point and Lemay wastewater treatment facilities are the two largest plants, both serving the Mississippi River watershed.

### Grundfos extends its partnership with IWA for the Youth Action for SDG 6 Fellowship

In 2022, Grundfos, together with the International Water Association, initiated the Youth Action for SDG 6 Fellowship, giving 13 carefully selected Young Water Professionals a unique opportunity to make their voice heard on a global stage. Impressed with the work the YWPs have done over the year, Grundfos announced that it will continue to support the fellowship along with IWA by extending the collaboration and giving the YWPs the opportunity to work and strengthen their projects. The members who have passed the 35-year mark will support the fellowship in an advisory role, leaving 10 youth members on the journey to accelerate water action. Grundfos and IWA will continue conversations to reinforce the value of youth for the water sector at a global scale.

### Blacon Industries welcomes Stevens and Riché to team

Blacon Industries announced two new additions to its team, Jen Stevens as product marketing director and Chris Riché as engineering and product development director. Stevens has over 35 years' experience in engineering, applications, marketing and product management and previous organizations include Nidec, Ingersoll Rand, ITT Goulds and Tuthill. Riché has over 20 years' experience in pumping systems and equipment, and his recent experience includes product management in the world of IoT products and aftermarket parts.

### Stantec to design pump station for Northeast Ohio Regional Sewer District

Stantec has been chosen to lead design of the Southerly Tunnel Dewatering Pump Station for the Northeast Ohio Regional Sewer District. The pump station is the third and final large pump station for NEORS's combined sewer overflow program, which has been in progress for 13 years. The goal of the program is to reduce CSO to the environment over 25 years and capture 98% of CSO flow in a typical year, as required by the U.S. Environmental Protection Agency. When complete, Stantec will have led design for all three deep tunnel dewatering pump stations.

#### POSITIONS AVAILABLE

The City of Ormond Beach seeks a **Waste-water Treatment Plant Operator C, B, or A!** Please apply online at: [www.ormondbeach.org/jobs](http://www.ormondbeach.org/jobs) (T03)

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### SouthWest Water expands its headquarters in Sugar Land, Texas

Sugar Land Economic Development announced that SouthWest Water Co. has expanded its headquarters, relocating to a 41,114-square-foot facility at Sugar Land Town Square. The company signed a 15-year lease at 2150 Town Square Place, a newly renovated, mixed-use, Class A complex. The expansion will create 20 new jobs, adding to the company's workforce of more than 100 employees. SouthWest Water owns and operates regulated water and wastewater systems in seven states including Alabama, California, Florida, Louisiana, Oregon, South Carolina and Texas. **tpo**



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## people/awards

The **Region of Waterloo**, Ontario, received Gold Recognition from the Grand River Conservation Authority for outstanding performance of the Preston Wastewater Treatment Plant.

For the 10th consecutive year, **Sanitation District No. 1** in **northern Kentucky** received a certificate of achievement for Excellence in Financial Reporting from the Government Finance Officers Association of the United States and Canada.

**Derrick Mansell**, operations manager for the Orange County (California) Water District Groundwater Replenishment System, was named Outstanding Large Plant Operator of the Year by the Southwest Membrane Operator Association.

The **Hawaii Department of Transportation, Highways Maui District** received the 2023 MS4 Phase II Overall Award from the Water Environment Federation.

**Steve Schlichter**, superintendent of the Chatfield (Minnesota) Wastewater Treatment Facility received the 2023 Minnesota Wastewater Operators Association Southeast Class B Wastewater Operators Award.

**Larry N. Patterson**, executive director of Upper Trinity Regional Water was named Distinguished Graduate of the Zachry Department of Civil and Environmental Engineering at Texas A&M University.

The **Maggie Valley Sanitary District** was one of 15 utilities to receive Gold Star recognition for water quality from the North Carolina Department of Environmental Quality for outperforming drinking water standards for 10 or more consecutive years.

**Helix Water District** received a Golden Watchdog Award in Municipal and Educational Services from the San Diego County Taxpayers Association for its Tunnel Hill tanks project, which saved customers \$6.3 million.

The **Maine Water Company** received the 2023 Utility of the Year award from the New England Water Works Association.

**Torey Zuver**, superintendent at Chadron Utilities, received the 2023 Water Treatment Plant Operator Award from the AWWA Nebraska section.

**Sean Raynor**, wastewater treatment plant operator in Fredonia, New York retired after 28 years in the clean-water industry.

**Mark Tomko** was named general manager of the Vallejo (California) Flood and Wastewater District, succeeding **Melissa Morton**, who retired. Tomko was previously director of engineering.

**Jan Lee** was named assistant general manager of the Dublin San Ramon Services District, replacing **Dan McIntyre**, who retired.

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### We welcome letters to the editor.

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## events

### March 4-7

AWWA Membrane Technology Conference and Exposition, Palm Beach County Convention Center, West Palm Beach, Florida. Visit [www.awwa.org](http://www.awwa.org).

### March 10-13

South Carolina Environmental Conference, Sheraton Myrtle Beach Convention Center. Visit [www.scwaters.org](http://www.scwaters.org).

### March 11-14

WaterReuse 2024 Symposium, Hilton Denver City Center. Visit [www.watereuse.org](http://www.watereuse.org).

### March 12-14

Missouri Rural Water Association Annual Conference, St. Charles Convention Center. Visit [www.moruralwater.org](http://www.moruralwater.org).

### March 12-14

Nevada Water Environment Association Annual Conference, Palace Station, Las Vegas. Visit [www.nvwea.org](http://www.nvwea.org).

### March 20-22

Montana Rural Water Association Technical Conference and Exhibition, Heritage Inn, Great Falls. Visit [www.mrws.org](http://www.mrws.org).

### March 19-22

Michigan Rural Water Association Annual Conference, Soaring Eagle Resort, Mount Pleasant. Visit [www.mrwa.net](http://www.mrwa.net).

### March 24-27

Missouri Water Environment Association/MO-AWWA Joint Annual Meeting, Margaritaville Lake Resort Lake of the Ozarks, Osage Beach. Visit [www.mwea.org](http://www.mwea.org).

### March 26-28

Texas Rural Water Association RuralWaterCon2024, Henry B. Gonzalez Convention Center, San Antonio. Visit [www.trwa.org](http://www.trwa.org).

### March 26-29

Wisconsin Rural Water Association Annual Technical Conference, La Crosse Center. Visit [www.wrwa.org](http://www.wrwa.org).

### March 27-28

Nebraska Water Environment Association Great Plains Conference, Embassy Suites, La Vista. Visit [www.nebwea.org](http://www.nebwea.org).

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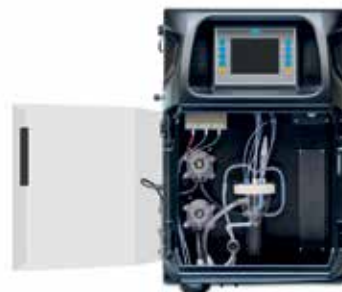
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