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HOW WE DO IT:
A laboratory
face-lift | 38

TECH TALK:
Making blower
retrofits pay | 22

Doing the Impossible

A TENNESSEE FACILITY TEAM REWRITES
THE PLAYBOOK ON NUTRIENT REMOVAL | 24

John Strickland
Plant Manager
Murfreesboro, Tenn.

IN MY WORDS:
The power of
young professionals | 36



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advertiser index

January 2021

 AERZEN Aerzen 15	Carollo Engineers, Inc. 11  ClearSpan Structures 19	 JDV JDV Equipment Corporation 8	 LAKESIDE Lakeside Equipment Corporation 3
Analytical Technology, Inc. 48  AQUA-AEROBIC SYSTEMS, INC.	Emerald Coast Manufacturing ... 21 Flomatic Valves 4	 KELLER Keller America Inc. 5  Komline-Sanderson	 Vaughan Vaughan Company, Inc. 2
Aqua-Aerobic Systems, Inc. 7 Bright Technologies, Division of Sebright Products, Inc. 31	Fournier Industries, Inc. 23 Hurst Boiler 17	Komline-Sanderson 47  KUHN Kuhn North America, Inc. 9	YSI, a Xylem brand 9

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contents January 2021

- 8 **LET'S BE CLEAR: IN PRAISE OF WATER HEROES**
Clean-water organizations recognize professionals who went above and beyond to protect communities, facilities and people.
By Ted J. Rulseh, Editor
- 10 **@TPOMAG.COM**
Visit daily for exclusive news, features and blogs.
- 18 **TECHNOLOGY DEEP DIVE: HANDS-OFF SAMPLE COLLECTION**
A vacuum-based wastewater sampler offers long-lasting accuracy, ease of programming and durability in harsh climate conditions.
By Ted J. Rulseh
- 20 **SUSTAINABLE OPERATIONS: TOUCHING ALL THE BASES**
St. Cloud sustainability projects save energy, save money, improve performance, reduce maintenance, and justify a new treatment facility name.
By Steve Lund
- 22 **TECH TALK: HELPING BLOWER UPGRADES PAY**
A new testing method helps operators accurately document energy savings and secure and maximize incentives from electric utilities.
By Thomas E. Jenkins, P.E.
- 29 **HEARTS AND MINDS: POETIC LICENSE**
A contest for water reuse operators in the Pacific Northwest puts a new spin on friendly competition at an annual conference.
By Sandra Buettner
- 30 **PLANTSCAPES: WINGS OF WONDER**
A milkweed patch sprouted at the Greater Sudbury Wastewater Treatment Plant. The team and community groups turned it into a haven for monarch butterflies.
By Jeff Smith
- 36 **IN MY WORDS: GLAD TO LEND A HAND**
Kristi Steiner, WEF's 2020 Outstanding Young Water Environment Professional, has prospered from industry involvement and encourages others to do likewise.
By Ted J. Rulseh
- 38 **HOW WE DO IT: LAB RENEWAL**
A Florida testing laboratory uses polypropylene fume hoods and casework to deliver long life against test protocols that use corrosive chemicals.
By Kevin R. Murphy
- 39 **INDUSTRY NEWS**

top performers



- 12 **WASTEWATER OPERATOR: SUCCESS AT EVERY STEP**
Paul Burris made many career stops before landing in Elmhurst, Illinois. That city now benefits from his diverse experience in operations and leadership.
By Ted J. Rulseh

- 24 **WASTEWATER PLANT: DOING THE IMPOSSIBLE**
A Tennessee facility team rewrites the playbook on nutrient removal to clear the way for a plant expansion essential to economic growth in its community.
By Suzan Chin-Taylor
- ON THE COVER: When facing difficult odds to meet aggressive new effluent nutrient limits, the Murfreesboro Water Resources Department team members banded together. They drew upon internal resources, skills and innovation to complete a treatment plant expansion that was financially viable, met the permit requirement, and provided a framework for capacity expansion and long-term reliability. (Photography by Martin Cherry)

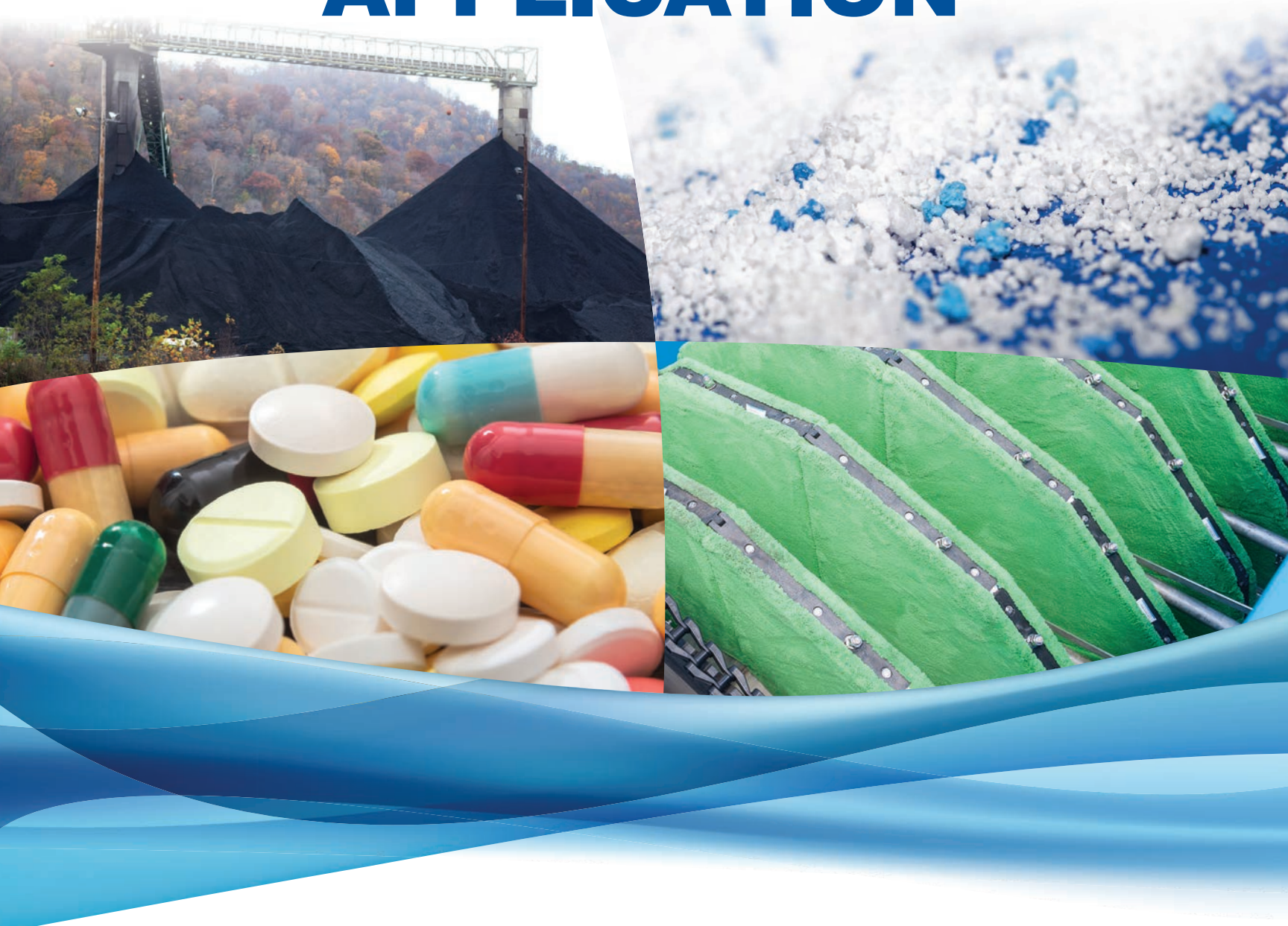
- 32 **WATER PLANT: SWEATING THE SMALL STUFF**
Efficient operations and an emphasis on recycling add up to award-winning performance for this Florida water treatment team.
By David Steinkraus

- 40 **PRODUCT NEWS**
Product Spotlights:
Wastewater: Visual assistance platform enables remote customer support
Water: Analyzer suite keeps eye on important parameters
By Craig Mandli
- 41 **EXAM STUDY GUIDE**
- 42 **CASE STUDIES: REUSE, RECOVERY AND ENERGY MANAGEMENT**
By Craig Mandli
- 44 **PRODUCT FOCUS: REUSE, RECOVERY AND ENERGY MANAGEMENT**
By Craig Mandli
- 47 **WORTH NOTING**
People/Awards

coming next month: February 2021 FOCUS: **Biosolids Management/Headworks**

» Let's Be Clear: Water infrastructure: Not improving with age » TOP PERFORMERS: Water Operator: Perry Smith, Garden City, Kansas | Water Operator: Jeff Pearson, County of Maui, Hawaii | Wastewater Plant: Ashland (Kentucky) WWTP » In My Words: Wastewater challenges in smaller communities » Tech Talk: Online digital measurement technology » Sustainable Operations: Sustainable plant design in Fairfax County, Virginia » Hearts and Minds: Floating wetland project in Broken Arrow, Oklahoma » Technology Deep Dive: Identifying filamentous bacteria with AI

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let's be clear

In Praise of Water Heroes

CLEAN-WATER ORGANIZATIONS RECOGNIZE PROFESSIONALS WHO WENT ABOVE AND BEYOND TO PROTECT COMMUNITIES, FACILITIES AND PEOPLE

By Ted J. Rulseh, Editor



One can easily argue that water professionals do heroic deeds every day, whether supplying safe drinking water or protecting water resources from pollution and people from disease.

The reality is they are often heroic in other ways, as well. The Water Environment Federation and the Water Environment Association of Texas recently recognized a number of people for exceptional service in tough situations.

Perhaps the most dramatic deed was recognized by the WEAT with a 2020 Medal of Honor for Heroism Award. Ralph Hect and the team at Houston Water's Cullen Maintenance Facility pulled off a daring rescue during Hurricane Harvey.

RISING WATERS

On the evening of Aug. 25, 2017, the streets near the facility were flooded and the water was rising. Hect, a maintenance supervisor, made it to the facility in his heavy-duty pickup truck. Later he and colleagues discovered a man in a wheelchair who had become trapped in the floodwaters, rising in a torrential rain.

They called 911, but believing that the Houston Fire Department might not arrive in time, Hect waded into the water. The man's electric wheelchair did not work and wouldn't go into a manual mode; the water was at the level of the man's chest and rising.

Acting quickly, the Houston Water team drove a semi with a low-boy trailer into the water and powered it as far as it could go. Then they lifted the man in his wheelchair onto the trailer and transported him to the maintenance shop, where they cared for him and helped him contact his family. Their selfless actions clearly saved a life.

WEF HEROES

Meanwhile, last September, WEF issued three Water Heroes Awards, reserved for those who perform beyond the usual call of duty during emergencies. The recipients were:

First Utility District, Knoxville, Tennessee. In February 2019, unprecedented rainfall put wastewater pump stations underwater; the depth reached about 20 feet aboveground level in some places. Every department in the district pitched in heavily, as the flood threatened customers and the system's integrity. "Between Feb. 23 and May 17, crews worked more than 1,300 regular hours and more than 1,400 overtime hours to manage the situation," according to a WEF news release.

Papillion Creek and Missouri River Water Resource Recovery Facilities, Omaha, Nebraska. In spring 2019, the state saw huge flooding from



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Let's Solve Water

The man's electric wheelchair did not work and wouldn't go into a manual mode; the water was at the level of the man's chest and rising.

rapid snow melt, frozen ground and a bomb cyclone rainstorm. David Sykora, Michael Arends, Jim Theiler and staff took decisive action. On receiving the flood forecasts, they organized an around-the-clock, all-hands effort to lay barriers and sandbags, often wading through waist-deep water, to keep the Missouri River facility in operation.

At Papillion Creek, the process was similar, but flooding came from the confluence of the Missouri and Platte rivers. The staff worked to protect the facility until water started to come over the levees around the facility. After the flood, the staff "worked tirelessly to beat the time estimates to bring the facility back online and replace pumps, electrical lines, and other equipment."

Waterborne Infectious Disease Outbreak Control subcommittee. This group of WEF members worked overtime to allow the federation to give water utilities and water professionals relevant, actionable information to protect essential workers and inform communities during the coronavirus pandemic.

