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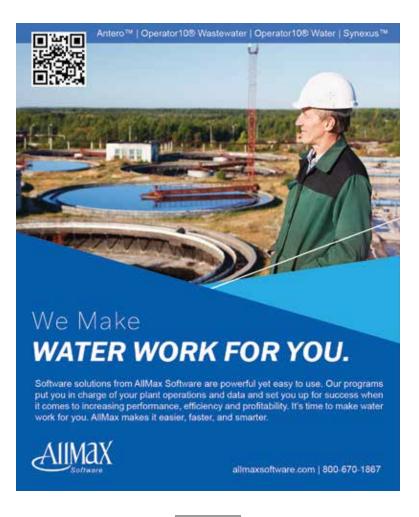
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By Sandra Buettner

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- Let's Be Clear: Water Environment Federation scholarships for operators
 TOP PERFORMERS: Wastewater Plant: Peirce Island WWTF, Portsmouth,
 New Hampshire
 Wastewater Plant: Hinckley (Illinois) Wastewater Treatment Plant
 Wastewater Operator: Wade Lagle, Urbana and Champaign (Illinois)
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When a Person Is a Pain

DEALING WITH DIFFICULT PEOPLE CAN BE, WELL, DIFFICULT. WE ALL FACE THEM AT WORK AND IN DAILY LIFE. HERE ARE SOME STRATEGIES FOR COPING WITH THEM.

By Ted J. Rulseh, Editor

e all have them in our lives: people who annoy us, antagonize us, push our buttons. In daily life we can often avoid them. When they are colleagues at work, we don't have that option. So, how can we learn to get along with or at least tolerate people who get under our skin?

The first step with someone who is difficult is to accept that we need to deal with them; wishing they would change their ways, leave us alone, quit or get fired won't solve anything. After that, there are various

strategies we can use. Here is some advice based on my research and some personal experiences.

Make allowances. Sometimes a person who is difficult is dealing with stresses outside work that you can't see — maybe a problem at home, worry about a medical condition, financial difficulty, a legal matter. Try not to be judgmental and write the person off as a jerk. Make an effort to look below the surface for what might be driving the objectionable behavior.

Take a look at yourself. Often, unpleasantness between two people works in both directions. Take a step back and consider whether something you're doing might be triggering the other person's behavior. Also consider whether you are being overly sensitive — reacting strongly to small annoyances that you would be better off ignoring.

Hold the anger. When a person does something to make us angry, the first instinct is to be angry right back. Once at a previous job, a colleague wrote a memo harshly criticizing me and shared it with our entire work team. I wrote a harsh memo in return and also copied the team. All that did was fracture the relationship and make me look petty. What I should have done was have a sit-down with the person behind a closed door and try to come to an understanding.

Make it personal. Instead of pushing the difficult person away, try opening up to them and see if they respond in kind. I once had a client no one on my team could stand. In dealings over the phone she was snobbish, overly critical, and incapable of making decisions. When asked to host her for a visit to our offices, I dreaded the day. But over lunch I shared information about myself and my family; soon she was talking about her outside-ofwork interests and her career as a college water polo player. She was much more pleasant to deal with after that.



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Focus on the issue, not the person. Once while I was working at an ad agency years ago, the creative director barged into my office and started berating me for delaying a project we'd been working on. I could have responded by pointing out that I had not delayed the project (and in fact I wasn't at fault). Instead I ignored the accusation, invited her to have a chair and said, "OK, what do you need from me?" Argument avoided. We worked it out and the job got done. She

probably still thought I caused the delay, but in the end, so what?

Put it on the table. Sometimes it's necessary to address the situation directly. When that time comes, do it tactfully. Don't hurl accusations. Instead, let the person know how their behavior affects you.

Instead of pushing the difficult person away, try opening up to them and see if they respond in kind.

Experts typically recommend using "I" language instead of "you" language. For example, instead of saying, "You are always criticizing me in front of other people," say, "I find it hurtful when you criticize me in front of other people.

Don't let them get you down. Never let a difficult person ruin your work life. Try to focus on the contributions they make to your workplace. Sometimes, despite their annoying habits, difficult people are excellent workers. Keep a positive and cheerful attitude. If you know the person is going to be around, learn to accept that. Think of it as a "gravity issue." Gravity is a relentless and restrictive force. It's always there. You just live with it. So it can be with that person who, every now and then, drives you half crazy. tpo



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LAGOON DRAINING

'Sea Dragon' Unearthed

The routine draining of a lagoon in Britain recently exposed the remains of a Jurassic reptilian sea-dweller called the ichthyosaur — colloquially known as the "sea dragon." The dinosaur fossil was discovered during preparation for re-landscaping and regrading islands in the United Kingdom's Rutland Water Nature Reserve.

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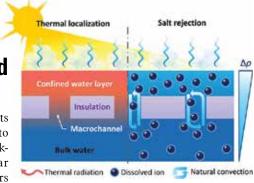
"Wastewater testing is an emerging strategy that can defeat limitations and stigma associated with individual drug testing, and it provides a more objective measure of drug use at neighborhood level."

Graphene Sensor Rapidly Detects Opioid Metabolites in Wastewater tpomag.com/featured

INEXPENSIVE DESALINATION

Solar-Powered System

Widespread research efforts have focused on ways to desalinate seawater or brackish water using just solar heat. A team of researchers



at MIT and in China has come up with a solution to the problem of salt accumulation, and in the process, developed a desalination system that is more efficient and less expensive than previous solar desalination methods.

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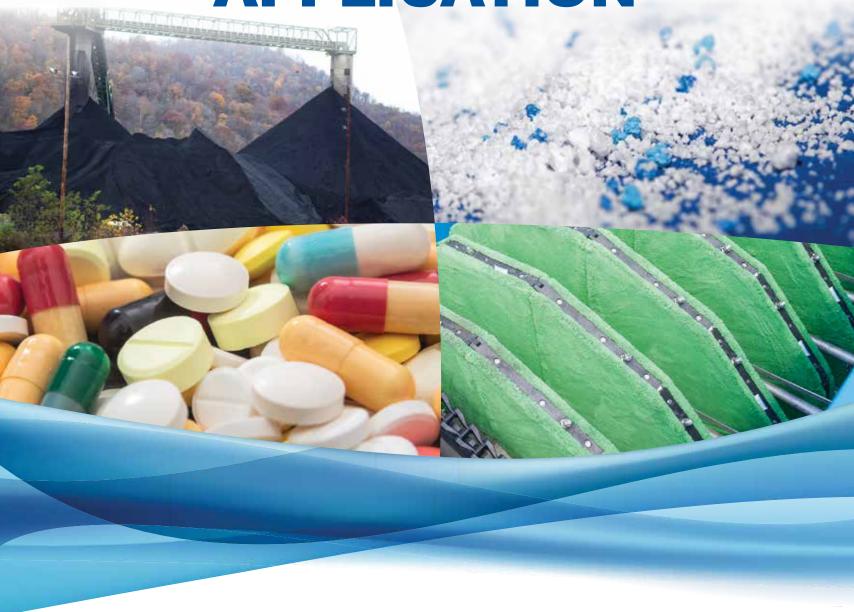


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Training for Excellence

AS EXECUTIVE DIRECTOR OF THE OPERATOR TRAINING COMMITTEE OF OHIO, CURTIS TRUSS JR. TAKES PRIDE IN FOSTERING WELL-ROUNDED WATER AND WASTEWATER PROFESSIONALS

STORY: Ted J. Rulseh | PHOTOGRAPHY: J.D. Pooley



We're not here to help you pass the exam. We're here to make you a better operator. I want you to understand the theory of operations."

urtis Truss believes that training has to do much more than teach aspiring operators how to pass certification exams.

His goal as executive director of the Operator Training Committee of Ohio is to give newly minted drinking water and wastewater professionals a thorough understanding of the facilities and processes they will encounter on the job.

"I tell them: We're not here to help you pass the exam. We're here to make you a better operator. I want you to understand the theory of operations. You may never see a flocculator, but we're going to find a layman's way for you to understand it.

"You need to be well rounded because you never know where the opening might be. Since there has been a downsizing of personnel in some of facilities, in a mediumsized city you could be working in water one day and wastewater the next."

EXPANSIVE PROGRAMS

OTCO's broad curriculum covers treatment plant operations, wastewater collections, drinking water distribution, backflow prevention, wastewater microbiology, chlorine training, well drilling and more. Training is offered through classroom programs, webinars, workshops, distance learning and correspondence courses.

"We're basically a vocational training school," Truss says. "We cover anything to do with water and wastewater, from basic to advanced. We do GIS and asset management. When the Lead and Copper Rule came along in the 1990s, we traveled around the state doing lead and copper training. We'll do almost anything the Ohio EPA or Ohio Department of Health asks us to do and that fits within our articles of incorporation."



The committee staff includes eight full-time people and about 20 adjunct instructors, most of whom work remotely.

OTCO operates as an independent nonprofit training organization, in conjunction with the AWWA Ohio Section, the Ohio Water Environment Association and the Ohio Rural Water Association. It is funded solely by revenue from course fees.

Curtis Truss Jr., Operator Training Committee of Ohio, Columbus

POSITION:

Executive Director

EXPERIENCE:

45 years in the industry as an operator and instructor

Engineering studies at The Ohio State University

EDUCATION:

Class III Wastewater Operator. **Class III Water Treatment** Operator

GOAL:

Continue delivering high-quality training to a new generation of professionals

for OTCO. In 1988 he was appointed as an Ohio Section AWWA Southwest District representative to the OTCO board of trustees. In the same year, he left Springfield to become a water resource engineer for water and wastewater systems at Central State University, one of the nation's oldest historically Black colleges, located in Wilberforce, Ohio.

There he also trained people from overseas, including from some African nations, in water and waste-

water. He left the university in 1990 to become OTCO's assistant director. By then, he was an Ohio EPA "double three," meaning he held Class III drinking water and wastewater operator certifications. He was promoted to OTCO executive director in 1998.

DEEP BACKGROUND

Truss has earned an AWWA George Warren Fuller Award, an Ohio Section AWWA Richard F. Melick Award for Education, and the WEF Five S Award for outstanding career achievement. He grew up in Springfield, Ohio; in the early 1970s he studied engineering at The Ohio State University and worked during summers at his hometown wastewater treatment plant. He decided to pursue a career in water and wastewater and in 1975 left college to work in the industry.

While working in Springfield he took a wide variety of training courses. In 1984 he began teaching advanced water treatment as an adjunct instructor

FILLING A NEED

OTCO plays a key role in filling the pipeline with new operators to replace those retiring. "We have a major shortage of people who want to be in this field," Truss says. There are few other sources of training in the state. Truss

A PROUD HISTORY

The roots of the Operator Training Committee of Ohio go back to August 1937, when the Ohio Public Health Council adopted mandatory certification regulations.

The rules required every water or wastewater treatment plant to operate under a person trained to perform the duties required and certified by the regulatory agency. At the time that was the Ohio Department of Health; it later became the Ohio Environmental Protection Agency.

After World War II, shortages of trained personnel developed, and certification examinations revealed the need for an effective education program. In 1947 a committee of representatives of AWWA Ohio Section, the Ohio Sewage and Industrial Waste Treatment Conference, the Ohio Department of Health, and The Ohio State University met to study the educational needs of water and wastewater plant operators and to establish a training school.

A school was started in 1948 under the direction of Professor W.D. Sheets of the Ohio State Water Resource Department. In 1964, the training activities became the nonprofit Operator Training Committee of Ohio. Sheets later became its first executive director.

In 1983, upon receiving a U.S. EPA wastewater training grant under Section 109(b) of the Clean Water Act. The committee became an EPA-recognized environmental training center for the state. The committee's philosophy has always been to make broad, comprehensive training available in order to produce well-informed, technically qualified water and wastewater personnel who are firmly grounded in the fundamentals.

one will get upset that we're taking somebody's job away. Generally, that's something like asset management, or GIS, or some other environmental project. We don't try to fill a union position with one of our interns."

People trained at OTCO often have a leg up when applying for positions because they have schooling backed by on-the-job experience, which students in college programs may not get, Truss observes. If two people with the same certification are competing for jobs, and one already has experience, "Who do you think is going to get hired first?"

NO SHORTCUTS

OTCO training courses typically last 14 weeks and aim to give students a sound foundation. Teaching to the exam is not even an option. "I can't see a state exam," says Truss. "By law I'm not allowed to once I've been certified. We're not even allowed to talk about what's on the exam. If we discuss the exam, take a picture of it, or reproduce it in any way, we can be prosecuted by the attorney general.

"Some students want the answers to the exam, and that's all. But they need to understand it and be able to apply it. It's not enough to know that the answer is total coliform. They need to understand what total coliform is and why it's an indicator organism."

A well-rounded education is essential in giving new operators flexibility. Truss notes that at facilities in major cities, like Cleveland, operators may have highly specific roles limited to a single process. But a smaller community may want someone able to move easily from one responsibility to another, including work on collection or distribution networks.

Ohio relies on licensing exams prepared by the Association of Boards of Certification, which are largely built around what operators need to know to

The next generation of operators are different from the group that is just leaving. So much more is expected of them in terms of knowledge level."

notes that some community colleges have tried offering two-year degrees; he considers that level of schooling unnecessary, although desirable.

"Go ahead and get a degree if you want to be a plant superintendent or service director," he says. "But to get to the top of the operations food chain, you don't need it. You need the experience and the education." OTCO, he says, has the advantage of providing courses taught by people with extensive hands-on experience in the industry.

About 80% of students at OTCO are already working in the field; they've been hired by a city or village and have two years to attain a Class I license. The remaining 20% are largely manufacturing workers changing careers after being laid off.

"They come to us through Job and Family Services, or some rehabilitative service," Truss says. "We get them a paid internship with a community wherever we can get them in. We put them in a place where no



perform on the job. Truss insists on going deeper. "ABC has done a really good job, but the next generation of operators are different from the group that is just leaving. So much more is expected of them in terms of knowledge level.

We're basically a vocational training school. We cover anything to do with water and wastewater, from basic to advanced."

CURTIS TRUSS

"Say it's one o'clock in the morning, you're running the wastewater treatment plant and something is going wrong. You shouldn't have to wait until the boss comes in the morning. You should be trained well enough to know what to do."