The group created webcasts, podcasts and fact sheets and worked with WEF staff to validate website and publication content. Members were Akin Babatola, Robert Bastian, Kyle Bibby, Kari Brisolar, Elizabeth Conway, Lee Gary, Dr. Rasha Maal-Bared (chair), Lisa McFadden, Naoko Munakata, Lola Olabode, Robert Reimers, Albert Rubin, Samendra Sherchan, Scott Schaefer, Jay Swift, Charles Gerba, Mark Sobsey and Dr. Charles Haas.

It just goes to show that for many in the water professions, going above and beyond is all in a day's work. **tpo**

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TANK OF THE YEAR

City of Destin Wins Honors

A municipal water tank in Destin, Florida, is this year's winner of the Tank of the Year competition sponsored by Tnemec Company, Inc. The water tank was selected by a panel of water tank enthusiasts based on criteria such as artistic value, significance of the tank to the community, and challenges encountered during the project.

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EDUCATION HUB

Utility Reaches Thousands of Students

COVID-19 hasn't stopped the flow of wastewater into treatment plants, and it shouldn't stop the stream of water education either. The Prince William County (Virginia) Service Authority now offers a new opportunity for kids to learn about the water/wastewater world via virtual models, activities and interactive presentations on its online learning hub H2Go Kids.

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OVERHEARD ONLINE

"One of the barriers to widespread water reuse is the perception that Canada has an endless supply of freshwater."

Calgary Brewery Makes Great Tasting Beer From Recycled Wastewater
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NUTRIENT RECOVERY

Researchers Develop Membrane



Researchers at Aalto University in Finland have announced a process they developed called NPHarvest, which allows for the recovery of nitrogen and phosphorus from wastewater in a way that produces a clean ammonium sulfate solution for fertilizer, along with a slurry rich in phosphorus and calcium.

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PAUL BURRIS MADE MANY CAREER STOPS BEFORE LANDING IN ELMHURST, ILLINOIS. THAT CITY NOW BENEFITS FROM HIS DIVERSE EXPERIENCE IN OPERATIONS AND LEADERSHIP.

STORY: **Ted J. Rulseh** PHOTOGRAPHY: **Kimberly Felten**



Paul Burris, utility operations manager in Elmhurst, Illinois.

A city leader looking at a resume from Paul Burris might easily have said: No, too many jobs in too short a time.

Leaders in the Illinois City of Elmhurst saw something else: Solid and diverse experience and a record of accomplishment. They hired Burris in April 2016 as utility operations manager, and they certainly have not been sorry.

Burris has led a comprehensive upgrade of the city's wastewater treatment plant, an aggressive attack on I&I in the collection system, the installation of automated metering infrastructure and leak detection on the drinking water side, and more. The city's confidence in Burris was confirmed when he was named 2018 Professional Manager of the Year in water resources by the American Public Works Association.

Burris credits his success to a broad background on the municipal and private sector sides of the water and wastewater industry, to mentors who guided him on the way, and to co-workers in the communities and companies he has served.

"It's not about me," Burris says. "Others surrounding me have made me better, helping me see things I'd never seen before, showing me how to look at things differently."

STARTING EARLY

In Elmhurst (population 45,000), a western suburb of Chicago, Burris is responsible for wastewater, drinking water and stormwater. The various job changes he had made didn't bother Howard Kilian, then public works director (now retired). "I looked at his overall experience and the things he had done," says Kilian. "We were looking for someone who could come in, take control of the operation and run with it."

"Paul has really turned around both the wastewater operations and the utility division. He has brought a lot of professionalism into the group, really pushing for everybody to get to a certain level of licensing for the positions they're in."

"He has a go-getter, complete-a-project attitude. I gave him a water meter replacement project that we had been looking at for years. He took control and before we knew it, that project was done and operational. He is cutting-edge when it comes to technology."

It could be said that Burris started his water career at a bowling alley in New Lenox, Illinois, a village of 26,000 half an hour southwest of Chicago.



A wastewater treatment plant upgrade included a new electrical system. Burris is shown inspecting the motor control center units before the facility was energized.

“It’s not about me. Others surrounding me have made me better, helping me see things I’d never seen before, showing me how to look at things differently.”

PAUL BURRIS

Paul Burris, City of Elmhurst, Illinois

POSITION:
Utility operations manager

EXPERIENCE:
30 years in the industry

EDUCATION:
Bachelor of arts, business management, and masters in public administration, both from Governors State University, University Park, Illinois

CERTIFICATIONS:
Multiple water and wastewater certifications in Illinois, Michigan, Indiana, New Jersey and Arizona

GOAL:
Become a director of public works, make facilities the best they can be

“I was 16 years old, and I was on a bowling team with the mayor’s son,” he recalls. “We talked about summer jobs.” He landed a summer position with the street department, doing maintenance and mowing grass.

That was in 1981. In later high school years he worked in the water department and for a time at the wastewater treatment plant. After high school, indulging an interest in math and computing, he joined a securities firm. A few years later, preferring to work outdoors, he went back to New Lenox as a laborer in the wastewater plant.

A MENTOR FOR LIFE

In 1987 Burris was derailed by a car accident that left him with a severe concussion, a shattered right hand, and back, shoulder and knee injuries. While his body healed, his boss Mike Turley, wastewater treatment plant superintendent, helped rebuild his confidence.

“Mike pretty much changed my life,” Burris recalls. “For a time I thought I wasn’t going to amount to much. As I worked to put myself back together, he was always there. He basically made it a challenge for me. We became real good friends. He was my mentor. He let me learn from my mistakes, which was probably the biggest thing.”

“When I was struggling with a certain task or a certain problem, he would never give me the answer. He would make me figure it out. It was always about learning, getting better, learning how to get others better. One thing he taught me was that this is not a job, it’s really a career.”

“We used to challenge each other. He went for his bachelor’s degree, I went for mine. I went for my water license, he went for his. He was teaching at Joliet Junior College; I started teaching for the Environmental Resource Training Center at Southern Illinois University in Edwardsville. We pushed each other to go to the next step.”

While in New Lenox Burris and Turley, along with co-worker Brian Williams, formed an operations company that helped small communities and private entities like mobile home parks operate their water and wastewater systems.

ONWARD, UPWARD

In 2001, Burris was recruited by the Aqua America utility services company, where he was in charge of a surface water treatment plant in Kankakee, Illinois. There he learned that skills useful in a municipal setting do not necessarily translate directly to the private sector. That was the first in a series of job changes over the next decade and a half. In 2005 he joined American Water as contract operations manager for the West Region.

“That was the first time I got to experience dealing with elected officials, higher-level regulators and decision-makers,” he recalls. “It was exciting to



Paul Burris takes pride in being a teacher as well as a leader and operator.

do that. They had one of the best employee training programs I've ever seen. If you needed classes, special training, whatever it was, they provided it. I had two supervisors there, Rob Kuta and Troy Day. When I had questions, they were there."

A year later he moved on to Utilities Inc., overseeing facility operations in Illinois, Indiana, Arizona and Nevada. After four years he was responsible for facilities in four other states and traveled about 300 days per year. When his mother fell ill, he returned to Illinois as chief operator of the largest wastewater treatment plant in DuPage County. He's indebted to



Burris (right) and Tom Tapella, utility assistant superintendent, view the three new raw influent screw pumps (Evoqua Water Technologies). Each screw pump has 10 mgd capacity.

DEALING WITH COVID-19

Utilities face enough challenges without having to deal with a pandemic. "COVID-19 has thrown curveballs like we've never seen before," says Paul Burris, utility operations manager for the City of Elmhurst.

"My department normally works out of the Public Works building; we don't anymore," Burris said last June. "We work out of a fire station training tower and the York Township civic center. We broke our teams up into separate places to work, with separate trucks to drive and separate equipment to use. It's to eliminate the cross-contamination from one team member getting sick and passing it on to everybody else.

"I'm really happy to see how seriously our council and city manager are taking this. It concerns me a lot. What happens if we lose our Utilities Division? You can't go find an operator the next day to run an 8 mgd wastewater treatment they've never been in.

"We can hire contractors to fix water mains and things like that, but we've already had contractors come down with COVID-19 on their

crews, and they're not available. So it's a challenging time, where good backup plans aren't always good backup plans anymore."

In one major change, the wastewater treatment plant team members who all used to work on the same daytime shift are now divided into three shifts, again to create more separation: "It has really played havoc on their lives. We have to do everything we can to support them, to make it as easy as possible for them, yet still retain that separation."

The loss of funds is another concern. Stay-at-home orders and business closures mean tax and user fee revenues are down. "We saw the water usage at some businesses near zero because they weren't open," Burris says. "We see more usage at home, but not nearly what we saw from businesses. So water revenues are down, and wastewater revenues are down.

"How do you manage in these times? Maybe you don't do the I&I program or the water main replacements. On the street side, maybe you don't do the paving program. How do we make things function in the future? Right now I don't think anybody knows."

Roy Kressman and Joel Simintel, principal operators, for helping him deal with his personal issues while maintaining work performance.

Three-and-a-half years later his mom had recovered, “So it was time for me to spread my wings again.” The next stop was as area manager with United Water in Michigan, in charge of nine facilities.

“My supervisor, Gary Timmer, put together an unbelievable team. We got things done. We started programs to train our employees to better understand the processes and our clients. Gary’s support and leadership shaped my management skills in areas where I was lacking.”

When his stepdad fell ill in 2014, Burris moved back to Illinois again, this time as director for water and wastewater in Crest Hill. There he applied his experience to create his first utility master plan for the water system. Among many accomplishments, he and team member (and eventual successor) Mark Siefert developed a process to flush some 1,000 hydrants in four weeks — a process the city crew had struggled with before.

“Paul has brought a lot of professionalism into the group. ... He has a go-getter, complete-a-project attitude.”

HOWARD KILIAN

ON TO ELMHURST

There was a reason for each step in the journey, and the same was true for the move to Elmhurst in 2016. “We purchase our water from DuPage Water Commission,” Burris says. “We use about 4 mgd. We have 15 million gallons of storage and about 183 miles of water mains to maintain. On the wastewater side we have an activated sludge wastewater treatment plant that can treat up to about 20 mgd. Then we have an excess flow facility where we can make modifications in the plant to treat another 40 mgd.” The average flow is 8 mgd.

Key members of the Elmhurst team include Cori Tiberi, assistant public works director; Kent Johnson, city engineer; Dan Rosenwinkel, utility superintendent for water production and treatment; and Chris Dufort, utility superintendent for water distribution and collection.

Elmhurst’s combined wastewater collection system was separated in the 1980s, but some drain tiles, sump pumps and other sources remain connected. “So we still get high flows when it rains,” Burris says. “We’re now on a program of televising, relining and manhole repairs. We’re investing money every year to keep the flows as low as we can.”

Another challenge was unaccounted-for water. The city’s water meters were more than 25 years old, and most needed to be changed out. In 10 months the city replaced 15,000 meters, choosing Neptune Technology Group units for residential customers and Master Meter units for the commercial side. The city also deployed an automated metering infrastructure (Aclara).

A customer portal with WaterSmart software enables homeowners to monitor their water use online and receive notification of leaks.

While a team worked on a water meter exchange and AMI plan, they discovered ZoneScan acoustical

water-leak detection technology (Gutermann, an Aclara-affiliated manufacturer). “The city used to hire a contractor on an annual or biennial basis to listen to all 183 miles of pipe,” says Burris. “If a break happened the next day, we might not find it for one or two years, or until it surfaced.”

ZoneScan was an overseas technology that no utility in the United States had implemented at similar scale or on an AMI. The city installed 609 units on the distribution system. “Now every night at 2 a.m. it listens for water main breaks,” Burris says. As the sounds get louder, it sends the data back into a program that we look at every morning, and it codes them on their severity from zero to 100.”

The meter exchange and the ZoneScan technology helped the city reduce unaccounted-for water from 18% to 20% to approaching 5%. Payback on the system was one year. The project helped the city earn a 2020 Utility Saver Award from the Illinois Section AWWA, a 2019 Innovation of the Year from

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Paul Burris and the Elmhurst Public Works Utility Division team up to deliver high-quality water and wastewater services to their community.

the DuPage Mayors and Managers Conference, and an Innovation Award from the APWA Chicago chapter.

THE WASTEWATER SIDE

Meanwhile, the city's wastewater treatment plant, built in the 1930s and rebuilt in the 1980s and 1990s, is getting another major upgrade, in part to prepare for an expected effluent phosphorus limit of 0.5 to 1.0 mg/L by 2028. The new process is likely to include both chemical and biological phosphorus removal.