TRAINERS NEEDED

Just as operators face rising challenges, qualified trainers are increasingly hard to find, Truss observes. The pay for adjunct instructors often isn't enough to entice people with expertise and field experience; some employers are unwilling to give their team members time off to teach; some professionals are simply too busy with their lives.

"When I started teaching in 1984, it wasn't because I chose to," Truss recalls. "My boss came in and said, 'Hey, I heard you got your Class III. I need you to teach this class.' I was fortunate enough to have people encourage me to move with my passion and educate operators in the field on the fundamentals of water and wastewater.

"You want somebody who is not just knowledgeable in the field but who can sit down with that operator who works at a small aeration plant, or maybe a lagoon system. He needs to get a Class I, and you need to relate to him even though you work for one of the large facilities.

"You have all this expertise, and this guy does everything but put the Christmas lights out. He's got a lagoon system and now you're trying to explain the activated sludge process. That's the challenge, finding somebody who wants to take the extra time to do it right, not just for the money but because it's the right thing to do."

Nevertheless, Truss and the OTCO team are there, not just offering formal instruction but fulfilling the role played in most states by an operator association.

"The operators can call us literally any day of the week when they want some assistance. I say, 'OK, I'll send someone around. Or I'll say, 'I'm going to be in your area. Why don't I just come by and see what you've got?' We fill that void for many operators." tpo

A SOURCE OF INSPIRATION

Curtis Truss believes he got his work ethic from his father.

"My dad used to tell me, 'Find something that you love to do, and you'll never work a day in your life," he said. "He was a plumbing, heating and ventilation contractor, a jack of all trades. He just loved what he did. Eight weeks before he went to the hospital and passed away, he was still working as a master plumber.

"My 94-year-old mother tells me, 'You are just like your father.' I love what I do. I love to see people's faces light up when they've finally get it. When they come back and say, 'I got my Class III,' it is so cool!

"I'll probably be here until the board looks at me and tells me they're tired of me, or an operator looks at me and says, 'What's that old man doing here?' Eventually I'm going to fade into the woodwork. No one is indispensable. Somebody else will step up to the plate as time goes on. Until then, I'm still having fun."



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This view of Prineville from the rim rock above the city overlooks a golf course.

Building Sustainability — by **Not Building**

AN OREGON CITY EXPANDED ITS WATER SYSTEM WITHOUT ADDING CAPACITY TO TREATMENT PLANT. SOLUTIONS INCLUDE AN AQUIFER STORAGE AND RECOVERY SYSTEM AND WATER LOSS CONTROL

By Steve Lund

small city in the high desert of central Oregon takes advantage of an unusual geological feature to make its water supply more resilient.

Prineville, a city of 11,000 along the Crooked River, uses a confined aquifer deep underground that was an ancestral channel of the river. This channel was blocked by volcanic activity millions of years ago, but it still has characteristics of a riverbed, including rounded river rocks and gravel.

"It's like a huge bathtub," says Eric Klann, city engineer and public works director. "It's not like a big cavern; it has gravels, and gravels leave a lot of areas that you can saturate. We can inject a huge amount of water."

Prineville has drilled four wells into the confined aquifer; a camera sent down into the wells shows the interesting geological formation: "You are seeing lava, lava, lava and then all of a sudden you see these river rocks. You can actually see the water moving through those big river cobbles."

SUMMER SPIKES

During spring, fall and winter, demand for water is well below the capacity of Prineville's treatment plant. That means the city can treat more water than it needs and store the excess in the aquifer. In summer, when water demand is high, the stored water can be pumped out.

"The real beauty of aquifer storage and recovery is that the water treatment plant doesn't have to be sized to meet my maximum demand," Klann says. "We can run it a little bit harder than we need to in the winter and store a big amount of water, so that during the summer, when we need it, we can start pulling it out of the ground."

The water plant has a capacity of about 3 mgd, Average demand in winter is about 1 mgd, but in summer, when residents are irrigating lawns and two large data centers need water for cooling, demand is 4 to 5 mgd.

"If we didn't have the aquifer storage and recovery project, we would need a water treatment plant to meet the peak day demand," Klann says. The city stored about 100 million gallons in the aquifer in 2021, and Klann anticipates storing as much as 800 million gallons to meet future demands. (Annual demand is about 650 million gallons.)

SIMILAR PROJECTS

The aquifer storage and recovery project is not the first that Prineville has expanded its system without adding to its treatment facilities. In 2005,



Eric Klann, Prineville city engineer and public works director, inside the Prineville Water Treatment Plant, which has a capacity of 3 mgd. In summer this capacity is augmented by an aquifer storage and recovery system.

need a water treatment plant to meet the peak day demand."

ERIC KLANN

the city needed to expand its wastewater treatment capacity, and a consultant recommended building a \$62 million mechanical plant.

Instead, the city built a 120-acre wetland to provide additional treatment at a cost of \$7.7 million, part of it covered by grants. The wetland discharges to an aquifer that cools the water before it bubbles up into the Crooked River, benefitting the fish.

That project was one of five in the nation selected for a U.S. EPA Excep-

tional Project Pisces Award in 2018. It was also named Project of the Year in the 2018 Engineering Excellence Awards hosted by the American Council of Engineering Companies.

Prineville also boosted water system capacity without building with an aggressive leak detection and loss prevention program that started in 2007. It included replacing old wooden water mains, adding meters and meter-reading and billing software, and conducting regular audits. As a result, non-revenue water is down to about 2% from a high of 28%.

DATA CENTER SUPPORT

Prineville is home to two large data centers, one for Apple and one for Facebook. Although they are the largest water users in the system and are large consumers in summer, their water demand is not very high on an annual basis.

"They like Prineville's climate," Klann says. "For the majority of the year, they use the outdoor air to cool their system. They can operate very efficiently here. When it's really hot, they use a lot of water on a daily basis, but if you average it out, it's not that high."

The data center operators have supported Prineville's efforts to expand the water system in costeffective and environmentally sound ways. Apple provided the \$8.7 million required to develop the aguifer storage system.

"We strive try to find environmental projects to meet their needs," Klann says. "They really liked the wetland, and the aquifer project provides an environmentally sound source of water that is climate change resistant. That is a big deal."

HELP FOR THE FISH

The aquifer project has other environmental benefits. Prineville has several wells, some of them in shallow aquifers along the Crooked River. Those aguifers also support the flow of the river, home to steelhead, salmon and some endangered fish species.

When Prineville takes water from those shallow wells, it can mitigate any effects on the stream by releasing water from a reservoir about 20 miles upstream. The state Department of Fish and Wildlife determines when it is desirable to release the water

The storage project also reduces the need to take water from the shallow aquifers in summer when stream flows are low and the river gets warmer. The treated water from the shallow aquifers is potable

when it is stored in the deep aguifer, where it mixes with the water that is naturally there.

"The water in the aquifer does not have to be treated. It's a much deeper aguifer," Klann says. "With the shallow aguifer, we have issues with sulfur, manganese and iron. We're just treating it for taste and odor issues. Once we resolve those issues, it's similar to the water in that deeper confined aguifer. It happens to work out quite well." tpo



A Mentor to Many

MICHAEL SEDON EXCELS IN PLANT OPERATIONS. HE TAKES PRIDE IN HELPING HIS COLLEAGUES AND OTHERS ACHIEVE THEIR OWN BRANDS OF EXCELLENCE.

STORY: Ted J. Rulseh | PHOTOGRAPHY: Kevin Blackburn

years with Cranberry Township in western Pennsylvania.
Perhaps most important of all, he has seen the value of fully trained, team-oriented staff members. In 20 years as manager of the township's Brush Creek Water Pollution Control Facility, he has helped many operators build productive careers, as a community college instructor, in volunteer work with state associations,

ichael Sedon has seen a great deal in 34

He has reaped many rewards, both intrinsic and practical: Good mentorship has helped foster staff longevity at the Brush Creek plant. "If people have a decent supervisor and like their work, they're going to stick around for a while," Sedon says. "We don't see a lot of people moving other than for age. In the past 20 years, we have hired maybe two people who have moved on, and one of those was because his wife took her dream job down south."

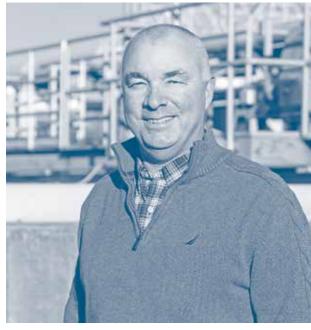
and through training programs at his own facility.

For his multiple efforts to help operators advance in certifications and professional success, Sedon received the 2021 Mentorship Award from the Water Environment Federation. "I think teaching, paying things forward, is pretty important," he says. "Someone nominated me for this mentorship award; they must think I'm doing something right."

HOMETOWN SUCCESS

Sedon grew up in Cranberry Township, about 20 minutes north of Pittsburgh. A rural community until the early 1980s, it has grown to a population of 40,000 because of easy access to the city by way of the Pennsylvania Turnpike and I-79.

Sedon was a Boy Scout, working his way up to the rank of Eagle Scout and for a couple of summers serving as a camp counselor. That brought out his passion for the outdoors and, quite possibly, his talent for leading and mentoring.



Michael Sedon, operations manager at the Brush Creek Water Pollution Control Facility, received the 2021 Mentorship Award from the Water Environment Federation.

After high school, Sedon attended Clarion University and earned a degree in biology, "a really good fit for a wastewater treatment plant," he observes. During college he worked summers at the Brush Creek plant. After college, in 1988, he took a job at the plant as lab supervisor; he later became assistant plant manager and, for the past 20 years, plant manager.

PLANT EVOLUTION

The Brush Creek facility was built in 1973 as a 0.5 mgd activated sludge plant. It was upgraded in 1979 to 3 mgd with rotating biological contactors; in 1999 it was converted back to activated sludge. The latest upgrade in 2020 involved a switched to membrane bioreactors.

Michael Sedon, Cranberry Township, Pennsylvania

POSITION: Operations Manager, Brush Creek Water Pollution Control Facility

CERTIFICATIONS:
Class A1 Wastewater Operator,
Class A1 Water Plant Operator

Pass knowledge and skills to the next generation of operators,





Sedon (right) and Mark Zaleski, lab technician, review recent lab tests. The plant team achieves consistently compliant effluent from a smoothrunning plant.



"We've seen a lot of technology changes over the years," Sedon says. "We're currently designed for 6 mgd; our average daily flow is about 3.4 mgd, and we have a peak wet-weather flow of 23 mgd. The attractiveness of the MBR process was being able to put the technology in a very small footprint, because we're landlocked where we are."

Wastewater enters a newly constructed influent pump station with a bar screen (Duperon) and Sulzer pumps. After three Jeta Grit chambers (Ovivo), the water flows to four primary clarifiers where ferric chloride is fed for phosphorus removal.

The flow then passes through two fine screens (Hydro-Dyne) and three aeration basins (the staff calls them bioreactors) configured for the Modified Ludzack-Ettinger process. "We remove nitrogen," Sedon says. "We don't have it in our permit yet, but we wanted be a little forward-thinking and add that on the front end of the construction."

From the bioreactors the water proceeds to six MBR trains (SUEZ) with 10 cassettes per train. After chlorine contact and a re-aeration/dechlorination tank, the effluent discharges to Brush Creek.

LEARNING TO GIVE BACK

The Brush Creek plant's 12-member team also handles operation and maintenance of three lift stations, three potable water storage tanks and a potable water booster station. Besides Sedon, the team includes Joe Corraini, crew leader; Larissa Hoover, lab supervisor; and operators Jim McConnell, Jack Lewis, Frank Houser, Brett Lester, Mike Ervin, Mark Zaleski, Pete Trkula, Clint Jenny, Brian Flanary and Joe Brown.

Sedon learned the importance of mentorship early in his tenure: "I was fortunate to work for this township and have a manager, Jerry Andree, who understood the value of volunteering with industry organizations. The Pennsylvania Water Environment Association has three sections, the Western, Central and Eastern Wastewater Operator Associations. Those sections roll up to the PWEA, which is a WEF Member Association."

Early on, Sedon attended association activities like plant tours and conferences. He took a seat on the board of the Western section and moved up through the chairs, ultimately becoming president. He then did the same within the PWEA, serving as president in 2015.

When Pennsylvania started its operator certification program, Sedon saw the value of teaching classes as a way to help operators earn their licenses and secure the continuing education hours — 30 every three years — needed to maintain them. He taught classes for the state Department of Environ-

mental Protection and later for a private training company, PH Environmental. He has also been an instructor at area community colleges.

"In 33 years I have some pretty good war stories and some practical advice to pass along to others," Sedon observes. "Local sections and the PWEA are always looking for instructors to put on courses at the conferences. Operators can come to a three-day conference and get up to 15 contact hours. If they do that every year and only have one license, they are well on their way or ahead of the game."

TAKING IT IN-HOUSE

Another logical step was to bring training into the plant and help the Cranberry Township team advance. The township career ladder includes six pay grades: Utility 1, 2, 3 and 4; Operator; and Advanced Operator. When operators earn a license, they receive a pay raise.

"The value to me as a manager is that if someone takes the exam and passes, I can assume they've done some homework and understand the techniques, means and methods that DEP wants in a reputable operator," Sedon says. "It's to my advantage to train my operators and get them certified.

"I had courses already prepared for others, so it wasn't too much of an effort. We try to get two or three people, sit them down and start them on the curriculum. We do one session on math, one on activated sludge, and so



The Brush Creek Water Pollution Control Facility has a design flow of 6 mgd and treats an average of 3.4 mgd. It uses a membrane bioreactor process.

(continued)

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on. Then we start with sample questions and practicing for the tests. It has worked out pretty well. Among the last eight or nine who have gone through my courses, all have passed their exams."

PRACTICAL BENEFITS

A well-trained team and a good training program were beneficial during the latest plant upgrade, which in addition to the MBRs included a pump station, new fine screens and rotary drum thickeners (Andritz).