For the time being the team has replaced older centrifugal blowers with high-speed turbo blowers (APG-Neuros). Other projects include rebuilding three large screw pumps (Evoqua Water Technologies), rebuilding the grit system (AMWELL collectors, Pentair pumps, Raptor grit washers from Lakeside Equipment) and bar screens (Headworks International). The work also includes renovating the HVAC system, replacing the old belt presses with two new Komline-Sanderson units and redoing all the underground electric, gas, fiber, potable water and nonpotable water systems.

A big event during his Elmhurst tenure was working with Tyler Reifert, president of WaterTalent, an operations company that provides temporary or emergency operators when needed. Burris was asked to be a co-leader of a 2017 project setting up temporary wastewater treatment plants in Houston after Hurricane Harvey.

BEING A TEACHER

Burris describes his management style as "hands-off with teaching as needed. I sometimes get staff upset when I do not directly answer a question. I ask them for their recommendation; that requires them to think about the problem and then offer solutions.

"As a teacher I always say there are no dumb questions. If you don't know, then likely someone else doesn't know. So ask anything you are unclear on. Many of my students learn how water systems work, not how to pass a test. Teaching someone to memorize a question and answer is not a way to teach future water and wastewater operators."

Looking back, Burris recalls a concept he learned from mentor Mike Turley: "He taught me that this is a hobby. Work became a hobby because I liked doing it. Mike instilled that in me, and I've tried to instill that in others." **tpo**

“Many of my students learn how water systems work, not how to pass a test. Teaching someone to memorize a question and answer is not a way to teach future water and wastewater operators.”

PAUL BURRIS

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-Jeff Pippenger, Utilities Administrator.
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1. The WAVE sampler is a heavy-duty, electronically controlled vacuum-based unit that draws wastewater samples for lab analysis.
2. Operators can program the unit to pull samples based on flow pacing, or time, or a combination.

Hands-Off Sample Collection

A VACUUM-BASED WASTEWATER SAMPLER OFFERS LONG-LASTING ACCURACY, EASE OF PROGRAMMING AND DURABILITY IN HARSH CLIMATE CONDITIONS

By Ted J. Rulseh

Lab testing in clean-water plants is critical to permit compliance and the process controls that enable it.

An essential part of testing is taking samples in correct amounts and at the right intervals and handling them properly to ensure accurate and reliable test results. Manual sampling can be a time-consuming job and one that can introduce variability in results.

Now Emerald Coast Mfg. has introduced an automated sample collection technology that allows for composite sampling with high accuracy. The WAVE sampler is a heavy-duty, electronically controlled vacuum-based unit.

It enables users to specify the volumes of wastewater to be collected and to program times or flow intervals for sample collection. It is an all-climate unit designed to suit indoor as well as harsh outdoor environments. Ronnie Jones, company president, talked about the device in an interview with *Treatment Plant Operator*.

tpo: What advantage does this technology have over other sampling solutions?

Jones: This is a vacuum-style sampler, which means that customers don't have the maintenance that is required on peristaltic-style samplers. We use a vacuum pump to bring the sample into a chamber where it is measured. The sample accuracy and velocity are sustained over time.

tpo: Where in the process are samples taken with this device?

Jones: It is typically placed in the headworks area, and many times also at the outfall. They bring in composite samples for measuring parameters such as BOD, COD and TSS. If they sample at the front end and the back end, then if they know what their BODs and TSS were coming in, they know how much they are removing.

tpo: How are the samples regulated?

Jones: The operators can set this unit up to pull samples based on flow pacing, or time, or a combination of flow and time. For example, if they want to sample every 50,000 gallons, but they don't want to sample at an interval less than 30 minutes, they can program for that. So in slow-flow periods like the wee hours of the morning, they can sample every 30 minutes, but at midmorning when the flow is high, they can sample at every 50,000 gallons.

tpo: How do operators program the sampler?

Jones: It has a color touch-screen user interface that makes programming very simple. They can program for the sample size, the amount of purge time, to the amount of vacuum time needed to draw the sample into the unit, and how many times to rinse the line before it actually pulls the samples. All that can be programmed with the user interface.

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tpo: How easy is the system for the operators to learn?

Jones: I would say that if operators can use a smartphone, they can program this unit. It's very user-friendly. For example, if they want to change the sample size, they go into the sample tab, choose sample size, and enter whatever size they want, from 20 mL to 500 mL. The unit has a removable refrigeration module so that if there is a problem with it, they can pull it out and send it in for a factory repair. And they could have a spare sitting on the shelf to slide in for an immediate replacement.

tpo: How would you characterize the accuracy of the sampler?

Jones: It has 1% repeatability and 3% accuracy on sample size. So a 250 mL sample will be within 1% of that volume every time, whether it be the first 10 samples or 250 or more samples down the road.

tpo: Is this unit permanently mounted?

Jones: Yes. Installation involved taking it to the level area where they're going to mount it, having 120-volt AC power available, having any remote signal available, such as from a flowmeter, and connecting suction tubing with a strainer on it to the stream of water they will be sampling. The unit can perform vertical lifts of nearly 30 feet, such as to pull samples up from a wet well. It can also pull long lengths and still maintain the U.S. EPA's required velocity.

tpo: Is the unit temperature-controlled?

Jones: The unit is designed to operate in all climates, from 125 degrees F and high humidity to 32 degrees or colder. It maintains 4 degrees C inside the cabinet, which is the U.S. EPA requirement.

tpo: How is the unit hardened against tough environments?

Jones: The enclosure is made of acrylic ABS plastic that is designed to handle outdoor environments. The material is similar to the center console

“The unit is designed to operate in all climates, from 125 degrees F and high humidity to 32 degrees or colder.”

RONNIE JONES

of a boat; it's designed to be out in the weather all the time. We reinforce that with fiberglass on the inside to give it strength. Then we have sealed compartments that exclude anything from the outside. All openings except where the refrigeration module is located have rubber seals to keep external air and rain from affecting the electronics and the samples.

tpo: How do operators get access to remove the samples?

Jones: There is a single latch on the compartment where the sample container is sitting. The sample containers are optional items. Customers have a choice of a 2.5- or 5-gallon container. They can also choose the length of suction tubing and whether they want a PVC or stainless steel strainer.

tpo: What installations do you have so far?

Jones: We have units in different places in northern U.S., in the panhandle of Florida, and in Alabama. We installed a unit for one of our customers on a Tuesday and did a text follow-up on Thursday. Their response was, “The sampler is awesome ... some may even say it's life-changing.”

tpo: Is any particular size of facility a sweet spot for this technology?

Jones: The state regulatory agency probably would dictate the need to have an automatic sampler. Another group would be wastewater treatment plants that just want to automate their process. For example, if they are required to pull a sample every hour, that's hard to do late at night if you don't have a 24-hour staff. An automatic sampler is the way to do that. **tpo**



An aerial view of the St. Cloud Energy, Nutrient and Water Recovery Facility shows two of its four arrays of solar panels.

Touching All the Bases

ST. CLOUD SUSTAINABILITY PROJECTS SAVE ENERGY, SAVE MONEY, IMPROVE PERFORMANCE, REDUCE MAINTENANCE, AND JUSTIFY A NEW TREATMENT FACILITY NAME

By Steve Lund

At the St. Cloud Wastewater Treatment Facility, success led to more success with energy and sustainability projects.

Things moved so quickly that the facility exceeded its 20-year goal for the share of energy produced by on-site renewable resources in just five years. When a second biofuel-burning generator comes online later this year, the plant will almost certainly be producing as much energy as it consumes, or more.

“We’re coming to the point where we need new energy goals,” says Tracy Hodel, public services director for the city of St. Cloud, in central Minnesota. The wastewater plant (17.9 mgd design, 10 mgd average), uses biogas to fuel a generator and heat the digesters. It also generates electricity from four solar arrays — 20 kW, 40 kW, 220 kW and 248 kW.



A rooftop solar panel and digesters at the St. Cloud facility.

TOWARD NET-ZERO

“In 2019 we produced 88% of the power we consumed on site,” Hodel says. “If you include some subscriptions that we have to a community solar garden, we were 99% with our energy coming from renewable resources. We have a second generator coming online, and by 2021 we should be net-zero.”

But energy production is just one of the heavy hitters in St. Cloud’s sustainability lineup.

Energy conservation. After finishing a full biological nutrient removal project in 2013, the plant staff did an energy assessment with energy provider Xcel Energy. That led to savings of 1.6 million kWh per year through a change to LED lighting, upgrades to the HVAC system, and refinements to blower controls and valving.

Nutrient harvesting. In 2018, St. Cloud added the Ostara Nutrient Recovery Technologies process, which removes phosphorus from effluent and produces struvite, a marketable ingredient for fertilizer. The facility produces about 100 tons of struvite a year.

Class A biosolids. St. Cloud switched from Class B liquid biosolids to a Class A product through the Lystek system. The material is dewatered in a centrifuge to 10% to 15% solids cake, which is then treated with mixing, steam and potassium hydroxide. “It liquefies the product, so it acts like a 3% to 4% solid, kind of like ketchup,” says Hodel. “It’s complete resource recovery. Nothing is going to waste.” The addition of potassium makes the product even more appealing to farmers. The city didn’t have to replace or change its field application equipment.

High-strength waste. Waste from food and beverage producers goes directly to the anaerobic digesters. “A large portion of our energy production comes from the high-strength waste,” Hodel says. “They pay us to take it, but it’s a deal for them, too. They would have to pay a lot more to have it hauled away to a different facility, or build their own pretreatment facility to process it.”



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The integrated touchscreen controls give you the ability to specify the sample size and program times or flow intervals to collect samples. Controls also allow you to digitally control temperature within the sample compartment.

The WAVE™'s powerful vacuum system generates stronger purges that remove contamination and can draw samples from greater distances, up to 200 Feet. The WAVE™ can pull samples with vertical lifts of nearly 30 feet and provide consistent accurate sampling with no need to worry about replacing costly internal tubes. With that, the WAVE™'s vacuum system exceeds EPA transport velocity.

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TEAM VENTURE

Hodel credits the plant staff for continually coming up with ideas for sustainability projects and taking inspiration from past successes to transform their workplace into a resource recovery center.

“Our staff identified that we have so much more potential than just wastewater treatment,” Hodel says.

“They started thinking about what else we can do here. We’re already making a huge difference by reducing the pollutant load into our receiving waters, but what else can we do? That drive, that passion just triggered these projects not only to start but to succeed.

“Nearly every project we have done to date has been saving the city money and reducing operational and maintenance costs, especially the energy projects. They’ve been successful, so we’re just feeding off each one: This one’s good; let’s try this.”

“Our staff identified that we have so much more potential than just wastewater treatment. They started thinking about what else we can do here.”

TRACY HODEL

institutions, mechanically separate out the paper and plastic, and put the food into the treatment plant digester to produce more biogas and Class A biosolids.

“We’re working on a pilot,” Hodel says. “I know the school districts and hospitals are looking for a place to put their food waste for their own sustainability goals.”

Appropriately enough, the treatment plant has been renamed the St. Cloud Energy, Nutrient and Water Recovery Facility. **tpo**

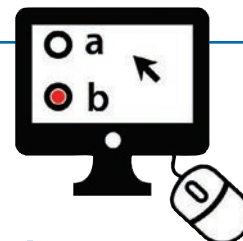
MORE TO COME

Several new projects are in the works. One is a partnership with the University of Minnesota and Beaver Island Brewery. The brewery sends its high-strength waste to the treatment plant, where it is turned into biofuel and Class A biosolids.

The biosolids are applied to a 10-acre field at the treatment facility that is planted with a strain of perennial wheat developed by the university. The wheat has especially long roots that absorb more than the usual amounts of phosphorus and nitrogen. The harvested wheat goes to the brewery as an ingredient.

The success of biogas production has prompted St. Cloud to consider further cleaning the fuel to produce renewable pipeline natural gas for sale to the power company.

Another project on the drawing board is diverting food waste from landfills. The plan is to take food waste from schools, hospitals and other



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Helping Blower Upgrades Pay

A NEW TESTING METHOD HELPS OPERATORS ACCURATELY DOCUMENT ENERGY SAVINGS AND SECURE AND MAXIMIZE INCENTIVES FROM ELECTRIC UTILITIES

By Thomas E. Jenkins, P.E.

Energy is the second largest expense in most water resource recovery facilities. In an activated sludge plant, for example, more than half of total energy consumption goes to the aeration blowers.

Operators looking to reduce energy costs naturally look at the blowers. Many blower-related energy conservation measures are available, including:

- Advanced process control to match airflow to demand
- Supplementing existing blowers with new right-sized blowers
- Replacing existing blowers with new high-efficiency models

These measures are often supported by electric utility incentive programs that pay customers to reduce their bills. A typical incentive covers up to half of project costs, including equipment, installation and engineering. The programs are generally financed by conservation charges on customers' utility bills.

An essential part of such projects is to document to the utility that the estimated energy saving will actually be realized. Here, measurement and verification is important, and a new test code for blower systems from the American Society of Mechanical Engineers enables this to be done reliably and accurately.

EVALUATING THE SYSTEM

Installing new blowers as replacements or supplemental units is a common energy-saving practice. The first step in M&V is to test the existing blower system and establish the baseline energy consumption. For blower replacement projects, before-and-after measurements of kilowatts/100 scfm provide a useful baseline. Plant operators are usually involved in the testing and data analysis of the existing system.

Once the baseline is established, the replacement blower requirements must be defined. Matching the design pressure and flow rate of the existing blowers is a simple approach, but it may not optimize performance under actual operating conditions.

Operators can provide right-sizing requirements based on their current and past operating experience. The new blowers may be rated for a lower design airflow to provide the turndown needed to meet current process demand.

Actual operating pressure is often lower than the original specified discharge pressure. In some cases, a large high-efficiency blower is provided for the base load and smaller, more flexible units are installed to trim the total air supplied to the process and match load variations.

TESTING CHALLENGES

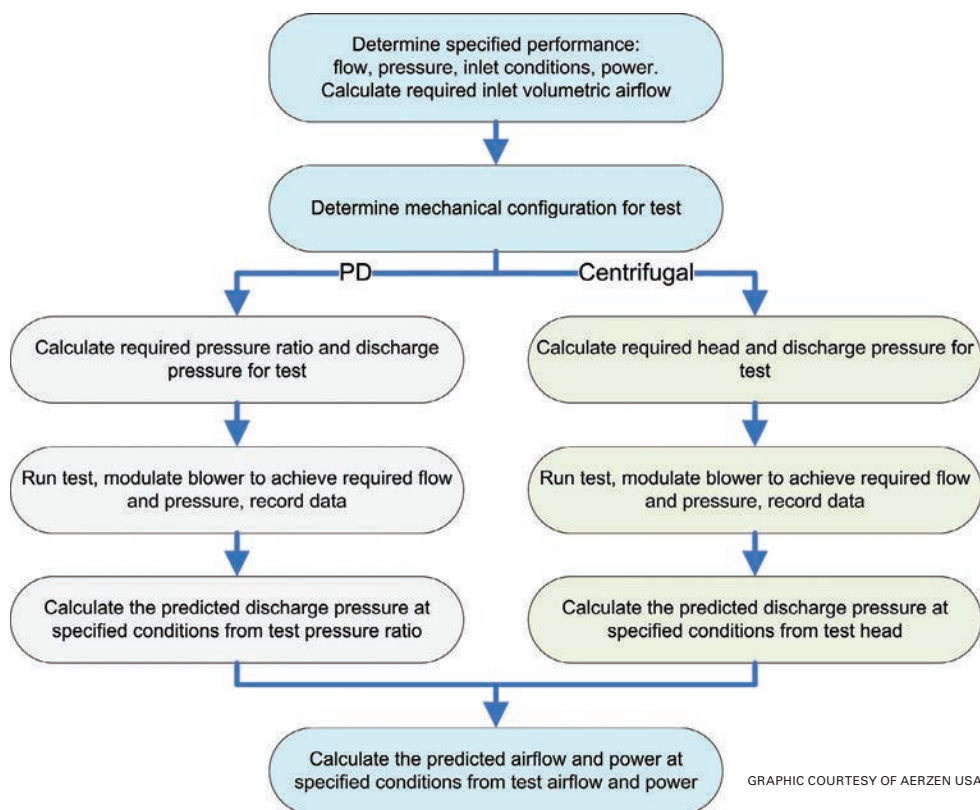
Once the blowers are selected and purchased, the second phase of M&V involves verifying the new blow-

ers' performance. To minimize disruption to plant operations, new blowers are typically tested before they are shipped from the supplier. Operators have an interest in specifying the test method and often demand to witness it.

In the past, selection of the appropriate test method was straightforward: The ASME Performance Test Code PTC 10 was used for centrifugal blowers and ASME PTC 9 for positive-displacement blowers. However, recent developments in blowers have complicated the picture.

One factor was the entry of foreign blower suppliers to the United States market. These suppliers wanted to use test methods identified by ISO — similar to the traditional ASME tests and yet with important differences.

A more significant problem was the introduction of packaged blowers. These complete plug-and-play systems generally include the blower, motor, variable-frequency drive, controls, filters, silencers and isolation valves in a factory-assembled, compact, sound-attenuated enclosure. Packaged units offer convenience and cost advantages over custom-engineered, field-assem-



GRAPHIC COURTESY OF AERZEN USA

Automated data collection simplifies the process of blower energy savings measurement and verification under the PTC 13 testing method.

bled systems, but they don't match the test configurations identified by the commonly used ASME codes.

Whether blowers are factory packaged or field assembled, the operator and the utility are concerned with total system power. The total power demand measured should include losses from motors and VFDs as well as filters and silencers — essentially any component between the blower inlet and the process connection. This is referred to as wire-to-air performance. The traditional test codes, developed to test bare blowers but not complete systems, were not suitable for establishing total system power demand.

Operators and utility staff were forced to accept the procedures and interpret the results of testing based on a supplier's modifications to traditional methods. This led to a lack of confidence that the results were comparable to the baseline system testing; doubts often remained that the test represented actual operating energy demands.

ASME PTC 13, the Wire-to-Air Performance Test Code for Blower Systems, provides true wire-to-air power measurement to accurately reflect all the operating energy blower systems require.

DEVELOPING A NEW CODE

The Consortium for Energy Efficiency, created in 1991 to assist utility energy efficiency program administrators, recognized the deficiencies in the blower testing methods and understood that it compromised M&V procedures. The organization approached ASME and requested a single test code that could determine wire-to-air power for any blower technology and system configuration.

The result is ASME PTC 13, the Wire-to-Air Performance Test Code for Blower Systems. The code provides true wire-to-air power measurement to accurately reflect all the operating energy blower systems require. It accommodates configurations from bare blowers to complete factory packages with all accessories.

Test configurations include the blower motor, control panel, and power conditioning equipment such as harmonics filters. Mechanical components that increase power demand, such as silencers, inlet filters, check valves and belt drives, are addressed. The code is extremely adaptable: any blower technology can be tested, and the procedures are nearly identical. Blower types covered include:

- High-speed gearless single-stage centrifugal (turbo)
- Geared single-stage centrifugal
- Multistage centrifugal
- Lobe-type (Roots) PD
- Screw-type PD

SIMPLE CALCULATION

Modern blower systems use a variety of control methods including throttling, guide vanes and VFDs. PTC 13 provides testing methods for all. Most test stand equipment for PTC 13 is identical to the equipment required for traditional testing. The principal exception is the need for high-quality electric power analyzers.

Ambient conditions during the blower test are unlikely to match those selected by the operator in defining required performance. In the older codes, the thermodynamic calculations used to predict site performance from test data were extremely cumbersome. On the other hand, the calculation methodology in PTC 13 is greatly simplified and was expressly developed to accommodate automated data collection and analysis. Most calculations are identical for all blower types.

A stack of raw data is of little use to operators comparing the blower system performance to either existing equipment or promised performance.

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PTC 13 stipulates that a report must be provided that describes the tested equipment, the specified performance parameters, and the expected performance parameters adjusted from test data to specified conditions. The operator may also require the report to include any special performance parameters needed to compare the new equipment to the baseline performance, such as kW/100 scfm.

Operators face many challenges in upgrading aeration blowers to reduce energy demand. One is verifying that the new blowers meet performance and efficiency expectations. The ASME PTC 13 Wire-to-Air Performance Test Code for Blower Systems was developed specifically for testing both conventional and state-of-the-art systems. Operators and electric utilities can use this code with confidence to meet their M&V requirements.

ABOUT THE AUTHOR

Thomas E. Jenkins, P.E., (tom.jenkins.pe@gmail.com) is president of JenTech, providing consulting services to the wastewater treatment industry. tpo

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Doing the Impossible

A TENNESSEE FACILITY TEAM REWRITES THE PLAYBOOK ON
NUTRIENT REMOVAL TO CLEAR THE WAY FOR A PLANT EXPANSION
ESSENTIAL TO ECONOMIC GROWTH IN ITS COMMUNITY

STORY: **Suzan Chin-Taylor** | PHOTOGRAPHY: **Martin Cherry**



“One of the key things we did was to include [in expansion decisions] every single staff member, even those who were very new and only on the job a short time.”

JOHN STRICKLAND

Effluent feeds the West Fork Stones River, helping to provide a healthy ecosystem for the wildlife.



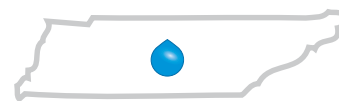
Anthony Pollock, plant supervisor, samples the sludge blanket in a clarifier.

When facing what seemed insurmountable odds to meet aggressive new effluent nutrient limits, the Murfreesboro Water Resources Department team members banded together.

They drew upon internal resources, skills and innovation to complete a treatment plant expansion that was financially viable, met the permit requirement, and provided a framework for capacity expansion and long-term reliability.

The Murfreesboro Water Resources Recovery Facility was built in 2000 and expanded by 50% in 2017 to a 24 mgd design capacity (average flow is 20 mgd). The plant culminates decades of diligent effort by the city staff and consulting engineers to achieve dramatic reductions in effluent nitrogen and phosphorus.

The plant has received four Peak Performance Gold Awards from the National Association of Clean Water Agencies. Closer to home, it has earned two Excellence in Beneficial Reuse Water Awards and eight consecutive Operational Excellence Awards from the Clean Water Professionals of Kentucky and Tennessee.



Murfreesboro (Tennessee) Water Resources Recovery Facility

www.murfreesborotn.gov

BUILT:
2000 (expanded and upgraded 2017)

POPULATION SERVED:
160,000

TEAM MEMBERS:
30

FLOWS:
24 mgd design,
20 mgd average

TREATMENT LEVEL:
Tertiary

TREATMENT PROCESS:
Oxidation ditch;
deep-bed mixed-media
sand filtration

RECEIVING WATER:
West Fork Stones River,
cropland irrigation

BIOSOLIDS:
Landfilled

ANNUAL BUDGET:
\$9 million (operations)



The Murfreesboro Water Resource Department team includes, from left, Anthony Pollock, plant supervisor; John Strickland, plant manager; Josh LeMay, assistant plant supervisor; Jelisey Russell, plant operator; and Terry Suber, senior plant operator.

REUSE AND RAINBOWS

To limit phosphorus in the effluent, the Murfreesboro Water Resource Department purchased two farms — 150 acres in 2001 and 425 acres in 2005 — for irrigation with recycled water.

The farms receive some of the effluent otherwise released to the West Fork Stones River. Diverting that water and the phosphorus it contains reduces phosphorus loading to the creek and helps the facility comply with its permit.

When the utility purchased the farms, neighbors at first were opposed. Now, they appreciate the farms for the open green space they provide in a community that is developing rapidly. The spray irrigators create rainbows that residents enjoy seeing.

The farms raise hay for sale to livestock farmers. This bonus crop comes in handy during periods of drought, providing feed that farmers otherwise would not have had. The farms are droughtproof, remaining lush and green regardless of the weather. So, what's not to love?

It won a 2014 Plant of the Year award from the Tennessee Water and Wastewater Association, and achieved STAR Operations Designation from the Tennessee Department of Environment and Conservation in 2014. The Water Resource Department has been recognized as a National Utility of the Future Today.

BACK THROUGH TIME

The original Murfreesboro treatment facility was built in 1961, discharging about 200,000 gpd to the West Fork Stones River, a small creek. A new oxidation ditch facility was completed in 2000 with a design capacity of 16 mgd (average flow 12 mgd).

Murfreesboro, a Nashville suburb that became one of the nation's fastest growing cities, eventually saw a need for even more capacity. However,

the Tennessee Department of Environment and Conservation, "based on known plant performance," refused to grant a permit for an expansion, convinced that the larger facility could not meet new permit requirements of 520 pounds of nitrogen and 307 pounds of phosphorus per day.