"We were going to upgrade both the dry end and wet end, but to save money we decided to put the solids side on the back burner," says Sedon. "We're gearing up for a solids project in 2022-23." That will include two new centrifuges, two belt filter presses, and two anaerobic digesters to replace the existing auto-thermophilic aerobic digestion process.

"We had five staff members retire during construction of the upgrade. We had five new people come in when this place was like a moon surface. Everything was dug up. They didn't know what the plant looked like preconstruction, other than by looking at pictures.

"Then there was the technology aspect. We didn't know anything about MBRs. WEF has an operations manual on MBRs. We turned that into a

One of my favorite questions to ask in an interview is: Tell me a time when you had something go wrong, you had to fix it and you didn't know how to do it."

MICHAEL SEDON

course. We sat everybody down at lunch time for a couple of turns and gave them a 10,000-foot view of MBRs, so that when the startup team came from SUEZ, we would know the terminology.

"We don't know a thing about anaerobic digesters, so for the next upgrade the intent is to do the exact same thing. We'll do Digester 101 six months or so before startup, so everybody has a good idea what to expect when those digesters get installed. We've also started doing plant tours of digesters."

CAREFUL RECRUITING

When it comes to recruiting, Sedon looks for people who have mechanical skills, initiative and the ability to think on their own: "I want someone who will figure out why something broke and how to fix it, not just tell the next guy it's broken," says Sedon. "Maybe we don't know why the bar screen stopped turning. Is something jammed in the teeth? Did the motor kick out? Is it an electrical issue? It's the willingness to learn new things.

"People who played on sports teams in high school are good candidates because having a team environment is so important. People who have been on teams understand the roles and responsibilities of a teammate. That's a culture I try to put forward at our plant."

Experience in the industry is less important: "Only one of our last five hires had any water or wastewater experience. One of my favorite questions to ask in an interview is: Tell me a time when you had something go wrong, you had to fix it and you didn't know how to do it. The one who says, 'I had a 1995 Chevy Capris and I had to change the brakes; I went on YouTube and 10 minutes later I was back on the road' — that's what we're looking for."

DEBT OF GRATITUDE

While mentoring his team members and the operators in his various courses, Sedon is thankful for mentors he had along the way. They include Mike Henry, now retired from his last post at the Allegheny Valley wastewater treatment plant; and Michael Kyle, now at the Lancaster Area Sewer Authority.

"They are passionate about education and understanding the mission and vision of the organization," says Sedon. "I've seen them serve on state and local committees, and I saw how they operated their facilities and managed their teams. They were hard chargers. They really understood which end was up."

MAKING THE MOVIE

Michael Sedon likely never thought his clean-water career would involve a side trip into filmmaking.

In 2012, Sedon and his team created a video as an entry to the second annual See the BIG Picture contest, sponsored by Hach. As one of two grand prize winners, the Brush Creek Water Pollution Control Facility received \$50,000 in Hach instrumentation.

For the entries, Hach asked for before-and-after video submissions showing how the instruments would change operations at the facilities. In place of a straightforward presentation, Sedon and colleagues applied a healthy dose of creativity.

"I took the screenplay of *Back to the Future* and rewrote it as 'Hach to the Future,'" Sedon recalls. "Larissa Hoover, our lab supervisor, instead of being Marty McFly was Martina McFly. We had one of our operators be Doc. And we had a little time machine."

For their prizes, the team opted for ammonia probes for the plant's two bioreactors, along with Water Information Management Software (WIMS). "It has been a great tool for us because Larissa, where she worked before in a contract lab, had experience with laboratory information management systems," notes Sedon.

"We later acquired a sibling software package for WIMS called Claros Collect. Our operators used to do all kinds of paperwork daily. We got rid of all that and now we're on iPads doing that with Claros Collect. That has been good for us, looking at data in a better way."

Next up on the film making scene? Sedon would love to do a video called "Greaseballs," as a parody of *Spaceballs*. He declares, "Stay tuned!"

Closer to home, Sedon points to former township manager Jerry Andree and the public works directors who were his immediate supervisors. "They always allowed me to participate in water and wastewater activities," says Sedon.

"Jerry's vision was to make our township a leader, in traffic, in managing growth and more. He wanted Cranberry Township to be looked upon as a leader in water and wastewater. I try to tell my staff that our job is to be leaders and visionary people.

"Our lab supervisor, Larissa Hoover, developed a lab networking group; lab people from counties all around get together every quarter and talk about lab issues. She also developed wastewater courses for the lab."

As for his future, Sedon is contemplating one of his most important tasks: mentoring a new plant manager, likely someone already on his staff. "I feel the earliest I can retire is seven years," he says. "I've worked for a utility that has allowed me to grow professionally. I have a great team. Who knows when I'll hang up the skates? I plan to continue teaching and continue finding the best person to take over my spot." **tpo**

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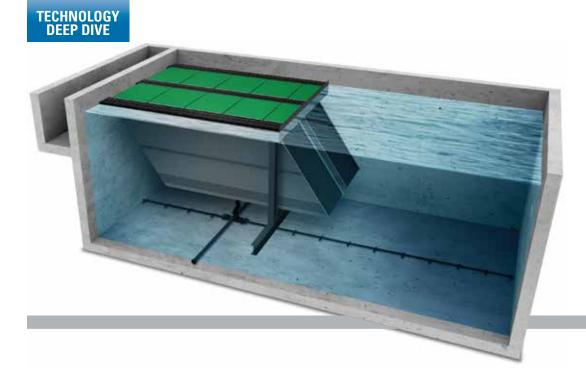


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Texler clarifiers use lighter, lower-cost materials, contributing to lower capital and installation costs.

The key advantage of the Texler system lies in the materials of construction."

MATT SCHOMAKER

Better Settling. Compact Space.

A LAMELLA CLARIFIER IS DESIGNED TO ENABLE EFFICIENT SEDIMENTATION AND LOW-TURBIDITY FINISHED WATER WITH INNOVATIVE MATERIALS OF CONSTRUCTION

By Ted J. Rulseh

fficient clarification is an essential component of drinking water treatment. Many water plants have existing rectangular sedimentation basins in need of refurbishing; some such facilities also need to expand, but are in sites where available land is limited.

Now Leopold, a Xylem brand, has introduced the Texler lamella clarifier, designed as a compact and efficient solution for sedimentation. It uses a series of inclined lamellae designed to fit in rectangular clarification basins, providing a large settling area within a small footprint.

With efficient solids removal, the process is built to achieve very low turbidity levels and to improve the filterability of the water. The lamella sheets are installed at a 55-degree angle; the company says the design can increase treatment capacity by up to 100% compared to conventional sedimentation.

While lamella clarifiers (also called plate settlers) have been around since the 1970s, the Texler uses different materials of construction, making it lighter and lower in capital and installation cost. The trough covers have an integrated V-notch weir design to provide even flow. Matt Schomaker, a treatment regional manager with Xylem, talked about the technology in an interview with *Treatment Plant Operator*.

tpo: What was the reason for bringing this product to market?

Schomaker: Over the last 10 years we have seen growing interest in lamella clarification systems. One of the main motivations is that plate settlers can take an existing sedimentation basin and essentially double its flow. The other major benefit is that when building a new treatment facility, the clarification footprint can be reduced as much as 80%.

LPO: What is the basic difference between lamella clarification and traditional methods?

Schomaker: Sedimentation systems have a flocculation process followed

by coagulation. The water then goes into a larger sedimentation tank where the particles settle out. Without a plate or tube settling system, it takes three to four hours of detention time for the solids to settle out. An inclined plate system can reduce that time to as low as 25 minutes in some applications. It's a very simple technology. There are no moving parts in the clarifier itself; the only moving parts are in the sludge collection mechanism beneath the plate settler.

LDO: How does the lamella settling process work?

Schomaker: It essentially adds surface area to the basin by providing the plate settlers inclined at a 55-degree angle. The coagulated water comes into the side of the system and travels up the plate and out through an effluent trough. The solids settle out upon contact with the plates and then settle down to the floor of the basin.

LDO: What makes the Texler lamella clarifier different?

Schomaker: The key advantage of the Texler system lies in the materials of construction. Traditional plate settler systems are made of all stainless steel components. The Texler uses HDPE for the side panels, and the plates are formed from an NSF-certified HDPE geotextile material. This geotextile is hydrophobic in nature, so it actually repels water. This helps to reduce material accumulation on the sheets, so that there is less need for cleaning. UV covers absorb 90% of the light and help minimize algae growth.

Upo: What other advantages do these construction materials provide?

Schomaker: A Texler system will be about one-third the overall weight of a stainless steel plate settler. That means much lighter support structure is required, and there is a cost benefit in the materials themselves. So a Texler system will have lower capital cost, and lower field installation cost due to the reduced support structure.

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LDO: What else is different about this technology?

Schomaker: It has a stainless steel effluent trough. That trough has cover with a V-notch weir to control the flow. The cover keeps wildlife from nesting in the troughs, and it also serves as an access point; operators can use it as a catwalk. It keeps them from coming in contact with the water surface if they need access to hose down the sheets or do any maintenance.

LDO: How easily can this technology be retrofitted to existing basins?

Schomaker: It is very conducive to retrofit in rectangular sedimentation basins. We can adapt the width of the lamella sheets to optimize the effectiveness of the existing basins. We can accommodate depths of 5, 8 or 10 feet. In any existing rectangular clarifier, a Texler system can be expected to increase efficiency and production.

tpo: Are there any sweet spots for this technology in terms of flow rate or source water characteristics?

Schomaker: Traditionally, we are looking at system flows larger than 1 mgd. It also applies to smaller steel tank systems. In terms of source water turbidity, we have done substantial testing in applications from 2 NTU, to 50-60 NTU, and with flashes up to 100 NTU. It can be used in reservoir systems and could also function effectively with river source waters.

LDO: What has been done to prove out this lamella clarifier?

Schomaker: We developed the concept about four years ago, and we have gone through a series of "toll gates" we use in developing any product to make sure the design is appropriate and the value is there to move forward. We have also done significant testing. That includes piloting at a site in western Pennsylvania for more than two years, on a fairly flashy river source water. With raw water turbidities from 2 NTU to 60 NTU, we've seen less than 1 NTU coming out. tpo



Smooth Scraping

A NORTH CAROLINA WASTEWATER TREATMENT PLANT RESOLVES A CLARIFIER ISSUE WITH A SELF-LUBRICATING BEARING THAT BOOSTS RELIABILITY AND CUTS MAINTENANCE COSTS

By Chris Speer

North Carolina clean-water plant was having difficulty with a rectangular primary clarifier.

The scraper flight boards and scum collector boards had gone out of sync causing the chain to jump the sprocket and fall off the guides.

An investigation found that the drive system needed a properly lubricated rolling element to minimize drag on the drive and chains so that they would not jump off the track or sprocket.

The plant in Durham, North Carolina (12 mgd average flow) found a solution in a graphite-metal alloy bearing for the fiberglass-reinforced plastic chain drive.

A TRUSTED SOURCE

In March 2020 Michael Richmond, reliability engineer with the Durham Department of Water Management, called a Graphalloy sales representative for help with the clarifier issue. Biomass from the clarifier is returned to the plant's biological nutrient removal process for further treatment.

"I had previous experience using Graphalloy bushings in a vertical turbine pump when I worked at a former employer in the oil and gas industry," Richmond recalls. "I was extremely happy with the results, so Graphalloy was the first idea that came to mind when we started experiencing drive bearing issues with the clarifier."

In chain-and-flight-type sludge and scum collectors, the FRP chain acts like a large rake that scrapes the sludge from the bottom of the clarifier. The flights move settled solids from the clarifier to a collection pit, while surface debris is pushed into a scum removal device.

When the chains jumped off the track, the clarifier became inefficient in removing the scum and primary solids. Richmond understood that downstream equipment could be negatively affected. "We wanted to avoid any process upset and unwanted downtime," Richmond says.

Two attributes made the Graphalloy bearings well suited for the Durham application.



A rake in the clarifier at the Durham treatment facility. The wastewater has been drained to enable maintenance.



The original Babbitt bearing in its housing. This was later replaced with a Graphalloy bearing.



A close-up view of the clarifier mechanism's fiberglass-reinforced plastic chain.



Graphalloy bearings in housings awaiting installation.

SELF-LUBRICATION

The Graphalloy bearings are made from a self-lubricating material that does not require grease or oil. "The original drive systems had Babbitt bearings that were submerged in the wastewater, and they would start to drag over time from lack of lubrication," says Richmond.

"Since proper lubrication is difficult to achieve in submerged applications, the self-lubricating properties of the Graphalloy sleeve bearings would allow for smooth operation of the drive shaft and sheaves for the scraper flight boards and scum collector boards."

LONG LIFE AND RELIABILITY

Chemically resistant and dimensionally stable, the alloy bearings are engineered to operate submerged and have been shown to operate reliably for



▲ For me, the self-lubricating properties of the Graphalloy make this product stand out." MICHAEL RICHMOND

years without maintenance. A Graphalloy representative noted that bearing failure can be costly. For example, a bearing failing in a 25-foot-deep clarifier can severely sap a maintenance team's time and budget.

The clarifier has to be drained and cleaned before the maintenance technicians can get in to replace the bearings and get the chain drive systems back into working condition. Bearing failures every

three months could cost hundreds of thousands of dollars. The new bearings would enable the maintenance and reliability teams to focus on other critical tasks and make their budget stretch farther.

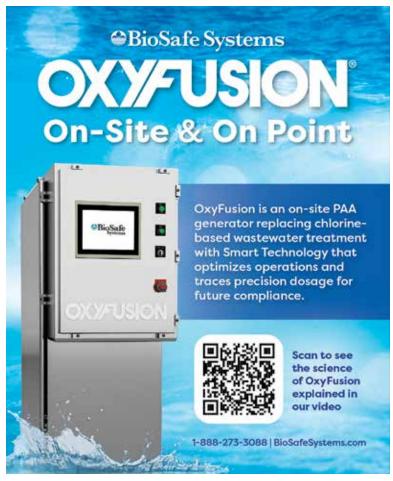
MAKING THE SWITCH

After a thorough engineering review, the Durham team decided to install the Graphalloy bearings into the FRP chain drive system. The problematic clarifier was drained and cleaned in a planned shutdown. "For me, the self-lubricating properties of the Graphalloy make this product stand out," says Richmond.