"Those numbers were based on a flow of 16 mgd, and we had to demonstrate that we could achieve those numbers if the flow increased to 24 mgd," says John Strickland, plant manager.

The expansion was critical to the community's future prosperity: A study by the Smith, Seckman and Reid engineering firm found that a moratorium on new sewer connections, essentially stopping growth in the city, would cause an immediate negative financial impact to residential and commercial property values along with a loss of \$695 million over approximately five years in underdeveloped property and future tax collections.

"When you're talking about that kind of economic impact, there was no way for us to accept TDEC's answer," says John Strickland, plant manager. "At the time of that requirement, the plant had been online for 12 years. We were unsure how we could double nitrate removal, and the facility was never designed for phosphorus removal. So we took all that we knew about operations and our plant, developed a very forward-thinking plan, and executed it."

DEVISING THE SOLUTION

The plan was to improve nitrogen removal and enable biological phosphorus removal (bio-P) by taking the existing oxidation ditches, with aerobic and anoxic zones for nitrification-denitrification, and creating two additional habitats — luxury phosphorus uptake and anaerobic — within the same structure.

The three aerators on each of the facility's two oxidation ditches would be manipulated to create the different habitats. The sequence of habitats from raw water to secondary effluent was anoxic, anaerobic, luxury uptake, aerobic (for ammonia removal).

Since facility automation was extremely limited, the existing and new habitats would be created and sustained by operators manually adjusting the aerators to specific speeds. Strickland and his team had one year to document to TDEC that the changes in operation could achieve the needed nutrient reductions.

"No one had ever done this type of extra zone creation in oxidation ditches before, so we called in the gurus," says Strickland. "None of the national experts we spoke to could solve our problem, so we had to figure it out on our own."

Operators had to collect and analyze multiple samples from each zone daily for dissolved oxygen content. "To give you an idea of the difficulty we faced, we would receive test information days after the tests were taken. From

“You never know where nuggets of innovation or wisdom will come from. So consider the process of innovation and the process of problem-solving to be like gold mining.”

JOHN STRICKLAND



Jelisey Russell with the Water Resources Recovery Facility's SCADA system display.

an operator standpoint that's like riding a bull backward and blindfolded down a lightning bolt."

PLENTY OF STRESS

DO levels were taken with a single portable probe. Because of these delays in data after aerator adjustments, operators had to make anticipatory judgments on what was to happen and be extremely sensitive to the changes being made. They had to know hour-by-hour what was happening to stay on top of the needed adjustments.

The process subjected the operators to considerable stress and fatigue. "I had never seen a staff get battle-weary the way we were," Strickland says. But with stakes so high, failure was not an option, and the team kept pushing through: "We were creating a new playbook. Even if automatic control had been available, no one would have known what to set it to, so we still would have been playing by ear."

At the end of the year, the plant team had tripled nitrate-removal efficiency and increased phosphorus-removal efficiency by 100%. The changes also saved the plant \$130,000 per year on electricity through the changed aerator operation. Based on the result, TDEC granted a permit for the plant expansion.

FAST FORWARD 2017

With the permit in hand, Murfreesboro went forward with design for the expansion with an eye toward customer service, constant innovation and financial viability. "As we designed the new plant, we were largely using the technology we had used before, because it had worked well," Strickland says. "But as a group, because we are under a constant innovation framework, we were going to kick the tires on everything again."

For example, the plan called for expanded sludge and biosolids handling facilities at a cost of \$3.5 million. But the team determined that through a process redesign, the existing building could accommodate the higher demand.



The biosolids produced at the high-performance Murfreesboro facility are dewatered on eight rotating sludge presses (Fournier Industries) and are currently being landfilled.

In total, consulting engineers originally projected the cost of the plant expansion at \$36 million. However, through the team's efforts to repurpose, reuse and redesign the solids-handling system, the sand filtration system and other components, and sludge handling components, the project came in \$6 million under that figure.

"This financial consciousness, along with knowing the operation so well, resulted in no real impact on the ratepayers as a result of the expansion," Strickland says.

PLAYING A SYMPHONY

Throughout the expansion, decisions involved the entire staff. "One of the key things we did was to include every single staff member, even those who were very new and only on the job a short time," Strickland says.



Anthony Pollack inspects step screen equipment (WesTech Engineering) in the headworks building.

Murfreesboro Water Resources Recovery Facility PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT
BOD	200 mg/L	2.0 mg/L	4.0 mg/L
TSS	650 mg/L	0.5 mg/L	32 mg/L
Nitrogen	4,800 lbs/day	250 lbs/day	520 lbs/day
Phosphorus	1,100 lbs/day	200 lbs/day	307 lbs/day

“We refer to this as the universal right to improvement. That means anyone can suggest an improvement. Regardless of title, position or longevity, anyone can put forward a proposal. We fostered a learning organization, and team members were buying textbooks and doing their own research because they were excited about being able to share ideas.”

This open platform was of great value in determining the best way to automate the oxidation ditches. Manual operation had been successful, but was unsustainable; automation was essential to the expansion plan.

The oxidation ditches were automated by creating a three-way partnership of innovation involving Murfreesboro and two manufacturers. The Carousel oxidation ditches (Ovivo USA) are fitted with Excell aerators and automated through the company’s Oculus control system. Added control was achieved by incorporating Hach probe/sensor technology.

TEAM ENTERPRISE

All the teamwork, sharing, history, and hands-on experimentation led to a high-performance facility. The expanded plant consists of 17 buildings. The main pump station is equipped with three 500 hp and two 250 hp pumps from Hidrostral Pumps and Trillium Pumps USA Inc. - WEMCO. The headworks building has four step screens (WesTech Engineering) and two PISTA grit chambers (Smith & Loveless).

The six 2 million-gallon secondary clarifiers (Walker Process Equipment, A Div. of McNish Corp.) center-drive, spiral rake units. Tertiary treatment is provided by 13 deep-bed, mixed-media sand filters (De Nora Water Technologies). Two channels with TrojanUVSigna units provide disinfection units; water for reuse is chlorinated. The final effluent is enriched with oxygen by ABS TA submersible aerators (Sulzer Pumps Solutions).

Biosolids are dewatered on eight rotating sludge presses (Fournier Industries) to a minimum of 12.5% solids. The material is now being landfilled, but a small-scale test dryer unit (Gryphon Environmental) is operating as the team evaluates producing a Class A-EQ product.

The 30-member facility team encompasses plant operations, maintenance, laboratory, instrumentation and control, and industrial pretreatment personnel. Key team members include: Josh LeMay, assistant plant manager; Anthony Pollock, plant supervisor; Steve Huffman, pretreatment coordinator; Mike McMurtry, FOG program coordinator; James Ross, maintenance supervisor; Felicia Fletcher, laboratory supervisor; and Greg Hicks, biosolids supervisor.

Strickland notes that maintenance is gaining importance as the plant ages.

“With the maintenance team we’ve installed a mindset that I borrowed from the airlines,” he says. “In the airline maintenance industry they have what they call a cannot-fail mindset, which means there is no circumstance in which the airplane can fall out of the sky due to a maintenance issue. We’ve adopted that same mindset. We’ve agreed we will never be out of compliance because of a maintenance issue. The team has stayed on top of it and has done very well with meeting that goal.”

Instrumentation and control have become more essential as the facility has become more automated.

BLAZING THE TRAIL

Murfreesboro achieved what many considered the impossible when facing restrictions and rejections from regulators. Trying something new, with a high risk of failure and permit violation, has brought many rewards.

“When accepting one award, the gentleman who presented it to me stated ‘The most amazing thing about what you’re doing is that this will be the way it will be done everywhere going forward,’” Strickland says. Murfreesboro’s success with biological nitrate and phosphorus removal is spreading across the country and around the globe: Visitors have come from Egypt, Guam, and elsewhere around the world to see the innovations in treatment.

“You never know where nuggets of innovation or wisdom will come from,” Strickland says. “So consider the process of innovation and the process of problem-solving to be like gold mining. Be willing to get in there and dig in the dirt to sift through all of the unusable to get to the golden nuggets that will bring about real impactful change.” **tpo**

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Poetic License

A CONTEST FOR WATER REUSE OPERATORS IN THE PACIFIC NORTHWEST PUTS A NEW SPIN ON FRIENDLY COMPETITION AT AN ANNUAL CONFERENCE

By Sandra Buettner

Through 11 years in the water industry, Jay Irby has earned five licenses. Now he can add another: poetic license.

Irby, water renewal operator in Boise, Idaho, won first place in a poetry competition at the 2019 Idaho Reuse and Operators Conference (IROC). He entered because he likes to make people laugh and he liked the \$100 prize money.

"The last time I put a poem together was in high school, but water reuse is so important to our society and I thought I could have a little fun with this competition," Irby says. IROC ran the contest out of a wish to get creative and change things up for the annual meeting. The contest for water operators joined an existing children's art and poetry contest.

COLLABORATIVE VENTURE

The Idaho Department of Environmental Quality began hosting the WaterReuse conference in 2005. Then in 2013, the Pacific Northwest Water-Reuse Association section collaborated with the DEQ to create an event that the two organizations take turns hosting. In 2019, the Idaho operators section of the Pacific Northwest Clean Water Association joined in, and more than 550 people attended.

The art and poetry contest for children began as outreach for the 2017 Water Reuse conference in Boise. The idea was to teach grade K-12 students about recycled water. Students watch online videos about water reuse with their families to give them a background on the subject. One goal is to teach families that water and wastewater treatment for recycling water is important, and that the professionals in this industry genuinely care.

Tressa Nicholas, a DEQ wastewater analyst and conference planner, observes, "By hosting the contest, you're getting the community engaged, because kids include their parents, and teachers can include water reuse in their curriculum. This contest helps to create a bridge between environmental education and how it can be applied to the students and their families."

ART AND POETRY

The contest, now in its third year, is held with the annual Water Reuse conference. It is open to all K-12 students from Washington, Oregon and Idaho. It's promoted by volunteers from the conference planning team to members in their communities and schools and to water education centers such as the Boise Watershed and the LOTT Clean Water Alliance. Students have three months to submit their entries.

Posters and poems must be original works with a water reuse theme. So far, the number of entries has ranged from 100 to 200 per year.



WATER RENEWAL

By Jay Irby

*I work and work all day long,
helping water roll along.
Inject some air, ferment some sludge,
Adjust the process, it's what I love.
Protecting my river, my friends, my state,
I won't get rich, but the pay is never late.
Clean water leaves, the fish respawn,
resources are renewed for years to come.*

Separate first-, second- and third-place prizes are awarded to poetry and art winners for grades K-6 and for grades 7-12. First place winners receive \$100. Conference sponsors also donate prizes for the children.

Winning scores are tallied before the conference, and winners are announced at the event. Most winners are notified before the conference so they can attend with their families. "The children read their poems on stage, and everyone's heart just melts," Nicholas says.

OPERATORS JOIN IN

For the 2019 IROC conference, the planning team members realized that in order to bring art, poetry and water together they should also invite operators, as many of them are poetic and creative.

The expectation is that more operators will share their recycled water poetry in future years. Prize-winner Irby started his career with Boise. He now works as a water reuse contractor for that city and for a number of smaller rural utilities in Idaho that do not have their own staffs. Those communities range from 800 residents and 60,000 gpd to 200,000 residents and 30 mgd.

All winners from the contests were recognized at a luncheon during the conference. The children and Irby read their poems while a large screen in

the background displayed their entries. The winners received their prize money and other gifts while on stage.

Many volunteers work together to support the contest, including Sharonne Park, with Jacobs. "We received so many positive messages from parents and teachers that the students really took this competition seriously," Park says. "The well-developed artwork the children submitted showed that they really learned about wastewater treatment and recycled water." **tpo**



The art and poetry contest is held with the annual Idaho Reuse and Operators Conference and is open to K-12 students from Washington, Oregon and Idaho.



Wings of Wonder

A MILKWEED PATCH SPROUTED AT THE GREATER SUDBURY WASTEWATER TREATMENT PLANT. THE TEAM AND COMMUNITY GROUPS TURNED IT INTO A HAVEN FOR MONARCH BUTTERFLIES.

By Jeff Smith

During summer, hundreds of migrating monarch butterflies are attracted to the Greater Sudbury Wastewater Treatment Plant. A nearly half-acre milkweed patch on the back side of the chlorine contact chamber and near its receiving water, Junction Creek, provides a habitat for the butterflies' life cycle.

Michael Loken, manager of wastewater treatment for Greater Sudbury, in Ontario, says the milkweed started showing up at the plant (42 mgd/design) five to 10 years ago. "No one really can pinpoint the exact time, but it's interesting and we have been trying to encourage it to grow," says Loken.

Since then, the plant staff, along with community interest groups, has nurtured the monarch breeding area and expanded it to others. The motive force behind monarch habitat preservation at the plant and along Junction Creek is Dr. Joe Shorthouse, a retired professor of entomology at Laurentian University. "Joe first identified the growth of milkweed at our plant and encouraged us to just let it grow," says Loken.

LET IT GROW

Among community groups that have worked with the plant is the Junction Creek Stewardship Committee, a nonprofit volunteer organization that focuses on improving the large urban waterway through research and monitoring, restoration projects and education. The group promotes the creek's ecological benefits and works to connect the community with it.

"The stewardship committee looks after the creek, and they suggested we let the milkweed grow, and it grew quickly," says Loken. "It likes the sandy soil, and it stabilizes the creek bed and adds to the aesthetics."

ABOVE RIGHT: A monarch butterfly feeds on the nectar before laying her eggs on a milkweed plant. LEFT: A monarch caterpillar feeds on milkweed growing near the chlorine contact chamber at the Greater Sudbury Wastewater Treatment Plant.

Lozen is manager of all 10 of Greater Sudbury's treatment facilities, plus two lagoons. Plant operators have been instructed by Dr. Shorthouse on how to properly transplant the milkweed. "We have actually transplanted milkweed to some of our other facilities," says Loken. "Some of them have been successful, and some have failed."

THE LIFE CYCLE

Once the transplant is established, no maintenance is required. The milkweed is noninvasive and does not damage tanks or equipment. "It's not like a willow tree that deeply buries its roots to find water, so we don't see any issues with it up against concrete or any of our tanks," Loken says.

The monarchs arrive in early spring, find milkweed to feed on, lay their eggs and then die almost immediately. During a six-week cycle, caterpillars hatch from the eggs, feed on the milkweed leaves until mature, and then form chrysalises, from which the butterflies emerge. Depending on the weather, one to three generations of monarchs live in Sudbury between May and September.

When the weather turns cold, the last generation migrates to the mountains west of Mexico City and can live six to eight months. In early spring, they head back to Greater Sudbury, but with two or three stops along the way, at each stop each repeating the life cycle.

“The monarch has a fantastic life cycle, and encouraging that life cycle to continue is really wonderful.”

MICHAEL LOKEN



Michael Loken, manager of wastewater treatment for the City of Sudbury, overlooks the milkweed patch that has grown near the facility's chlorine contact chamber.

How the monarchs navigate to their migratory destinations is unknown. Each year, Dr. Shorthouse applies identifying tags to the wings of many before their trip south. “Joe has tagged hundreds and hundreds of monarchs and wants to find one that was tagged here at our wastewater plant,” says Loken. “He thinks that would be the most amazing story.”

TAKING TOURS

Because the milkweed patch at the plant is not readily visible from outside the plant, most residents see it only during plant tours. During pre-COVID-19 times, tours were encouraged and well attended, especially among school children.

“We get lots of high school and college students who learn about the facility and how we are part of the community,” Loken says. “It’s also nice to show them that we’re doing things outside the scope of wastewater treatment, that we are doing things that are encouraging biodiversity and supporting this beautiful species that is at risk.”

Providing for and promoting the milkweed at the plant has proved to be good for public relations, too. Dr. Shorthouse wrote an article about the efforts of operators and staff that was published in an August 2019 edition of the *Sudbury Star* newspaper.

The milkweed patch lets people know that the plant is not just another industrial site: “Milkweed has a pleasant smell and helps with any odor associated with the facility. That makes us a little more amenable to our neighbors. The monarch has a fantastic life cycle, and encouraging that life cycle to continue is really wonderful.” **tpo**

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An elevated tank stores reclaimed water for irrigating the sport fields next door to the treatment plant in Clermont.

Sweating the Small Stuff

EFFICIENT OPERATIONS AND AN EMPHASIS ON RECYCLING
ADD UP TO AWARD-WINNING PERFORMANCE
FOR THIS FLORIDA WATER TREATMENT TEAM

STORY: **David Steinkraus** | PHOTOGRAPHY: **Preston Mack**

The City of Clermont is lucky because its source water is so clean. But that doesn't mean the water plants are free of challenges.

Those can be found in the thousands of details that need attention if a plant is to operate at top efficiency, says Duane Land, water and wastewater operations manager. By taking care of those details, Clermont has consistently won awards from the Florida Department of Environmental Protection, while meeting the demand from a community that grew by 27% from 2010-19.

"We've been very proactive so that we won't get caught behind the growth curve," says Land. The city owns two water plants; the East plant has won most of the awards and is noteworthy for not only treating water but recycling water from the wastewater treatment plant nearby.

Clermont is 25 miles west of Orlando (or, as Land puts it 22 miles from Disney World). Yet the city doesn't call itself a bedroom community. "We are a rural lifestyle community for cities," Land says. People come to Clermont to escape. Immediately west of the city, the land turns quickly from urban to rural.

GREAT WATER

Raw water processing is simple. Eight wells feed the city's two water plants. The water is chlorinated and passed to a storage tank. "We are truly blessed being here in the center of the state," Land says. "We don't adjust pH. We don't strip and recarbonate."

Water from the Floridian Aquifer is that good. Hardness is moderate, and the water doesn't promote scale in pipes. Two more wells are in the planning stages. The present eight wells are served with pumps varying from 100 to 200 hp (Goulds Water Technology, Weir Floway, and Peerless Pump). The distribution system

uses one 75 hp pump and four 200 hp pumps, all Peerless pumps with motors from U.S. Motors (Nidec Motor Corp.).

Given customer demand, Land and his staff don't have the luxury of running pumps only during off-peak hours to minimize electricity cost. Instead, they've figured out what combination of pumps keeps the system charged at the lowest cost. For example, some wells lose head during the day, making them inefficient to operate, "But I can run them 2 or 4 o'clock in the morning," Land says.

He and his team realized that with variable-frequency drives, a 200 hp pump running at about 85% of rating is just as efficient as a 75 hp pump running at capacity.

RECYCLING FORESIGHT

On the reclamation side, 3.2 to 3.3 mgd of wastewater flows to the water treatment plant and is processed for irrigation. To remove organics and most pathogens, the plant is changing from upflow sand filters to the Aqua MegaDisk filters (Aqua-Aerobic Systems).

Recycled wastewater is chlorinated and sent to storage before being pumped out through purple pipes. About 93% of wastewater reaching the plant is returned to city residents for irrigation — about 1 billion gallons per year. Two large storage ponds at city golf courses hold excess recycled water.

Such large-scale reuse is possible because of farsighted management. About 35 years ago, the eastern two-thirds of Clermont was covered with citrus orchards. Several hard freezes ruined the business, and the land was developed. The city required installation of purple pipe throughout that area. The western side of the city, the original Clermont, won't get that because of the expense of retrofitting with purple pipe.

Joshua Brennan, dual licensed operator, flushes a fire hydrant.





Rick Laney, chief water operator, reads the water pressure at the high-service pump.



Jay Buttram performs maintenance on the backup generator (Cummins Power Products).

Even though residents like green lawns, a water conservation program emphasizes native plants that are stingy water users. “We’ve got native grasses that grow a root depth of 10 feet just to survive,” Land says.

Evie Wallace, the city’s water conservation officer, visits homeowner associations to explain the city’s irrigation plan and to encourage people to install irrigation systems with rain gauges that shut off irrigation after rainfall.

Irrigation through purple pipes is scheduled based on home addresses. Even-numbered homes receive water two days a week, and odd-numbered

DIRECT POTABLE REUSE ON THE HORIZON?

Clermont already uses recycled water for irrigation, and for many years its building code has required purple pipe in new subdivisions so that homeowners can use recycled water.

That raises an obvious question: How long before the city takes the next step to potable reuse?

“It’s not whether it’s going to happen but when,” says Duane Land, water and wastewater operations manager. “I doubt if I’ll see it in my lifetime. My grandkids may see it.”

It’s something he has thought about quite a bit. Clermont doesn’t have the source water quality challenges other communities face. The current treatment process requires very little overhead because water from the Floridian Aquifer requires only chlorination, but new contaminants flowing into the aquifer may dictate changes.

Land sees the detection and measurement of the spectrum of contaminants turning up in raw water sources as a key challenge for the Clermont plant. “If I have to start removing things from the water, what’s that price going to be?” he asks. “What’s the equipment going to be?”

He believes recycling water ultimately may prove less costly than treating heavily contaminated groundwater subject to strict government regulations. And then there is the question of quality. Recycling and reusing water may end up being safer than pumping it out of the ground.

homes receive water on two other days. During winter, the dry season, irrigation is cut back to one day per week per house.

Rates are structured in two tiers, and users of less water pay the lower rate. Homeowners are encouraged to switch to low-flow fixtures, and that is having an impact at the wastewater treatment plant where the nitrogen concentration has increased because the volume of water is less. That has required slowing the treatment process to compensate, Land says.

As the city is growing, so is reclamation. There have been four plant expansions, and a fifth is in the design stage. Capacity will expand from 4 mgd to 6.5 by fall 2022 if the project remains on track.

HARD-WORKING TEAM

The people who make the Clermont plant work so well are: Rick Laney, chief water operator; and Jay Buttram, Al Pagan and Jodi Pearson, Class C

East Water Treatment Plant Clermont, Florida

www.clermontfl.gov/departments/environmental-services/water-wastewater.shtml

BUILT:
2008

POPULATION SERVED:
50,000

SERVICE AREA:
10 square miles

EMPLOYEES:
5

FLOWS:
6.9 mgd design/2.6 mgd average

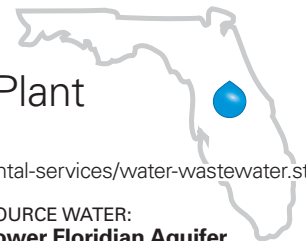
SOURCE WATER:
Lower Floridian Aquifer

SYSTEM STORAGE:
3.9 million gallons

DISTRIBUTION:
250 miles of water mains

ANNUAL BUDGET:
\$2.8 million (operations)

KEY CHALLENGE:
Detecting and measuring unregulated contaminants



operators. All are also certified for wastewater treatment although not to the same level as for water.

Dual certification allows the city to cover both water and wastewater plants with fewer people. Someone is on duty for water and wastewater for eight hours every day, seven days per week; if needed the water plant staff can help at the wastewater plant.

Another testament to the skill of the Clermont team is its award history. In 2019, the plant received its eighth consecutive Plant Operations Excel-

lence Award for a medium system in the Central District of the state Department of Environmental Protection.

“We all just taught each other what we knew, and it’s been working out pretty well.”

DUANE LAND

“As much as I’d like to say five of us did all this, the award is a reflection on the city as a whole,” Land says. “Five of us can’t take credit for it as much as we’d like to.”

The award is a recognition of support from the city and for a job that most people don’t think of, even in the midst of the coronavirus pandemic. “If there isn’t water, we don’t have a hospital,” Land observes.

When he came to Clermont in 1999, Land was a dual-licensed operator; he taught the other workers. Everyone had to do everything, from running plants to maintaining the distribution system. Now, team members are more specialized. With retirement only a few years away for him and Laney, Land is also looking toward the next generation of operators.

His present team is diverse. Pagan has a business degree, Laney maintained electronics in the Air Force, and Pearson is in college, studying biology and business. “We all just taught each other what we knew, and it’s been working out pretty well,” Land says.

His people may not make the money they could in the private sector, but there is stability. “They feel accomplished,” Land says. “They look forward to coming to work.” **tpo**



Duane Land, water and wastewater operations manager

The team at the East Water Treatment Plant includes, from left, Jesse DelValle, dual licensed operator/asset management; Jodi Pearson, Class C operator; Joshua Brennan, dual licensed operator; Duane Land, water and wastewater operations manager; Jay Buttram and Al Pagan, Class C operators; and Rick Laney, chief water operator.