Installed in May 2021, the new bearings have work without any issues. This was not surprising in that the Graphalloy representative cited a wastewater treatment plant in the Northeast where a bushing from the company worked for more than 20 years. The company's bearings have been used successfully in several other wastewater treatment applications, including pumps, screens, mixers and aerators, and more.

ABOUT THE AUTHOR

Chris Speer (caspeer@graphalloy.com) is a territory sales manager with Graphite Metallizing Corp., a supplier of graphite/metal alloy bearings and bushings based in Yonkers, New York. tpo



Dealing With PFAS

AN EMERGING LARGE FAMILY OF "FOREVER CHEMICALS" WILL PRESENT GROWING TREATMENT AND COMMUNICATION CHALLENGES. HERE'S WHAT PLANT MANAGERS AND OPERATORS SHOULD KNOW.

By Ted J. Rulseh

he thousands of "forever chemicals" known collectively as PFAS are gaining attention as scientists study their prevalence in the environment and their potential effects on human health.

Much about PFAS remains unknown, but it's all but certain that more and tighter regulations are in the future. Late in 2021, the U.S. EPA issued a PFAS Strategic Roadmap (www.ewg.org/news-insights/news-release/2021/10/ pfas-roadmap-sets-new-direction-epa) that outlines plans to accelerate development of drinking water standards for the two most concerning PFAS, known as PFOA and PFOS.

In the meantime, the U.S. Congress passed the bipartisan Infrastructure Investment and Jobs Act, allocating billions of dollars for PFAS treatment and remediation, and for addressing the long-time problem of lead in drink-

The LaBella Associates engineering, consulting and construction company has developed expertise in helping municipalities deal with PFAS contamination. Company representatives Greg Senecal, environmental director; Dan Noll, senior environmental engineer; and Keith Garbrick, senior civil engineer, addressed a range of PFAS issues in an interview with Treatment Plant Operator.

LDO: How would you compare the health risks of PFAS against the risks of lead in drinking water systems?

Senecal: Lead is a single metallic compound that is well understood and well studied. The health effects of lead have been known for almost a century. PFAS is a group of 4,000 to 10,000 perfluoralkyl and polyfluoroalkyl compounds for which toxicological studies have been started only recently. As studies are unfolding across the globe, we see evidence that PFAS may correlate with health effects including lower birth weights and lowered immunological response in younger people.

Upo: What are the components of the EPA's PFAS Strategic Roadmap?

GREG SENECAL

Senecal: It is a four-year list of actions that follow three primary categories: research, restrict and remediate. The first of these focuses on EPA and other federal agency research, including classifica-

tion of the thousands of similar PFAS compounds and efforts to understand the human health and ecological effects of the different classes.

LDO: What is likely to be involved in PFAS restriction under the Roadmap?

Senecal: The "restrict" portion directs the various EPA offices to build on the research and generate restrictive measurements for the various PFAS classes. For example, if warranted by the toxicology, the EPA could regulate certain classes of PFAS as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability (CER-CLA). Once that happens, the EPA Office of Water could generate national

maximum concentration limits for drinking water, wastewater effluent and industrial wastewater discharges.

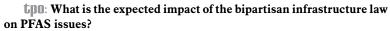
LDO: How would the Remediate side of the Roadmap play out?

Senecal: Once the "restrict" portions are completed, a national strategy would require testing for PFAS in any potable water supply that serves more than 3,000 residents. Once testing demonstrates the presence of certain classes of PFAS above a prescribed level, a municipality would be required to communicate that to the public and initiate remediation. Classification as a hazardous substance could make the remediation eligible for the Superfund program.

LDO: What challenges would a remediation program pose for a municipality?

Senecal: When PFAS contamination pops up, it's a tough and time-sensitive issue for a municipality to deal with. Once contamination is discovered, they need to

work quickly and communicate very carefully about what is going on. It's essential to pull in and work with health and environmental agencies to arrive at a solution that is sound, well communicated and online as soon as possible.



Senecal: We believe a lot of money will flow into communities with demonstrated needs. The money will flow through state revolving loan

time-sensitive issue for a municipality to deal with."





Greg Senecal



Dan Noll



Keith Garbrick

funds and through grants. The key for municipalities is to be ready. If they anticipate a need to avail themselves of the funding, leaders should be conducting engineering studies now to demonstrate the need and getting that into their capital plans for when the money becomes available.

LDO: What treatments have been proven effective in removing PFAS from water? (continued)



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At present there are three basic technologies for PFAS treatment: high-pressure membrane filtration, granular activated carbon, and ion exchange."

DAN NOLL

Noll: At present there are three basic technologies for PFAS treatment: high-pressure membrane filtration, granular activated carbon and ion exchange. Typically, one of these would be implemented on the back end of a treatment process to polish the water and address PFAS issues. The "remediate" portion of the EPA Roadmap calls for studies to explore developing other treatment technologies.

LPO: What form of membrane treatment would be the most applicable to PFAS?

Noll: Nanofiltration and reverse osmosis are the most effective. They are among the best methods for addressing PFAS, but they do have the drawback of creating a waste stream. These technologies work by separating out the contaminants from the water. That leaves about 10-20% reject water that concentrates whatever contaminants are removed. The reject water then has to be dealt with. Membrane treatment may not be the most cost-effective method; it is typically used on a smaller-scale municipal plants.

LDO: What are the pros and cons of granular activated carbon?

Noll: At present, granular activated carbon is the most widely used. It is the simplest and often the most cost-effective, but that depends on site specifics, such as daily flows, and what might be in the water. Activated carbon can be deployed rapidly by using point-of-entry treatment, where small units are installed at households until a full-scale system can be put in place. One drawback is that activated carbon is not effective for all PFAS compounds. It's effective for longer-chains molecules, but less so for shorter chains. And the spent carbon has to be regenerated or sent out for disposal.

LDO: What are the benefits and limitations of ion exchange?

Noll: Ion exchange is not as cost-effective as carbon, although again that depends on the specific situation. In ion exchange, the positively charged resin captures the negatively charged PFAS molecules. There is also the manner of disposing of the spent resin.

Garbrick: We see industries popping up to explore capturing that ion exchange waste stream and turning to beneficial use. We're currently working with one industry that is able to pull out some organic compounds which they condense down and mix with fertilizers to increase crop yields. The dissolved organic matter is used as a biostimulant for fruit and vegetable crops and for row crops, increasing yields 5-25%.

CPO: What are the implications of PFAS treatment for water and wastewater treatment plant operators?

Noll: The biggest thing is that there will be a need for sampling; some of that is already required and underway on the drinking water side. The sampling is not difficult, but there are some very specific things operators need to be careful of. For example, they should not wear a new GORE-TEX jacket that could have PFAS on it while collecting a sample; that could yield a false positive result. There also would be capital improvement projects to treat the water, and the ongoing maintenance and monitoring of any system.

LDO: Are there any issues specific to wastewater operations?

Noll: The discharges from wastewater treatment plants eventually will start requiring NPDES permits to investigate whether there is a need to do some effluent polishing at the discharge. There may also be issues on the biosolids side that affect plant operations and the land application or disposal of the material.



LPO: If in need of expertise in dealing with a PFAS issue, what factors should a municipality consider?

Senecal: A firm helping a municipality needs to investigate, gather and verify accurate data, and get out in front of the issue quickly. It should be able to drill wells, do sampling, remove sources of PFAS in soils and set up construction systems. It's also important to have experience in aquifer testing and determining where the PFAS are coming from, because often the best temporary solution is install a new well or group of wells in an area not affected by PFAS. Finally, there should be expertise in the design and construction of treatments that work with the community's existing potable water system.

LPO: Can you describe a couple of cases where your firm dealt successfully with a PFAS problem?

Noll: In Newburgh, New York, we worked under a contract with the state Department of Environmental Conservation to install point-of-entry treatment systems to address the immediate need and get acceptable drinking water to residents. Meanwhile we designed and built a full-scale granular activated carbon system to address the PFAS in the groundwater.

Senecal: We went from the point-of-entry systems to a 6 mgd supplemental add-on to the water treatment plant within six months. It's about coordination and getting access to funding almost in an emergency fashion and making sure the team thinks through the problem to provide a well-engineered, long-term, safe solution. **tpo**



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WASTEWATER

By Rick Lallish

When operating a belt filter press, alignment is critical for proper operation and safety. What system normally accomplishes this operation?

- A. Tension-alignment system
- B. Belt tracking system/automatic sensing arm
- C. Integrated SCADA controls
- D. This is manually controlled by the press operator

ANSWER: B. Belt filter presses can achieve excellent dewatering when operating properly. Belt tension and alignment are critical for keeping both belts in proper alignment and maintaining necessary tension. If the belt tracking system fails, the belts may travel off the tracks/wheels, and unit failure may occur. This is prevented by a system of automatic sensing alarms that limit the travel of each belt to the left or right. Tension is important as well, as increased belt tension may result in higher cake percent solids but possibly cake extruding from the sides of the unit. Also, increased belt tension may decrease belt life. More information may be found in the WEF textbook, *Wastewater Treatment Fundamentals II – Solids Handling and Support Systems*, Chapter 5.

DRINKING WATER

By Drew Hoelscher

How many repeat bacteriological (total coliform) samples should an operator collect if a routine bacteriological sample is total coliform positive?

- A. 1
- B. 2
- C. 3
- D. None. Repeat samples are only required if the sample tests positive for *E. coli*

ANSWER: C. Routine and repeat bacteriological samples are collected from approved sample site locations throughout the distribution system and analyzed for total coliform. Typically, utilities monitor total coliform every month by collecting the appropriate number of routine samples throughout the sampling period. If a routine sample tests positive for total coliform, the operator must collect three repeat samples within 24 hours of being notified. Repeat samples must be collected from the original site, within five service connections downstream, and within five service connections upstream from the original site. An alternative sample location can be proposed to the governing agency if it is likely to better represent a pathway for contamination.

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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Old and Yet Modern

UPGRADES IN TECHNOLOGY, MONITORING AND MAINTENANCE KEEP VICKSBURG'S WATER PLANT CHURNING OUT A QUALITY PRODUCT AND EARNING AWARDS FOR EXCELLENCE

STORY: David Steinkraus | PHOTOGRAPHY: Andrew Welch

here was much to be done when ESG Operations took over the water plant in Vicksburg, Mississippi. After six years and many upgrades, the plant now turns out some of the best water in the state and is a consistent award winner.

From 2019 through 2021, the Vicksburg team received the Plant of the Year award from the Alabama-Mississippi Section AWWA. "I've tried for that award almost every year since I've been here," says Eddie Busby, operations manager for five years under ESG, which received the contract from the city in 2016.

Along the way, the team also won the 2020 Best Drinking Water Award from the Mississippi Rural Water Association. "Our water is very hard here," Busby observes. "It blows me away that we get the water quality we do with this process, but it works."

In large part, the plant functions well because of various upgrades and modernizations in recent years in a plant built in 1969.

RICH IN IRON

The plant draws water from 17 wells. The raw water first undergoes aeration to oxidize iron, and hydrogen sulfide and carbon dioxide are released to the atmosphere at the same time. Raw water

hardness is 240 to 340 ppm, and the iron concentration is 7 to 8 ppm.

"I have four wells that are super hard," says Busby. "The rest of them, I consider them soft wells, but the iron is still high." When he pumps from one of the super-hard wells, he also pumps from two or three others to blend the water and reduce chemical needs.

After aeration, slakers (Integrity) add quick lime, increasing the pH increases to about 10. Iron attaches to the lime floc, settles in two 1 million-gallon clarifiers (Ovivo), and is drawn off with the sludge.

A timer releases sludge into a pit where a pair of pumps (Penn Valley) move it into a thickening tank for settling. Another pair of pumps (also Penn Valley) move the sludge into a plant for addition of polymer and dewatering on two belt presses (Andritz). Trucks haul away the cake for application on farmland.

Carbon dioxide is added to the water to drop the pH to about 8.5. Liquid chlorine feeders (Hydro Omni) provide disinfection, and water flows through a standard filter comprised of anthracite, sand and gravel before moving into the distribution system. The plant normally runs on one clarifier, but if demand is heavy, both are used.



The team at the Vicksburg Water Treatment Plant includes, from left, Eddie Busby, project manager; Robert Sanders, Dennis Hicks and Barry Renfrow, Class A operators; Willie Flagg, sludge plant operator; Candace Grimshel, administrative assistant; Roger Lester, maintenance manager; and Wayne Andrews, operator in training.

C Our water is very hard here. It blows me away that we get the water quality we do with this process, but it works." **EDDIE BUSBY**



www.vicksburg.org/utilities/page/ water-treatment-plant

BUILT: 1969

POPULATION SERVED:

22,000

TEAM MEMBERS:

16 mgd design, 5.6 mgd average

SOURCE WATER:

17 wells

SYSTEM STORAGE:

1.6 million gallons

DISTRIBUTION:

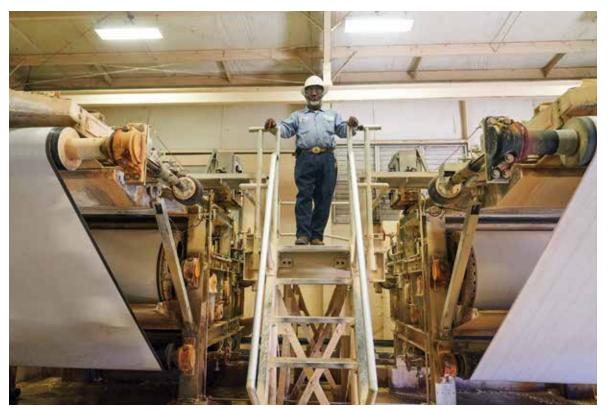
26 miles of water mains

ANNUAL BUDGET:

\$3.4 million (operations)

KEY CHALLENGE:

Attracting and retaining quality team members



Willie Flagg with the plant's Andritz belt presses. Dewatered biosolids are sold to farmers as fertilizer and soil conditioner.

PANDEMIC BENEFIT

Busby's team includes Barry Renfrow, Dennis Hicks and Robert Sanders, Class A operators; Wayne Andrews, operator in training; Willie Flagg, sludge plant operator; Roger Lester, maintenance supervisor; Andrew Ahlvin, maintenance technician; and Candace Grimshel, administrative assistant. The plant is staffed 24 hours a day, seven days a week.

MANAGING FOR DISASTER

As the crow flies, Vicksburg is about 170 miles north of New Orleans, in hurricane country. Storms sweeping off the Gulf of Mexico roll past Vicksburg on their way inland.

"We've had roofs torn off the main building," says Eddie Busby, water plant project manager for ESG Operations. Hurricane Ida, which plowed across the state on Sept. 1, 2021, wasn't a bad one for the Vicksburg plant. The storm center passed to the east, and lesser amounts of rain typically fall on the west side of the center.

When a storm heads for his area, Busby runs through standard preparations. He checks that the fuel tanks on the emergency generators are full. That means loading up on chemicals, filling the lime silos and liquid chlorine tanks, and topping off all vehicle and equipment fuel tanks. "That's basically all you can do," he says.

Operators try to keep the elevated water tanks and the plant clear well full so the system has more time to recover from any interruption. Busby and Roger Lester, maintenance supervisor, live within 15 to 20 minutes of the plant.

With preparations made and a storm coming, the only thing they can do is wait. Says Busby, "I'm in constant contact with operators, and they call me immediately if something happens." When we came here, there was just a control panel with switches. Now we have a full SCADA system."

Like many water plants around the country, Vicksburg has trouble finding people who want water jobs. The pandemic eased that problem for the city because two college graduates couldn't find suitable work elsewhere.

Sanders, who has degrees in microbiology and chemistry, was working part time at the city swimming pool when a co-worker suggested he talk to Busby. The wastewater division hired Ronni Wolfe, who has a degree in chemical engineering and is engaged to Sanders' brother.

"Both of them have really bright futures," Busby says. "I'm pushing

them just as hard as I can, and they like what they're doing. They never thought about working in a water plant."

Busby emphasizes education and licensing for his team. "I've got three Class A's in this water plant, and that's almost unheard of in Mississippi," he says. "We go to conferences in Mobile, Alabama, and it's all older people. They're about ready to walk out the door, and there's no one to take their place."

KEEPING UP TO DATE

The plant has been through a number of upgrades under ESG's leader-ship. "This plant is 50 years old, and a lot of the equipment is manual," Busby says. "When we came here, there was just a control panel with switches. Now we have a full SCADA system that monitors our tanks and turns the wells on and off."

Busby chose to limit what can be done with the system. He could monitor operation from home and even control the plant, but given the prevalence of computer hacking, he considers the risk to the plant and public is too great.

As further insurance against production upsets, the team has revamped procedures for power outages; there is a risk of hurricanes rolling in from the Gulf of Mexico about 200 miles south.

There are no automatic transfer switches; wiring is not set up for them, and all 17 wells, just across the road, are fed by the same power line from the water plant. To disconnect from the grid, an operator must



The Vicksburg team received the Alabama-Mississippi Section AWWA Water Treatment Plant of the Year award three years running.

pull a lever on one utility pole, pull another switch on the next utility pole, and manually start the emergency generators. (continued)





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The pandemic brought college graduates to the plant in search of work, including Robert Sanders, who has earned degrees in microbiology and chemistry.

Each operator, every day, charts the pH and the chlorine where they can physically see it in the room."

EDDIE BUSBY

The old procedure required operators to call the electric utility before switching to the generators. "And getting to the power company during a storm — it's hard to get through," Busby says.

PRINTED REFERENCE

To help monitor equipment, a board shows the status of every piece of equipment in the plant. Check marks show whether machines are running or require repair. "That way all the operators in the plant know at a glance what's working and what's not," Busby says.

Data plays an important role. State rules specify testing of the water every six hours; Vicksburg technicians test every two hours. Data is entered into the computer system along with information such as the day and time when instruments were calibrated. Anomalies are flagged by the system. Managers at the ESG corporate office can see this information, and area managers receive messages if something is out of specification.

A computerized maintenance management system covers every piece of equipment, along with a picture and the manufacturer's maintenance instructions; the software generates a unique identifying number. When maintenance or replacement is due, the system generates a work order.

"One of those well motors, if it burns up, that's \$70,000," says Busby. "You've got to take care of the equipment." Spares are on site for about 90% of the equipment. Although there is an effort to minimize paper, there is an exception favored by ESG's owners: Trend charts are printed and hung on a wall.

"Each operator, every day, charts the pH and the chlorine where they can physically see it in the room," Busby says. "It's not like someone putting data into a computer and not seeing a trend. If something does go south, most of the time you can see something happening a little bit before on a trend chart."



Eddie Busby credits Vicksburg city officials with supporting the plant team's initiatives to upgrade and modernize. He's shown walking up to the clarifiers, with lime storage tanks in background (lime slaking system from Integrity Municipal Systems).

FACILITY PLANNING

In Busby's five years at the plant, the city has spent about \$10 million on upgrades: "A lot of the equipment, you couldn't buy parts to fix anymore." Credit for the upgrades goes to the city, which recognized the need and committed to spending the necessary funds, he says.

The future of the Vicksburg plant is in flux. City officials want to build a port for the community, and they're looking to do that on the city's south end on the Mississippi River. The water plant is on the north end, on an arm of the Yazoo River, and its space is limited by the river and businesses around it.

A number of feasibility studies have been done for the port project. "If that happens, then we will have to do something else, either add to our capacity or put some wells in down on that end of town," Busby says. "From what they're telling me, we won't be able to handle the demand from that industry if they build a port."

That will be the key factor in deciding what happens with the plant. Busby observes, "With all the modifications we've done, this plant should be able to last the city another 15 years with no problem." **tpo**

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Students Showcase Water Posters

KIDS FROM THE FLORIDA TOWN OF DAVIE ARE REGULAR ENTRANTS IN A WATER AWARENESS AND CONSERVATION POSTER CONTEST SPONSORED BY THE FLORIDA AWWA SECTION

By Sandra Buettner

or the past six years the Town of Davie has been a state-recognized winner of the AWWA Florida Section children's water poster contest.

The Drop Savers Water Conservation Poster Contest is open to grades K-12. "Being recognized at the state level is a real testament to the creativity and commitment of the students and educators in our community to the preservation of the earth's natural resources," says Renuka Mohammed, utilities director.

Davie (population 105,000) lies 24 miles north of Miami. It has two drinking water treatment plants with a total 10 mgd capacity. One plant draws water from the shallow Biscayne Aquifer and the other from the deep Floridian Aquifer.

RULES AND REGS

Children are encouraged to create posters showing their idea of water conservation in slogan or drawing form, or both, on a standard sheet of white paper. They can use paint, crayons, colored pencils or markers, but no highlighters, photos or computer graphics.

The poster contest promotes the importance of water conservation in homes and in daily routines. Posters are judged in five divisions:

- 1. Grades K-1
- 2. Grades 2-3
- 3. Grades 4-5
- 4. Grades 6-8
- 5. High school

The students must create the posters with no help from family or friends.

Being recognized at the state level is a real testament to the creativity and commitment of the students and educators in our community."

RENUKA MOHAMMED

The contest begins in January, and all entries must be submitted by Earth Day in April.

PROMOTING THE PROGRAM

The Davie Utilities Department works with K-12 art and science teachers to ensure the program's success. To encourage participation, the utility delivers drawing paper to the schools, and staff members are available to answer any questions.

The town works with AWWA and the South Florida Water Management District to provide water conservation materials, posters and flyers to the children and educators. SFWMD is a regional agency that manages the water resources in the southern half of Florida, covering 16 counties from Orlando to the Florida Keys; it serves a population 9 million.

2021 marked the contest's 24th year; Davie has taken part for the past six years. The initiative was championed by Isabella Slagle, the town's former compliance specialist. "Our employees, the students and the teachers really enjoy this contest," says Mohammed. "It's a nice way to connect with the schools to promote water conservation in a fun and creative way."

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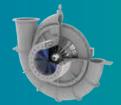
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JUDGES AND PRIZES

Judging for the Davie entries is open to all utility employees. The posters are displayed in the administration building, and the judges rate them on creativity, messaging and originality. Natural artistic ability is not a requirement. First place winners from the five divisions are recognized by the town, and their posters are displayed in the town hall.

Winners receive a gift bag that includes a certificate, gift cards, water bottles, school supplies and water conservation educational materials. The items are donated by businesses such as Publix Super Markets, ACE Educational Supply Store, Dairy Queen, utility vendors and utility engineering consultants. Teachers are recognized during the town hall meeting and receive water conservation materials to use in their classrooms.

In previous years, winners have been recognized at town council meetings. In 2021, during the COVID-19 pandemic, the schools along with teachers and students were notified by telephone and email of the recognition. The student winners received their prize bags by mail.

The winning posters from the local contest go on to the Florida AWWA state competition. The first, second and third place winners from each division receive \$100, \$75 and \$50 gift cards. All participants receive a \$15 gift card, and the judges and volunteers receive a coffee mug with the image of the winners. tpo

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An End to Manual Clarifier Weir Cleaning



AUTOMATING ALGAE CONTROL IN CLARIFIERS, THICKENERS AND SIMILAR TANKS CAN DRAMATICALLY AND COST-EFFECTIVELY IMPROVE SAFETY AND EFFICIENCY

By Del Williams

lean-water plant operators have long resigned themselves to the laborious and dangerous process of manually cleaning algae, grease and other material from the weirs, baffles and troughs of clarifier and thickener tanks.

Algae growing almost exponentially, especially in summer, can accumulate at a surprising rate and eventually even affect the tank functions. Manual washdowns still occur in part because the wastewater industry has always done it that way; many operators do not know that more effective solutions exist that are affordable, easy to install and fully automated.

"Today, there are solutions that use pressurized water to break up algae for easy removal," says Kenny Martin, CEO of Contract Management Service, a Florida-based company specializing in wastewater and water treatment plant repair and maintenance. "These systems can be tied into plant automation to eliminate operator involvement and free those workers for more important tasks."

MANUAL HAZARDS

Martin, who has visited thousands of U.S. wastewater treatment facilities, observes, "If a tank is not properly maintained, you will begin to see algae strings on the surface and the weirs.

Wastewater plants can run the automated system two to three hours a day. It turns off automatically and resumes cleaning the next day."

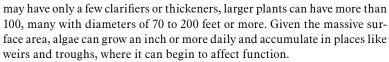
"The accumulation of algae can prevent water from spilling over the weirs as required, and that can impact the entire plant. Once the algae gets out of control, it can form a floating pad or even an 'algae island."

Manual washdowns are fraught with unnecessary cost and safety risks. Breaking up and removing algae typically requires two workers, often for several hours per day. Those workers climb into the tanks, where they are exposed to wastewater that contains pathogens and hazardous substances.

Slippery, algae-covered surfaces have caused operators to fall into tanks, where sharp metal edges and other features cause injury and even death. Then there is the matter of the labor cost, along with the difficulty of finding qualified operators, who are not fond of this essentially menial task.

A GROWING PROBLEM

Although small wastewater plants



Delayed cleaning only makes the situation worse. Over time, algae accumulates and hardens, making it much more difficult to eliminate. Once algae builds up, it provides a growing medium for other types of algae, mosses and fungi, and can trap grease and scum as well.

Without continual cleaning, the amassed algae growth and particulates form a thick mat that can require using ice chippers, scrapers and shovels to break off and remove.

Failing to remove the algae buildup from a clarifier for as few as five days can clog it to such a degree that it becomes essentially nonfunctional.

Alternatives to manual washdowns, such as automated brushes, chlorine tablets and weir covers, have often proven ineffective. For example, bristles of brushes can clog so that they are unable to break up the algae until they are cleaned. Algae can grow under weir covers and still must be periodically removed.

AUTOMATED CLEANING

Martin notes that the wastewater industry increasingly looks to systems engineered to remove algae automatically, safely and efficiently. One automated cleaning system in particular is designed to remove algae, grease, scum, sludge, foam and other materials from the weirs, baffles and launders in clarifiers, thickeners and similar tanks. (continued)



Automated algae control systems, like the WeirWasher cleaning system, can dramatically improve safety and efficiency.

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The automated system uses a dual dynamic spray design that rotates a solid stream of nonpotable plant water over all the clarifier surfaces that need to be cleaned. In this noncontact configuration, the water is designed to penetrate 10 to 14 inches below the surface to break up algae even at lower pressures from 50 to 70 psi.

Each weir washer system is custom engineered for its tank to maximize cleaning and to accommodate almost any clarifier or thickener configuration. Systems can include a diverse range of multinozzle and dual dynamic spray devices to suit each application.

The fully automated approach minimizes labor and potential liability costs by providing consistent, effective daily cleaning and the prevention of large algae blooms.

PUTTING IT TO WORK

"Wastewater plants can run the automated system two to three hours a



To break up and remove algae from wastewater tanks, two workers are typically required, often for several hours per day.



Automated weir washers remove algae, grease, sludge and other materials from the weirs, baffles and launders in clarifiers, thickeners and other tanks.

day," says Martin. "It turns off automatically and resumes cleaning the next day. When you compare a clarifier that has an automated water-powered washing system with one that is manually cleaned, after a month the difference between the two is striking."

Automated systems function similarly with round, square and rectangular clarifiers. Equipped with a center pier or travelling bridge/chain and flight, they can clean all trough geometries and configurations, including as multisided troughs, troughs with internal supports, concrete/pipe supported obstructions and other designs.

Because wastewater plants exist in a dynamic environment where volumes and effluent quality can vary based on the season and other factors, the automated weir cleaning system is designed to adapt to the required facility capacity. The addition of a booster pump can maximize results if system pressure needs boosting or pressurized water is not available at the tank.

Although wastewater plants have long resorted to manual methods to clean algae from clarifiers and other tanks, the time has come to consider safer, OSHA-compliant, automatic solutions that significantly improve operation and lower maintenance costs.