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Glad to Lend a Hand

KRISTI STEINER, WEF'S 2020 OUTSTANDING YOUNG WATER ENVIRONMENT PROFESSIONAL, HAS PROSPERED FROM INDUSTRY INVOLVEMENT AND ENCOURAGES OTHERS TO DO LIKEWISE

By Ted J. Rulseh

Kristi Steiner first took an interest in water while in middle school. Today she is an associate project manager with the Jacobs engineering consultancy, specializing in water projects.

Steiner, winner of the 2020 Outstanding Young Water Environment Professional Award from the Water Environment Federation, has been active in the organization for several years. The award recognizes her contributions to WEF and to the wastewater collection and treatment industry.

Steiner's career has thrived in part through involvement with industry associations. She serves on the WEF Students and Young Professionals Committee and has helped plan several Young Professional Summits hosted jointly by WEF and the AWWA.

Steiner serves on the board of the Pacific Northwest Clean Water Association and is a past chair of its Students and Young Professionals committee. She represents the PNCWA in the WEF House of Delegates.

On the career side, Steiner earned a bachelor's degree in civil engineering from North Carolina State University and a master's in that field from Virginia Tech. She has held several positions with engineering firms and worked for a few years with Clean Water Services in Oregon before taking her current position.

Steiner talked about her career, the importance of industry involvement, and the need for more young water professionals in an interview with *Treatment Plant Operator*.

tpo: How did you get involved in WEF and its young professionals organization?

Steiner: I got involved with WEF in 2012-13 when I was at Virginia Tech. John Fletcher of Duke's Root Control became my instant mentor and introduced me to his connections. He kept introducing me to people and talking me through how to network, and he got me involved with WEF. I joined the Students and Young Professionals Committee and have been involved in the Young Professionals Summit since 2014. It's a great way to build friendships. People I have met through WEF have become my friends all over the country.

tpo: How would you describe the Young Professionals Summit?

Steiner: Every year WEF and AWWA alternate who leads the summit. It's a one day summit focused on developing and connecting young professionals in our industry from all over the U.S. and Canada. It is always attached

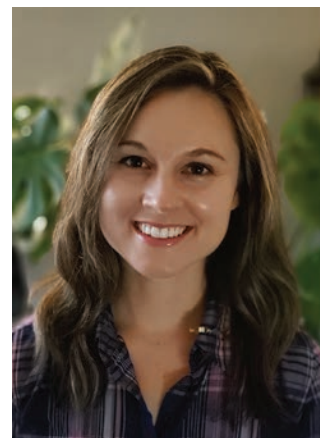
to the Utility Management Conference. Last year I was the programming committee chair. This year I'm vice chair of the summit. Next year I'll be chair of the summit, and then I will age out. I have seen the summit transform over the years.

tpo: In what way has the summit transformed?

Steiner: When I started it was very much conference style, where people give talks and you have breakout sessions. Over the years it has transformed to where there is more interaction and more opportunity to network. You meet enthusiastic young professionals and learn from them, as well as from the speakers. Because it's attached to the Utility Management Conference, you get exposure to utility leaders. Often, the speakers and participants from that conference come over to our summit, so we get a variety of perspectives.

tpo: What is the composition of the summit attendees?

Steiner: We had 202 people at last year's summit in February in Anaheim. We get lots of engineers. A handful of operators attend. We get marketing people and some scientists, such as lab technicians. It's a healthy mix.



Kristi Steiner

“The young professionals I know are super energized. They want to be involved and they want to be leaders.”

KRISTI STEINER

tpo: What would you say to someone about the benefits of getting involved in the young professionals group?

Steiner: When you start your job, you get a lot of training in the tools you need, the hard technical training. The Young Professionals Summit offers a lot soft-skills development: people interaction, communication and presentation skills, tying data together and communicating it to your friends and people in the community who might not have a technical base or vocabulary. Those practical skills help you grow in your career.

“I would like to continue down the project management track.
I love working with clients.”

KRISTI STEINER

tpo: What do you feel was responsible for your winning the young professionals award?

Steiner: What may have tipped the scales was how the summit went last year when I led the programming committee. We challenged a lot of conventions, and I had great support from Megan Livak, the young professionals manager for WEF. Instead of traditional presentations and breakouts, we did a full day on communication. It included a session on connecting with your purpose led by consultant Erin Mosely and past WEF President Tom Kunetz. They explained how once you understand your own purpose, you can recognize other people's purpose and use that to guide your conversations, the way you manage projects, and the way you manage people.

tpo: What were some of the highlights of the summit program?

Steiner: Dianna Crilley from U.S. Geological Survey talked about communicating high-level data to the broad public base. Rogue Water, a communications firm, did a really fun bit on general water communications through storytelling. They used slides with only graphics and music, a very unusual way to get through to people. They broke it down to how the brain is receptive to different situations and what part of the brain is working when you're doing different things. They put it all to current music, brought in current events, and tied it all together to make it relevant to young professionals.

tpo: What opportunities were provided for networking?

Steiner: On the Sunday before the summit we do a service project. Last year we did a beach cleanup, and then we toured the Orange County Groundwater Replenishment System in Anaheim, California. On Monday we did a half-day leadership workshop with lunch and a lot of time to network together. Every night there are networking happy hours.

tpo: What do you see that young professionals need to help get them energized?

Steiner: The young professionals I know are super energized. I feel great about moving on and doing different things, because there are so many good people stepping up to take over roles. They want to be involved and they want to be leaders. I graduated from the WEF Water Leadership Institute in 2019, and I sat on the steering committee for it this year. The number of applications we get from young aspiring engineers, scientists and operators is really nice to see. The diversity is growing.

tpo: What will it take to attract more young people to the water sector?

Steiner: We need to do a better job of outreach. We need to be not just in high schools but in elementary and middle schools, because that's when kids' brains really start to think about what they're interested in, whether they know it or not. I decided I wanted to be in water during middle school, because my dad took me with him to a job site where a civil engineer was there and they were drilling a well. I talked to the engineer, and I thought it was so cool. It was the first time my brain put together how important and valuable water was. It directed how I chose my classes in high school and college.

Reaching out and making water fun for middle and elementary school kids is important. The other side of that is educating the parents, so they can have these conversations with their children. So it's not just an engineer who comes into a classroom and does some fun experiments. They get home and

hear from their parents and grandparents how important water is, and how they shouldn't be wasting it, and all the opportunities that come with it.

tpo: Have you done any outreach yourself?

Steiner: Before COVID-19 hit, the PNCWA Young Professionals Committee was planning a Waterpalooza with one of the schools. We were going to take over their outside area for a day, set up a series of science activities, and have a little day fair about water. We did that a couple of years ago in Boise, Idaho.

tpo: What about reaching out to older students?

Steiner: In 2019 the PNCWA implemented the Introducing Future Leaders of Water program, reaching out to college students, letting them come to our conference, and having programs to teach them about all the opportunities for them in water. One thing we learned from that inaugural class was that we need to get them on board sooner, not just for the one-day conference. That way, by the time they hit the conference, they're more ready to learn from the professionals they meet. Then afterward, we can follow up and ask: What are you interested in? What inspires you? How can we help you get connected with people?

tpo: Where do you see yourself in the years ahead?

Steiner: I would like to continue down the project management track. I love working with clients. One reason I came back to the consulting side was to work with utilities, help them solve their problems, and be part of the bigger solution. I also want to get more into people management and focus on making sure younger people coming up have connections to their leaders. I'd like to be a bridge between them, making sure they are getting technical, professional and personal growth through their workplaces. Ultimately, I would like to be in a position where I can manage people and help them get to where they want to go.

tpo: What advice would you give to young professionals on how to get involved in the industry?

Steiner: A lot of people see it as a daunting step to take. They don't know what to do first or how to find a place to get involved. But it's about reaching out to one person you know and asking for help to get connected.

tpo: What about reaching out to a group such as a WEF Member Association?

Steiner: I started in the Chesapeake Water Environment Association, and they were amazing. It's just a matter of reaching out – getting people to take that first step, have faith in themselves, and believe what they have to contribute is going to be meaningful. **tpo**



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Lab Renewal

A FLORIDA TESTING LABORATORY USES POLYPROPYLENE FUME HOODS AND CASEWORK TO DELIVER LONG LIFE AGAINST TEST PROTOCOLS THAT USE CORROSIVE CHEMICALS

By Kevin R. Murphy

The Hillsborough County Environmental Protection Commission laboratory provides environmental impact testing for chemical analysis of air, water and sediment samples at local, state and federal levels.

Growing demand for the commission's contracted services at the existing wastewater treatment facility made it necessary to upgrade all laboratories in the building. The final laboratory upgrade consisted of about 10,000 square feet, including dedicated space for organics, bacteriology, metals preparation, heavy metals, solids, dispensing and washing, and an open laboratory for basic oxygen and carbon testing.

As part of the project, the commission selected polypropylene fume hoods and casework with flame-retardant liner, supplied by LabAire Systems.

NEED FOR PROTECTION

The Hillsborough County (Florida) facility conducts a wide variety of procedures including metal analysis and BOD and TOC testing. Corrosive chemicals such as acids, bases and volatile compounds are used in the analyses, making safety a priority: Workers must be protected from fumes produced by these chemicals.

Those same chemicals can eventually cause significant damage to metal fume hoods and to traditional casework made of metal or wood. Because of the varying procedures and chemicals used, some rooms in the laboratory had to be separated by ventilation zones to minimize potential for cross-contamination.

The new laboratory and equipment also needed to meet the certification standards of the National Environmental Laboratory Accreditation Program for the Clean Water Act.

LabAire Systems worked with the commission to understand the laboratory's protocols and identify the chemicals that might produce toxic fumes and vapors. Through this process the company raised concerns about several chemicals that had combustible characteristics.

As a result, LabAire recommended lining all fume hoods with flame-retardant materials to meet current UL and NFPA safety codes. Bernie Chilton, project manager for Walbridge, the general contractor, states, "LabAire was selected to supply the fume hoods and casework based on their ability to understand the customer's applications and deliver on schedule."



Polypropylene surfaces were chosen for durability against harsh chemical exposure, corrosion and impact.



An open design in most of the facility enables researchers to collaborate across disciplines.

SPACE FOR COLLABORATION

LabAire proposed an open laboratory design for most of the facility to enable researchers to collaborate in a cross-disciplinary manner. Several smaller rooms were also equipped with custom fume hood solutions for specialty procedures requiring isolation.

Polypropylene was chosen for its durability to withstand harsh chemical exposure and corrosion and to resist impact. The investment provided long-term value by eliminating the need to replace metal or wood equivalents that could rust, corrode and deteriorate.

“LabAire was selected to supply the fume hoods and casework based on their ability to understand the customer's applications and deliver on schedule.”

BERNIE CHILTON

The 250 pieces of casework were fabricated from Vycom half-inch white stress-relieved polypropylene. Its all-polypropylene construction included hinges, fasteners and adjusting hardware for maximum chemical resistance.

Much of the casework was selected from standard sizes, but several custom-designed modules for special use were created. Fully recessed door and drawer pulls created a streamlined aesthetic for the laboratory. Cabinets

Flomatic welcomes Ray Smith as new sales rep

Flomatic Valves announced the hiring of Raymond “Ray” Smith II as its new inside technical salesperson. He will assist with product development, write quotation proposals, work closely with distributors, and assist sales representatives. Smith comes to Flomatic with many years of experience as a purchasing manager and sales representative for the plumbing and water systems industry.



Raymond
“Ray” Smith II

De Nora launches visual assistance platform

De Nora announced the launch of a visual assistance platform for remote customer support. DE NORA VIA will allow De Nora to assist their customers with live video support and inspections. The platform allows De Nora personnel to see what the customer sees so issues can be resolved immediately, without travel, reducing travel costs and delays that could increase customer downtime.

Nipper named new CEO of Ørsted

Mads Nipper accepted an offer to become CEO of the energy company Ørsted and will step down as CEO of Grundfos at the end of 2020. The Grundfos board, led by Jens Moberg, has started the search for its new CEO.

Centrisys/CNP announces two promotions

Centrisys/CNP promoted Josh Gable to director of sales and Brett Bevers to regional sales manager. Gable was most recently regional sales manager for Centrisys, and Bevers was most recently an application engineer with the company. In his new role, Gable will focus on identifying areas for growth and advancements, establishing streamlined processes and training regional sales managers. Bevers will focus on collaboration between engineering and customer teams, installation pilot testing, and prospect engagement and education.