ABOUT THE AUTHOR

Del Williams wrote this article on behalf of GillTeq (info@gillteq.com), a manufacturer of automated cleaning systems for wastewater treatment facilities, pulp and paper mills, and chemical plants. tpo



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Let's face it, there's never a good time for failed equipment, especially when it's preventable. Clogged pumps lead to downtime, and downtime leads to frustration, to say the least. With thousands of installations solving clogging issues, the XFP submersible pumps, utilizing the Contrablock Plus system, have proven themselves to prevent problems before they even start. With superior solids and rag handling and lower maintenance costs for long-term reliability, the choice is easy when it comes to replacing your failing equipment.

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industry news

Centrisys secures maintenance contract, announces new COO

Centrisys announced it has secured a contract with the New York City Department of Environmental Protection to provide maintenance and repairs for 83 existing decanter centrifuges located in eight NYC wastewater treatment facility locations. Centrisys' contract was bid in partnership with Jett Industries, a general contractor focused on constructing and modifying water and wastewater treatment facilities.



Madhavi Batchu

The company also announced Madhavi Batchu has been promoted to chief operating officer. Batchu is a 17-year veteran of the wastewater industry and joined Centrisys/CNP in 2014, establishing the company's applications engineering department. In her new role as COO, she is responsible for the overall operations of Centrisys/CNP. She will work directly with CEO and President Michael Kopper, Vice President of Product Development George Kueppers, Chief Financial Officer Gary Stinson, and other internal teams to develop and implement the strategic vision and values of the Centrisys/CNP organization.

Franklin Electric announces recipients for outstanding achievements

At Franklin Electric's annual Commercial Summit — a gathering of team members from across its operations — winners of this year's awards for outstanding performance, sales and customer support were announced. The winners named were Field Salesperson of the Year, Jimmy Vela; Field

Service Engineer of the Year, Ryan Horner; and Team of the Year, U.S. South Central Region. The team members, led by Darol Hayes, included Chase Ellsworth, Dave Batdorff, Erasmo Barron, Ilse Gallegos, Jennifer Ford, Jesse Zwiebel, Jimmy Vela, Hannah Kiningham and Woody Kunkel.

Grundfos and EKF sign financing partnership agreement

Grundfos and EKF Denmark's Export Credit Agency have entered into an agreement that enables Grundfos to finance projects globally for private commercial and public customers with limited funds. The agreement could also help customers meet their goals for reduced carbon emissions. Under the agreement, private commercial and public customers can receive financing on projects above \$570,129 for up to five years directly through Grundfos. EKF will provide Grundfos a credit guarantee covering 50% of the credit exposure, reducing the risk in financing such projects.

Xylem appoints Mark Morelli to board

Xylem has appointed Mark Morelli to the company's board of directors, effective Feb. 3. Morelli currently serves as president and CEO of Vontier Corp., a global industrial technology company focused on smarter mobility. Previously, he served as president and CEO of Columbus McKinnon, COO of Brooks Automation, CEO of alterna-



Mark Morelli

tive energy company Energy Conversion Devices, and president of United Technologies. **tpo**

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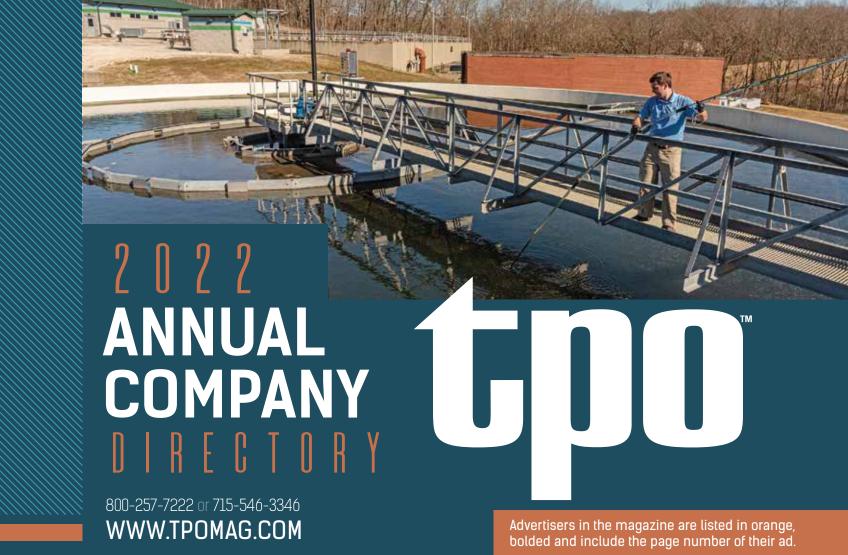












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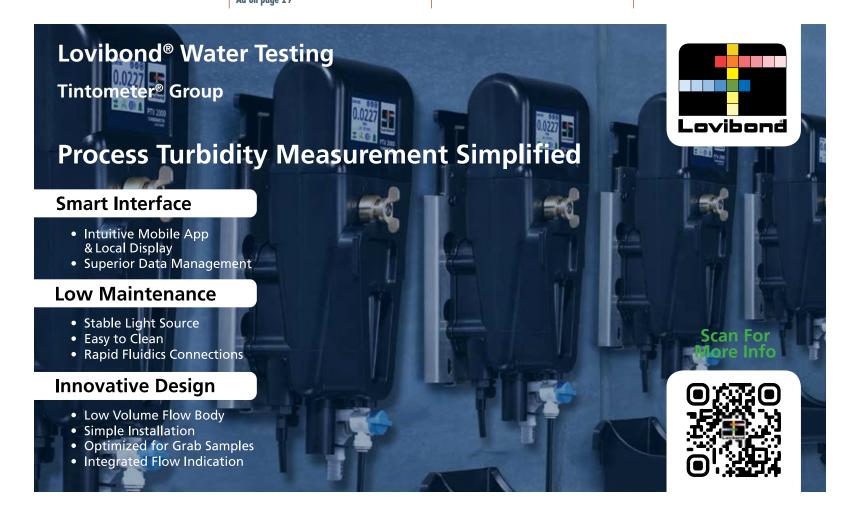


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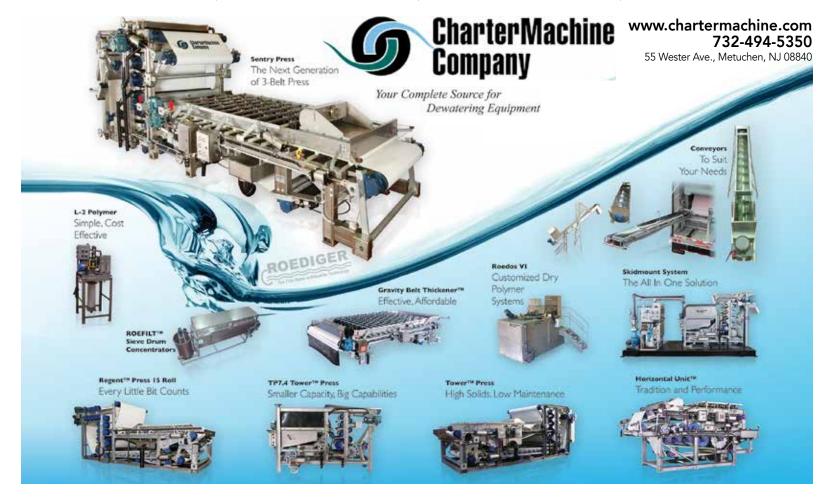
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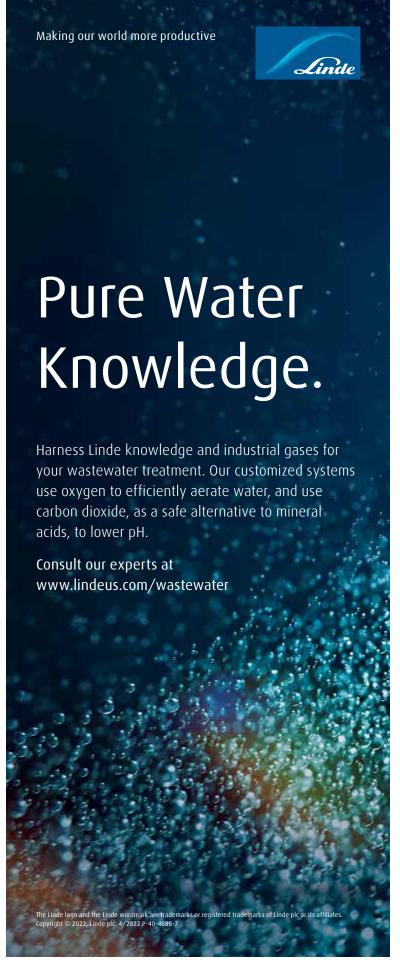
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inquiries.usa@howden.com

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www.centrisys-cnp.com

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USP Technologies

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JDV Equipment Corporation

973-366-6556 • Fax: 973-366-3193 sales@idvequipment.com www.jdvequipment.com Ad on page 41

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Danbury, CT 844-445-4633 • 630-320-4000 • Fax: 630-320-4508 contactus@linde.com www.lindeus.com/wastewater Ad on page 75

Mazzei Injector Company, LLC

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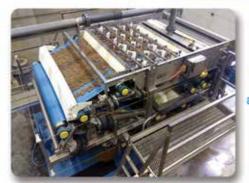


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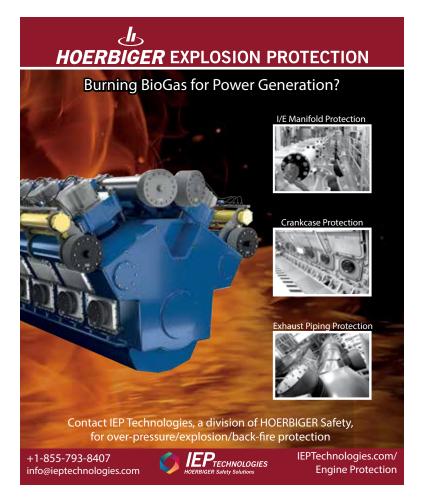
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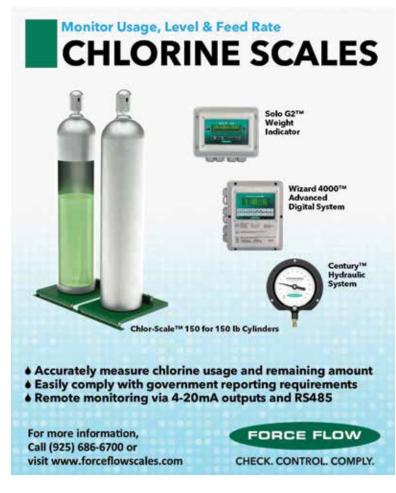
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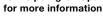
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Largo, FL 888-473-9546 • 613-938-8956 northamerica@pulsarmeasurement.com www.pulsarmeasurement.com Ad on page 53

Seametrics

Kent, WA 800-975-8153 • 253-872-0284 • Fax: 253-872-0285 info@seametrics.com www.seametrics.com

Sensorex

Garden Grove, CA 714-895-4344 marketing@sensorex.com www.sensorex.com

Sierra Instruments, Inc.

Monterey, CA 831-373-0200 • Fax: 831-373-4402 sales@sierrainstruments.com www.sierrainstruments.com

YSI, a Xylem brand Yellow Springs, OH

800-765-4974 • 937-767-7241 info@vsi.com www.ysi.com Ad on page 9

Septage Receiving Stations

CleanTek Water Solutions

Fridley, MN 866-929-7773 info@cleantekwater.com www.cleantekwater.com

Duperon Corporation

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JDV Equipment Corporation

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JWC Environmental Inc.

Santa Ana. CA

800-331-2277 • 949-833-3888 • Fax: 714-242-0240 iwce@iwce.com www.jwce.com Ad on page 27



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815-636-8306 • Fax: 847-672-7968 www.savecowaterna.com Ad on page 4

ScreencO Systems

ScreencO Systems LLC

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Sequencing Batch Reactors

Alfa Laval

Richmond, VA 866-253-2528 customerservice.usa@alfalaval.com www.alfalaval.us



Agua-Aerobic Systems, Inc.

Loves Park, IL 800-940-5008 • 815-654-2501 • Fax: 815-654-2508 solutions@aqua-aerobic.com www.aaua-aerobic.com Ad on page 11

Evoqua Water Technologies LLC

Pittsburgh, PA 800-466-7873 • 724-772-0044 www.evoqua.com



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Houston, TX 832-532-3112 • Fax: 832-532-3115 info@lonestarblower.com www.lonestarblower.com

Parkson Corporation

Ft. Lauderdale, FL 888-727-5766 • 954-974-6610 • Fax: 954-974-6182 technology@parkson.com www.parkson.com

Seven Seas Water Group

Tampa, FL 813-855-8636 info@7seaswater.com www.sevenseaswater.com

Xylem

Charlotte, NC 855-995-4261 www.xylem.com Ad on page 5

Service Company

Centrisys/CNP

Kenosha, WI 262-747-2384 info@centrisys-cnp.com www.centrisys-cnp.com

F&V Operations and Resource Management

Grand Rapids, MI 888-773-8806 • 616-588-2900 • Fax: 616-977-1005 bselover@fv-operations.com www.fv-operations.com

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Coolidge, GA 877-994-8778 • 229-346-3545 • Fax: 229-346-3874

info@hurstboiler.com www.hurstboiler.com

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Mesa, AZ 480-986-1212 info@jpciservices.com www.jpciservices.com

Skimmers

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Jim Myers & Sons, Inc.

Charlotte, NC 704-554-8397 • Fax: 704-554-9113 sales@jmsequipment.com www.jmsequipment.com

Park Process

Houston, TX 855-511-7275 • 713-849-7124 • Fax: 713-937-4254 rcaughman@park-usa.com www.parkprocess.com

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Sludge - Collectors/ Measurement

Hawk Measurement

Medina, OH 888-429-5538 • 978-304-3000 • Fax: 978-304-1462 info@hawkmeasure.com www.hawkmeasurement.com

In-Situ Inc. (ChemScan, Partech)

Ft. Collins. CO 800-446-7488 info@in-situ.com www.in-situ.com Ad on page 81

Pulsar Measurement

Larao. FL 888-473-9546 • 613-938-8956 northamerica@pulsarmeasurement.com www.pulsarmeasurement.com Ad on page 53

Sludge -**Dewatering/Presses**

Alfa Laval

Richmond, VA 866-253-2528 customerservice.usa@alfalaval.com www.alfalaval.us







AQUA-Zyme Disposal Systems, Inc.

Van Vleck, TX 979-245-5656 zymme@aqua-zyme.com www.agua-zyme.com Ad on page 71

Aqualitec Corp.

Los Angeles, CA 310-703-2174 info@aqualitec.com www.aqualitec.com

BDP Industries, Inc.

Greenwich, NY 518-695-6851 • Fax: 518-695-5417 dan@bdpindustries.com www.bdpindustries.com Ad on page 31



Bright Technologies, **Division of Sebright Products, Inc.**

Hopkins, MI 800-253-0532 • 269-793-7183 • Fax: 269-793-4022 julie@sebrightproducts.com www.brightbeltpress.com Ad on page 79

Centrisys/CNP

Kenosha, WI 262-747-2384 info@centrisys-cnp.com www.centrisys-cnp.com



Charter Machine Company

Metuchen, NJ 732-548-4400 walterk@chartermachine.com www.chartermachine.com Ad on page 67

Clean Water Technology

Gardena, CA 310-380-4648 info@cwt-global.com www.cwt-global.com

E & I Corporation

a Div. of McNish Corporation

Westerville, OH 614-899-2282 • Fax: 614-899-0304 info@eandicorp.com www.eandicorp.com Ad on page 77

ELODE USA, Inc.

Norwood, NJ 201-568-7778 alexm@elodeusa.com www.elodeusa.com Ad on page 61

Evoqua Water Technologies LLC

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FKC Co., Ltd.

Port Angeles, WA 360-452-9472 • Fax: 360-452-6880 mail@fkcscrewpress.com www.fkcscrewpress.com

Flottweg Separation Technology, Inc.

Independence, KY 859-448-2331 sales@flottweq.net www.flottweg.com

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Komline-Sanderson

Peapack, NJ 800-225-5457 • 908-234-1000 • Fax: 908-234-9487 info@komline.com www.komline.com Ad on page 25



Park Process

Houston TX 855-511-7275 • 713-849-7124 • Fax: 713-937-4254 rcauahman@park-usa.com www.parkprocess.com Ad on page 101



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Sanford, FL

513 503-0781 • 513 275-4720 info.northamerica@pieralisi.com www.pieralisi.com Ad on page 91

Press Technology & Mfg., Inc.

Springfield, OH 937-327-0755 dberner@presstechnology.com www.presstechnology.com

Schwing Bioset, Inc.

Somerset, WI 715-247-3433 • Fax: 715-247-3438 marketing@schwingbioset.com www.schwingbioset.com

Sludge - Drvers

BCR, Inc.

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Metuchen, NJ 732-548-4400 walterk@chartermachine.com www.chartermachine.com Ad on page 67

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Norwood, NJ 201-568-7778 alexm@elodeusa.com www.elodeusa.com Ad on page 61

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Cambridge, MD 800-453-8616 • 410-221-8431 sales@akdusa.com www.gkd-group.com

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Multiple Hearth Services, IFCO

Rochester, NY 800-525-7933 • 585-654-3018 • Fax: 585-288-1257 wlill@industrialfurnace.com www.industrialfurnace.com

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Schwing Bioset, Inc.

Somerset, WI 715-247-3433 • Fax: 715-247-3438 marketing@schwingbioset.com www.schwinabioset.com

Veolia Water Technologies

Cary, NC 919-677-8310 usmunicipal@veolia.com www.veoliawatertech.com

Sludge - Hauling/Disposal

AQUA-Zyme Disposal Systems, Inc.

Van Vleck, TX 979-245-5656 zvmme@aaua-zvme.com www.aqua-zyme.com Ad on page 71

Kuhn North America, Inc.

Brodhead WI 608-897-2131 • Fax: 608-897-2561 chris.searles@kuhn.com www.kuhn-usa.com Ad on page 9

Sludge - Heaters

CleanTek Water Solutions

Fridley, MN 866-929-7773 info@cleantekwater.com www.cleantekwater.com



HRS Heat Exchangers Marietta, GA 770-726-3540 info@us.hrs-he.com www.hrs-heatexchangers.com

Hydro-Thermal Corporation

Waukesha, WI 800-952-0121 • 262-548-8900 info@hydro-thermal.com www.hydro-thermal.com Ad on page 59

Multiple Hearth Services, IFCO

Rochester, NY

800-525-7933 • 585-654-3018 • Fax: 585-288-1257 wlill@industrialfurnace.com

www.industrialfurnace.com

Pick Heaters, Inc.

West Bend, WI 262-338-1191

info1@pickheaters.com www.pickheaters.com

Sludge - Hydrolysis

Centrisys/CNP

Kenosha, WI 262-747-2384 info@centrisys-cnp.com

www.centrisys-cnp.com

Sludge - Mixers/Thickeners

Alfa Laval

Richmond, VA 866-253-2528

customerservice.usa@alfalaval.com

www.alfalaval.us

Centrisys/CNP

Kenosha, WI 262-747-2384 info@centrisys-cnp.com

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ELODE USA, Inc.

Norwood, NJ 201-568-7778

alexm@elodeusa.com

www.elodeusa.com

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FKC Co., Ltd.

Port Angeles, WA

360-452-9472 • Fax: 360-452-6880

mail@fkcscrewpress.com www.fkcscrewpress.com

Flottweg Separation Technology, Inc.

Independence, KY 859-448-2331

sales@flottweg.net www.flottweg.com

HUBER Technology, Inc.

Denver, NC

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JDV Equipment Corporation

Dover, NJ

973-366-6556 • Fax: 973-366-3193

sales@jdvequipment.com

www.jdvequipment.com

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jwce@jwce.com

www.jwce.com

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Komline-Sanderson

Peapack, NJ

800-225-5457 • 908-234-1000 • Fax: 908-234-9487

info@komline.com

www.komline.com Ad on page 25

Kuhn North America, Inc.

Brodhead, WI

608-897-2131 • Fax: 608-897-2561

chris.searles@kuhn.com

www.kuhn-usa.com Ad on page 9

Parkson Corporation

Ft. Lauderdale, FL

888-727-5766 • 954-974-6610 • Fax: 954-974-6182

technology@parkson.com

www.parkson.com

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Sanford, FL

513 503-0781 • 513 275-4720

info.northamerica@pieralisi.com

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Press Technology & Mfg., Inc.

Springfield, OH

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dberner@presstechnology.com

www.presstechnology.com

Vaughan Company, Inc.

Montesano, WA

888-249-2467 • 360-249-4042 • Fax: 360-249-6155

info@chopperpumps.com

www.chopperpumps.com

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Xylem

Charlotte, NC

855-995-4261

www.xylem.com

Ad on page 5

Sludge - Screening

CleanTek Water Solutions

Fridley, MN 866-929-7773

info@cleantekwater.com

www.cleantekwater.com

HUBER Technology, Inc.

Denver, NC

704-949-1010 • Fax: 704-949-1020

marketing@hhusa.net

www.huberforum.net

Hydro International

Hillsboro, OR

866-615-8130 • 503-615-8130 • Fax: 503-615-2906

questions@hydro-int.com

www.hydro-int.com

Lakeside Equipment Corporation

Bartlett, IL

630-837-5640 • Fax: 630-837-5647

sales@lakeside-equipment.com www.lakeside-equipment.com

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SAVECO / Enviro-Care

Gurnee, IL

815-636-8306 • Fax: 847-672-7968

www.savecowaterna.com

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Sludge - Screens

E & I Corporation

a Div. of McNish Corporation

Westerville, OH

614-899-2282 • Fax: 614-899-0304

info@eandicorp.com

www.eandicorp.com

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GKD-USA. Inc.

Cambridge, MD

800-453-8616 • 410-221-8431

sales@gkdusa.com

www.gkd-group.com

Sludge Reduction/Treatment

Aqualitec Corp.

Los Angeles, CA

310-703-2174

info@aqualitec.com www.aqualitec.com

Byo-Gon, Inc.

Charleston, SC

888-296-4661 • 843-822-3415 • Fax: 843-606-6318

info@byogon.com

www.byogon.com Ad on page 101

Centrisys/CNP

Kenosha, WI

262-747-2384

info@centrisys-cnp.com www.centrisvs-cnp.com

Flottweg Separation Technology, Inc.

Independence, KY 859-448-2331

sales@flottwea.net

www.flottweg.com

GKD-USA, Inc.

Cambridge, MD

800-453-8616 • 410-221-8431

sales@gkdusa.com

www.qkd-group.com

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Press Technology & Mfg., Inc.

Springfield, OH 937-327-0755 dberner@presstechnology.com www.presstechnology.com

Software -**Operations/Maintenance**

AllMax Software, Inc.

Kenton, OH 800-670-1867 • 419-673-8863 sales@allmaxsoftware.com www.allmaxsoftware.com Ad on page 8

XiO, Inc.

San Rafael, CA 877-946-0101 info@xiowater.com www.xiowater.com

Software -**Process Control/Regulatory**

Hach

Loveland, CO 800-227-4224 • Fax: 970-669-2932 sales@hach.com www hach com

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Sacramento, CA 916-395-8800 sales@tescocontrols.com https://tescocontrols.com

XiO. Inc.

San Rafael, CA 877-946-0101 info@xiowater.com www xiowater com

Standard Solutions

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Hydro International

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Keller America Inc.

Newport News, VA 877-253-5537 • 757-596-6680 • Fax: 757-596-6659 sales@kelleramerica.com www.kelleramerica.com

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PMC-STS, Inc.

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Pulsar Measurement

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Rain for Rent

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AutomationDirect

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Electroswitch

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Pepperl+Fuchs, Inc.

Twinsburg, OH 330-425-3555 sales@us.pepperl-fuchs.com www.pepperl-fuchs.com

PRIMEX

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Systems Integration

Tesco Controls, Inc.

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Tanks - Chemical Storage

AmTech Tank Lining & Repair

Plymouth, NH 888-839-0373 • Fax: 603-947-9500 info@amtechtanklining.com www.amtechtanklinina.com Ad on page 89

Hawkins Water Treatment Group

Roseville, MN 800-328-5460 • 612-331-6910 • Fax: 612-331-5304 www.hawkinsinc.com

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Imperial Industries, Inc.

Wausau, WI

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Lutz-JESCO America Corp.

Rochester, NY 800-554-2762 • 585-426-0990 • Fax: 585-426-4025 mail@iescoamerica.com www.lutziescoamerica.com

USP Technologies

Atlanta, GA 877-346-4262 www.usptechnologies.com Ad on page 65

Tanks -Cleaning/Inspection/Repair



AmTech Tank Lining & Repair

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Environmental Coatings LLC

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JPCI Services

Mesa, AZ 480-986-1212 info@jpciservices.com www.jpciservices.com

Tanks - Coatings/Linings

AGRU America, Inc.

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Environmental Coatings LLC

Mesa, AZ 480-984-7608 info@sewershield.com www.sewershield.com

JPCI Services

Mesa. AZ 480-986-1212 info@ipciservices.com www.jpciservices.com



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Tanks - Mixers

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Vaughan Company, Inc.

Montesano, WA 888-249-2467 • 360-249-4042 • Fax: 360-249-6155 info@chopperpumps.com www.chopperpumps.com Ad on back cover

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AmTech Tank Lining & Repair

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Tanks - Slurry

Hvdro-Thermal Corporation Waukesha, WI

800-952-0121 • 262-548-8900 info@hydro-thermal.com www.hydro-thermal.com Ad on page 59

Tanks - Storage

Charter Machine Company

Metuchen, NJ 732-548-4400 walterk@chartermachine.com www.chartermachine.com Ad on page 67

IEP Technologies

Marlborough, MA 855-793-8407 • Fax: 508-485-3115 info@ieptechnologies.com www.ieptechnologies.com/engine Ad on page 79



Imperial Industries, Inc.

Wausau, WI 800-558-2945 • 715-359-0200 • Fax: 715-355-5349 info@imperialind.com www.imperialind.com Ad on page 97

Thermal Flow Meters

FLUID COMPONENTS INTERNATIONAL LLC

FCI - Fluid Components International

San Marcos, CA 800-854-1993 • 760-744-6950 • Fax: 760-736-6250 eflow@fluidcomponents.com www.fluidcomponents.com

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In-Situ Inc. (ChemScan, Partech)

Ft. Collins. CO 800-446-7488 info@in-situ.com www.in-situ.com Ad on page 81

LaMotte Company

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Lovibond

Sarasota, FL 800-922-5242 • 941-756-6410 • Fax: 941-727-9654 sales@lovibond.us www.lovibond.com Ad on page 55

Ultrasonic Flow Meters

Blue-White

Blue-White Industries

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Endress+Hauser

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people/awards

Bob Protivansky, operator at the Rutland Department of Public Works Sewage Plant, received the New England Water Environment Association's 2021 Operator of the Year award.

Hornady Manufacturing received the 2021 Scott Wilbur Award for Best in Class Industrial Wastewater Treatment Facility from the Nebraska Water Environment Federation.

Plainfield Township municipal water won the Michigan Section AWWA award for best-tasting water in the state.

The City of Bartlesville, Oklahoma, received its second exceptional project award from the U.S. EPA George F. Ames Performance and Innovation in the SRF Creating Environmental Success Program (PISCES) for a project to expand the potable water supply for the city and surrounding communities.

Thomas Lee, outgoing president of the Lowndes County (Mississippi) Industrial Development Authority, had the water treatment plant that serves the industrial park near Golden Triangle Regional Airport named in his honor.

Christy Everett was named CEO of the Grand Strand (South Carolina) Water & Sewer Authority, succeeding **Fred Richardson**, who retired after 37 including 28 years at the helm.

Walter Lynch, president and CEO of American Water, retired from the company. Susan Hardwick, who had been interim CEO, replaced him.

Craig Dotseth, director of public works in Prescott, Arizona, since 2017, retired after 35 years of public works experience and more than over 25 in various leadership positions with the city.

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events

May 2-4

Ontario AWWA Section Annual Conference, Scotiabank Convention Centre, Niagara Falls. Visit www.owwa.ca.

May 2-5

Alaska AWWA Section Annual Conference, Hotel Captain Cook, Anchorage. Visit www.awwma.org.

May 2-20

AWWA High-Tech Operator Course 3, online. Visit www.awwa.org.

AWWA Lead Service Line Replacement webinar. Visit www.awwa.org.

May 15-17

British Columbia AWWA Section Annual Conference, Victoria Conference Centre. Visit www.bcawwa.org.

May 18

AWWA Tracking Water Loss Control Progress Using the AWWA FWAS V6 and the new Water Audit Compiler webinar. Visit www.awwa.org.

May 22-25

West Virginia AWWA Section Annual Conference, Oglebay Resort & Conference Center, Wheeling. Visit www.wvawwa.com.

May 24-26

WEF Residuals and Biosolids Conference 2022, Greater Columbus (Ohio) Convention Center. Visit www.wef.org.

May 25-27

Connecticut AWWA Section Annual Conference, Hotel Viking, Newport, Rhode Island. Visit www.ctawwa.org.

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product news



OZ Lifting Products stainless series

OZ Lifting Products' stainless steel range includes chain hoists, trolleys and beam clamps, all designed for use in corrosive environments. The centerpiece of the line is the lightweight stainless steel chain hoist, which helps lift loads with minimal effort but is durable enough for the industry's most demanding applications. The hoists feature fully enclosed gearing; fully machined lift wheel; weatherproof holding brake; roller bearings on all gears and shafts; and forged stainless steel hooks and safety latches. Chain hoists, like the trolleys, are available in 1/2-, 1- and 2-ton capacities. The stainless push beam trolley fits most I-, S- and W-beams and has precision ball bearing trolley wheels. The beam clamps are available in 1 and 2 ton capacities. All products in the line are made from Type 304 stainless steel and come with individual test certificate and serial number.

800-749-1064; www.ozliftingproducts.com



Flomatic Valves Flo-Flex Model 345 foot valve

Flomatic Valves' latest model of AIS-compliant foot valve flapper style swing check valve is the Flo-Flex Model 345. Available in sizes 3- through 12-inch, the Model 345 is designed according to ANSI/AWWA C508 standards and is constructed in a corrosion-resistant, fusion-bonded, epoxy-coated ductile

product spotlight

Controller offers complete control of chemical metering

By Craig Mandli

Flow control in water treatment plants is an exact science. That's why accurate instrumentation is a requirement. The **Intuition-9 Series flow controller** from **Walchem, Iwaki America** offers versatility and powerful programming for complete control of chemical metering pumps and valves in a broad range of water treatment applications.

The universal sensor input provides extraordinary flexibility, allowing it to be used with almost any type of sensor needed. Its four I/O slots allow complete flexibility in adding sensors, analog outputs and Linear Polarization Resistance corrosion sensors. Three to 12 relay control outputs allow the controller to be used in more applications.

In a water treatment plant, the controller can monitor and tabulate flows throughout the plant and can be tied to appropriate metering pumps for chemical feed throughout the plant including, but not limited to chemistries for treating the incoming water such as flocculants, permanganate, lime, caustic soda and alum prior to flash-mix and flocculation tanks. It can also be used to monitor turbidity of treated water off of the filters and has the ability to perform filter backwash. Users can monitor and feed chemicals to control the free chlorine, pH and fluoride prior to entering the clear well and finished water storage, along with other chemical feed control, such as corrosion inhibitors prior to entry into the distribution system.



Intuition-9 Series from Walchem, Iwaki America

"Intuition-9 is a cost-effective, powerful controller that is a perfect fit for the municipal rural water and wastewater markets," says Robert Rumelfanger, northeast regional sales manager for Iwaki America. "Its capabilities also make it an easy fit into larger plants where it can be tied into an existing SCADA system via Modbus TCP."

According to Rumerfanger, customer feedback on the controller has been encouraging, with many citing ease of use, such as the ability to quickly change control set points and control strategies with little effort. Easy remote access is also highly touted by customers.

"They find that they can check in on the systems that they are monitoring from afar and easily visualize current and past conditions to optimize their system operations," he says. "They like the ability to quickly visualize key data on their system's operation, connect to the device with a single click and customize alarm outputs, including alarm repeat and escalation with acknowledgement."

508-429-1110; www.walchem.com

iron body featuring a 316 stainless steel strainer and class ANSI 150 flange connections. Its screen open flow area is over three times the open area of the nominal area pipe size while the one-piece molded disc allows 100% full flow in the open position. The valve features a number of functions, including a fastpaced 45-degree valve-seat angle for short disc travel, nonslam high performance resulting in the reduction of water hammer, optional drilled/ tapped/plugged raised boss for easy installation of gauges or accessories and a low headloss design. It is specifically designed to seal securely and tightly to minimize pump suction losses.

800-833-2040; www.flomatic.com



Endress+Hauser Proline Prosonic Flow W 400 flowmeter

The Prosonic Flow W 400 flowmeter brings the modern technology of Endress+Hauser's Proline device series to clamp-on ultrasonic flowmeters. The W 400 clamp-on and I 400 insertion units provide comprehensive process monitoring with long-term cost efficiency and extensive diagnostics. These sensors pair with Endress+Hauser's Proline 400 transmitter to provide a complete flow metering solution. The flowmeter uses a nonintrusive, clamp-on measurement method, with its ultrasonic sensors mounted directly on a pipe's exterior. This provides safe measurement of many fluids, independent of their conductivity or other properties. The flowmeter's IP68 Type 6P submergence-rated ultrasonic sensors provide long-term and reliable operation, requiring little maintenance. This makes them suitable for use in harsh process and ambient conditions, able to withstand temperatures from negative 40 to 266 degrees F.

888-363-7377; www.us.endress.com

product spotlight wastewater

Hydrogen sulfide data logger catches issues early

By Craig Mandli

Hydrogen sulfide is toxic, combustible and can be very corrosive. Even at concentrations below the toxic level of 300 ppm, it can cause irritation of the eyes nose and throat, headache, nausea, dizziness and loss of coordination. In addition, its rotten egg smell can often lead to complaints from residents near treatment plants. Its corrosive properties also can lead to the premature degradation of pipes, manholes, lift stations and pumping equipment.

Fortunately there are devices that can catch rising hydrogen sulfide levels before they cause such problems. CAS Dataloggers' OdaLog G20 hydrogen sulfide data logger features a digital H₂S smart sensor. It is IP68 rated for use in harsh wastewater applications and ATEX/ IECEx certified for hazardous environments. Features that make it an upgrade over previous versions include a gas sensor that allows for up to 90-day deployment, SD memory card that stores up to 10 million data points, built-in sensor health indicator, Modbus communication for connection to SCADA systems, and an integrated 4G cellular modem for remote monitoring. According to Nick Taylor, product manager for Environmental Analysis and Characterization Equipment at Thermo Fisher Scientific, the unit is a fit for numerous treatment plant applications, including sewerage pumping stations; gas monitoring in manholes, drains and pits; odor monitoring in sewer network and streaming water; ventilation pipes and rising mains; inside sewer collection lines; asset management for corrosion and odor control; and wastewater plant fence line monitoring for odor.

"It has a state-of-the-art digital smart gas sensor, enabling predictive maintenance," says Taylor. "Bluetooth, USB and Modbus are integral, making data easy to access, manually or via an integrated system."



For remote logging applications, the OdaLog G20-RTX model provides 4G cellular access. Both models are rated to IP68 and are ATEX/ IECEx certified, making them ideal for use in harsh wastewater applications and in hazardous environments.

"Feedback from users of the previous generations of OdaLog revealed that customers were looking to reduce the cost of gas logging whilst at the same time achieving reliable and consistent operation," says Taylor. "OdaLog G20 provides this by means of a long in-field deployment, without the need for expensive dilution or purging technologies. This, along with predictive maintenance afforded via the digital smart gas sensor, reduces the total cost of ownership.

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QED Environmental Systems' new AutoPump AP4 Ultra Xtreme pump is designed for the most extreme landfill and remediation pumping applications. The exclusive self-cleaning vortex action and proprietary surface finish on internal components improves performance, allowing pumps to operate up to 10 times longer than the AP4 Ultra

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PRESENTERS:



Global Product Manager

Evoqua Water Technologies
Allen has been with Evoqua for over 25 years with the last 10 managing
Chain & Scraper and Circular Clarifier product lines. Allen has held
numerous roles within Evoqua including Application Engineering,
Aftermarket Management and Product Management for their RBC,
Digestion, Filtration and Screw Pump product lines.



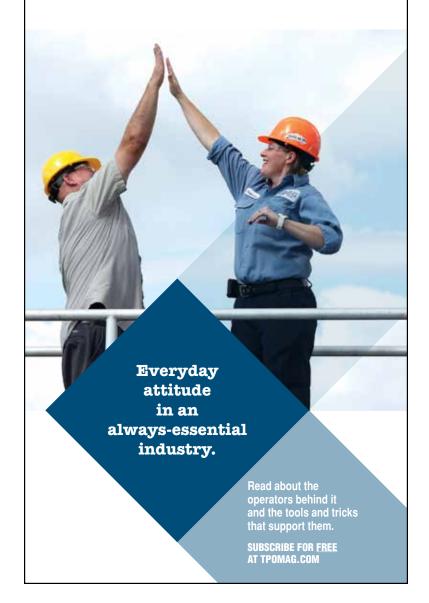
Jeff Germait **Product Engineer**

Product Engineer
Evoqua Water Technologies
Jeff has been with Evoqua for over 15 years, working exclusively with
the Circular Clarifier product line. Jeff has held numerous roles within
Evoqua including Mechanical Designer and Retrofit Specialist with a
recent focus on Standardization, Design for Manufacturers & Assembly
(DFMA) and Value Analysis/Value Engineering (VA/VE) initiatives.



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Christen Wood **Operations Administrator** Upper Tuscarawas Wastewater Treatment Plant, Akron, Ohio





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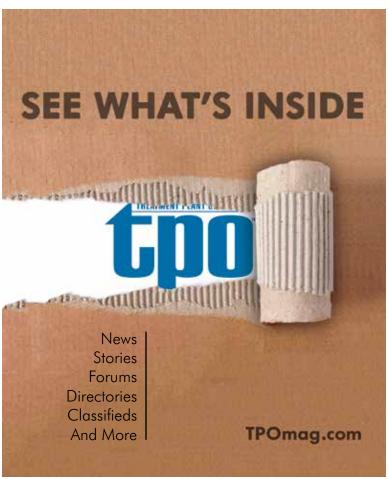
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Water Drop Alert!

TEXT MESSAGES FOR MILWAUKEE'S CLEAN-WATER UTILITY NOTIFY RESIDENTS
DURING HEAVY RAINS TO CUT BACK ON WATER USE AND HELP PREVENT SEWER OVERFLOWS

By Sandra Buettner

he Milwaukee Metropolitan Sewerage District has enlisted residents' help in reducing sewer overflows during heavy rains by creating a Water Drop Alert text message campaign.

Since 1994 the district has averaged 2.3 overflows per year, and the goal is to get that to zero by changing citizens' behaviors. Residents who opt into the Water Drop campaign are alerted to weather conditions during which they could make overflows worse if they use water.

The alerts come via cellphones and ask recipients to delay dish washing and laundry and take shorter showers during wet-weather periods. The program began in 2017 and has grown more popular ever since.

The district has capacity to treat 600 mgd for 28 municipalities and serves 1.1 million people through its Jones Island and South Shore water reclamation facilities on the shore of Lake Michigan. To help reduce overflows the district promotes rain garden plant sales, rain barrel workshops, a private property inflow and infiltration program, and more.

THE ORIGINS

To make the Water Drop program happen, the district enlisted Common Ground, a nonpartisan group in southeastern Wisconsin made up of a group of citizens who identify problems in a community and work on creative solutions.

The organization helped design the cost-effective and innovative text alert system and then worked with the district to push simple, informative and actionable messages out to those who register to receive them. The cost to send each text message is one cent.

Once the idea was hatched, the district promoted it through social media, its website, billboards around its service area, in-person events and neighborhood apps. In four years, the program has grown from a few hundred participants to 4,200.

OPTING IN

Signing up is easy: Residents simply send a text to a specified number from their cellphones, or visit the district website and submit a form. The website provides weather, rainfall and overflow information. Subscribers can opt out at any time.

"Our goal is to provide timely information to the public in hopes of preparing them for dangerous conditions they should know about, and at the same time ask them to change their behaviors to help decrease the impacts of storm events on our sewer system," says Jeff Spence, director of community outreach and business engagement. Messages residents receive include:

- Thanks for opting in
- Requests to limit water use until the rain ends
- Notification on whether an overflow has occurred
- Notices when an alert is over with thanks for reducing water usage



While it's difficult to quantify the exact impact, we have seen an increased awareness among residents in how their use of water during a rain event can affect the community."

AWARD RECOGNITION

The Water Drop Alert campaign received a National Association of Clean Water Agencies 2021 National Environmental Achievement Award for Public Information and Education in the electronic media category.

As a bonus, the program educates the public on the services the district provides, especially for who visit to the website. Information on the website tells about overflows and how weather affects them. Residents can also learn other ways to save water at homes and in the community.

"While it's difficult to quantify the exact impact, we have seen an increased awareness among residents in how their use of water during a rain event can affect the community," Spence says.

"An interesting observation is that many of our residents have little understanding of how our water systems work and how our individual actions can help or hinder operations that protect community health, property and local waterways. This signals that we need to do an even better job of public education and engagement."

The Water Drop Alert program is helping to do just that. Spence notes that when the utility sends a Water Drop Alert, it is its most shared social post. This indicates that residents believe in the alerts and want to help educate their friends and families. **tpo**

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Shearing and degradation can wreak havoc on your product quality. Air locking and pump wear lead to unplanned shutdowns and high maintenance costs – and eventually the need for new equipment. The KREBS® hMAX pump addresses all of these challenges and more, making it ideal for a wide variety of water treatment processes.

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WE DISCOVER POTENTIAL







Simplify your set-up and reduce your maintenance costs with the ONLY Self-Priming Chopper Pump in the World. These pumps are designed to handle the toughest solids, while providing a cost-effective maintenance alternative to wet-pit pumps.

Choose the unmatched reliability of Vaughan. Ask about our free trial program and on-site demos.





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