Josh Gable



Brett Bevers

Endress+Hauser offers My Tech Support Portal

Endress+Hauser’s My Tech Support Portal offers customers 24/7 access to a growing knowledge base on the company’s instrumentation and applications, along with the ability to create and manage support and service cases online. My Tech Support provides immediate access to articles on diagnostics and troubleshooting, and on product and application know-how, such as service operations.

requiring transparent chemical storage were equipped with clear polycarbonate panels in the doors. Work surfaces and counter tops were fabricated from epoxy resin, an especially inert material with high chemical and corrosion resistance.

LabAire provided a combination of 14 standard and custom-sized fume hoods specific for each laboratory protocol. Each fume hood was fabricated with a custom, flame-retardant liner to meet the FM4910 flammability standard.

A combination of variable-air-volume and constant-air-volume fume hoods in the main laboratory were supplied in 6- or 8-foot widths. The smaller procedure rooms were equipped with 4-foot-wide fume hoods, and a custom 12-foot fume hood was designed to accommodate a sequential process in the washing room.

NFPA-compliant flammable storage cabinets for chemicals were provided in several locations. In addition to the cabinets, several polypropylene mobile work carts were provided.

Matt Madeksza named president and CEO of Veolia North America

Veolia North America announced that Matt Madeksza was named president and CEO. In his new role, Madeksza will be responsible for overseeing a company that serves approximately 4,000 industrial and municipal customers across the U.S. and Canada. Madeksza replaces interim President and CEO Brian Clarke, whose years of VNA experience helped effectively guide the company through challenges posed by the COVID-19 pandemic.



Matt
Madeksza

Liquid Environmental acquires FloHawks Plumbing + Septic

Liquid Environmental Solutions announced that the company has acquired the assets of FloHawks Plumbing + Septic that serves the Pacific Northwest. Terms of the transaction were not disclosed. FloHawks, based in Puyallup, Washington, will continue to operate under the FloHawks name. FloHawks customers include owners of sewer systems, septic systems and grease traps/interceptors that must be serviced regularly to prevent sewer spills and to protect the public wastewater collections system.

Mfg. Chemical names Joe Dymecki director of sales

Mfg. Chemical announced the hiring of Joe Dymecki as director of sales. Before joining Mfg. Chemical, he served as vice president of sales for Dubois Chemicals, and previously led Selig Industries and Zep Inc. as vice president of sales and vice president business effectiveness, respectively.



Joe Dymecki

ResinTech opens new plant and global HQ

ResinTech has moved into its new global headquarters in Camden, New Jersey. The \$138.8 million development project includes 353,000 square feet of new construction on a 27-acre campus. Sized to produce up to 1 million cubic feet of strong acid cation resin a year, the plant can be expanded to meet the demands of the growing market. The company also moved its Aries Filterworks division, makers of point-of-use filters and lab water systems, to the same complex.

Grundfos breaks ground on new center

Grundfos announced the groundbreaking of its Americas Regional Center, located in Brookshire, Texas. The 45,000-square-foot facility is expected to be completed during the spring of 2021. Grundfos is currently seeking to achieve LEED Platinum certification. The new offices will house company sales, operations, engineering, HR, finance and other support functions. **tpo**

MEETING THE CHALLENGES

The architect for the project was Long & Associates. To meet the laboratory’s specialty needs, LabAire worked with the commission staff to understand their challenges. That led to the recommendation for polypropylene casework, accessories and fume hoods to provide years of reliable, corrosion-resistant service.

Stephen Ward, of the Steve Ward and Associates installation contracting firm, notes, “LabAire shared and exemplified our principles of forward thinking, planned execution, and effective communication through all project phases, helping to get the project done on time and on budget.”

ABOUT THE AUTHOR

Kevin R. Murphy (kmurphy@labairesystems.com) is national sales manager for LabAire Systems, a manufacturer of fume hoods, casework and other containment solutions for highly corrosive environments. **tpo**



Federal Screen Products Vessel Internals

Federal Screen custom fabricates extremely strong and durable vessel internals using high-quality wedge wire screen for the most demanding water applications. Wedge wire offers a continuous-slot design, which increases open area for better collection and is highly resistant to clogging and extreme pressure and temperature variances. The combination of a unique internal support-rod structure and the flexibility in the materials available to be used in fabrication makes wedge wire a great choice when constructing an under-drain system. Internals are designed to provide even flow distribution throughout to avoid channeling and are available in multiple configurations. Screen laterals and pipe-based screen laterals can be connected to distributor and drain headers by custom bolt patterns, standard NPT threads, fabricated or ANSI flanges or welded as one assembly. Federal Screen specializes in inlet distributors, air scour assemblies, header systems, hub assemblies and support assemblies as well as other custom designs.

905-677-4171;

www.federalscreen.com



Puck Enterprises Boom Truck lead pump

Puck Enterprises's Boom Truck lead pump is manufactured for supreme flexibility and reach, allowing better, easier access to tanks and

product spotlight

wastewater

Visual assistance platform enables remote customer support

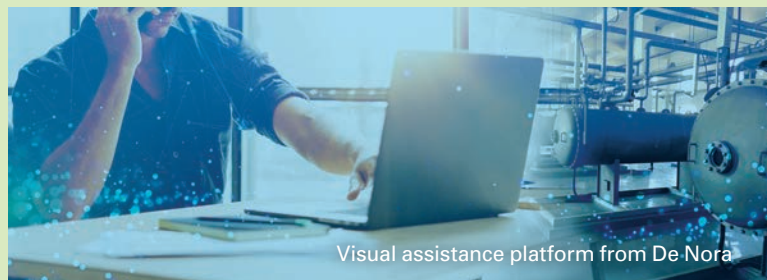
By Craig Mandli

The COVID-19 pandemic has made travel around the country difficult. But wastewater treatment equipment still needs maintenance, and considering the complicated technology many facilities employ, manufacturers have had to adjust the manner in which they service and provide technical support.

De Nora recently launched a **visual assistance platform – VIA** – that allows the company to assist their customers with live video support and inspections.

“The solution doesn’t rely on a customer having a particular skillset or special equipment; a tablet or smartphone is all that’s needed to connect with a De Nora product expert to assist with troubleshooting or making a repair,” says Ben Gilles, Director of Digital Transformation with De Nora. “The platform allows the technicians that would otherwise travel on site to see exactly what the customer sees so issues can be resolved immediately, without travel, reducing travel costs and delays that could increase customer downtime.”

Customers are supported by expert engineers and product experts remotely from their facility. Visual assistance optimizes the communications process, enables more accurate and faster resolutions, and ensures higher customer satisfaction. Through live rich communications via a tablet or smartphone, De Nora experts will use a variety of tools including voice, text, document share, augmented reality and artificial intelligence to guide customers on site through servicing, troubleshooting and startup.



Visual assistance platform from De Nora

“We understand that not every VIA call will result in instant issue resolution, and that sometimes a site visit will be needed,” says Gilles. “When an on-site call is necessary to resolve an issue, VIA ensures that the on-site technician is well prepared and ready with a solution when they arrive.”

The advantage of this particular solution is that it can be applied across all infrastructure, as it’s not limited to particular technologies or industries. Because municipal wastewater treatment is a vital service, the implications of equipment interruptions are enormous, including public health and safety of the community, as well as plant personnel. So, according to Gilles, this technology is especially valuable in the wastewater treatment industry.

“Remote visual assistance can be used for setup and installation of new facilities, provides faster response times for emergency incidents, and minimizes time on site, which is a crucial benefit in current times,” he says. “Using remote technology such as VIA supports preventive maintenance, too, because service engineers can advise operators remotely on how they can extend optimal operation at the plant.”

281-240-6770; www.denora.com

lagoons. It’s equipped with a CAT 13B DRPTO engine that can achieve maximum power at 577 hp. This translates to a 3,200-plus gpm pump capacity. Engine control and monitoring with Puck’s LightSpeed control system software is also available. The truck’s boom utilizes Puck’s suite of hydraulic and electric control systems to ensure that the boom can be placed exactly where it needs to go. The wirelessly controlled boom boasts a 70-foot reach, which is supported by four large outriggers.

712-653-3045; www.puck.com



Val-Matic check valves

Val-Matic’s check valve applications range from potable water to abrasive slurries and corrosive chemicals, with a wide range of metallurgies, seating materials and accessories. The importance of slam-

ming characteristics, headloss and maintenance needs are features that have been taken into consideration when engineering and designing the check valves. The valves are highly engineered to provide long life and trouble-free performance. All Val-Matic check valves are certified NSF/ANSI 61 for drinking water and NSF/ANSI 372 lead-free.

630-941-7600; www.valmatic.com

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product spotlight

water

Analyzer suite keeps eye on important parameters

By Craig Mandli

Managing water in any industry requires risk mitigation, compliance, safety, and process uptime. **EZ Series Online Analyzers** from **Hach** provide a solution for continuously monitoring parameters that are critical to these concerns.

The analyzers include the parameters, numerous measurement ranges and constant data that enable operators to make faster decisions. All instruments come in the same rugged mainframe with a compact footprint and a common user interface on industrial panel PCs, keeping training efforts low. They are designed to let operators detect trends and identify potential issues before they become problems.

The suite of analyzers measures parameters such as ATP, toxicity, VFA/TAC and trace metals, along with organics, inorganics and nutrients. Whether for drinking water, wastewater or industrial applications, a wide range of treatment processes can be optimized. They offer flexibility, with a variety of measuring ranges, multi-stream capabilities (up to eight channels), and multiple parameter options. Automatic calibration and validation allows users to be confident in the accuracy of their analysis, or a self-collected sample or standard can be introduced via the grab-sample port.

With EZ Series technology, operators can improve process control, avoid downtime, and ensure compliance with 24/7 data availability. Administrator access and activated/deactivated menu keys provide customizable access levels for data security, and a variety of analog and digital communication outputs support easy integration into systems.

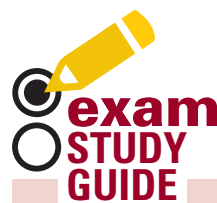
“Reliable monitoring of remote locations or unmanned plants allows staff to focus on other tasks,” says Monique Lanphear, senior demand generation marketing manager at Hach. “All EZ Series analyzers share spare parts, thus requiring less inventory, while a common user interface reduces training efforts. Automatic cleaning between samples eliminates cross-contamination. All of this adds up to improved performance in your plant.”

Thanks to the versatile instrument platform, in many cases it is possible to match the online analysis to an established laboratory method, including colorimetry, ion-selective electrode, single- and multi-parameter titration, voltammetry, and chemiluminescence or respirometry.

In order to meet the requirements of the individual application, analyzers can be combined with robust sample preconditioning units for filtration or external dilution. All systems are designed for fully automatic operation and require virtually no intervention. The self-cleaning filtration systems are available for different particle sizes. Their design allows for trouble-free sampling and contributes to high uptimes. **800-227-4224; www.hach.com tpo**



EZ Series Online Analyzers from Hach



Licensing exams can be challenging. Our **Exam Study Guide** helps you prepare by presenting questions similar to those on an actual exam. You can find many more sample questions on the *TPO* website at www.tpomag.com/study.

WASTEWATER

By Rick Lallish

While performing the daily walk-through at an aerated lagoon treatment plant, you notice surface bubbling throughout the primary lagoon, except in one area. In this area, the surface is calm and uninterrupted. What is the most probable problem?

- A. Blue-green algae has taken over the lagoon
- B. Diffuser is plugged or fouled
- C. Filamentous bacteria have begun to take over
- D. Riprap has failed in this area

ANSWER: B. Visual inspections are very important in any type of treatment facility. In a lagoon system using aeration, the surface turbulence will tell the operator many things about the plant's performance. A calm area over a diffuser usually means the diffuser is plugged or fouled. Heavy surface turbulence or a geyser of water usually indicates a broken diffuser. Troubleshooting a plant is very important part of an operator's daily duties. More information may be found in the *Office of Water Programs, Operation of Wastewater Treatment Plants*, Volume 1, 8th edition, Chapter 8.

DRINKING WATER

By Drew Hoelscher

How do you calculate the running annual maximum residual disinfectant level (MRDL) average for chlorine?

- A. Average the highest distribution system chlorine residuals from each month for 12 months
- B. Average the lowest distribution system chlorine residuals from each month for 12 months
- C. Average the highest and lowest distribution system chlorine residuals from each month for 12 months.
- D. Average the four most recent quarterly distribution system chlorine residual averages.

ANSWER: D. MRDL is a running annual average that is computed quarterly. The first step is to average the chlorine residuals reported during the monthly bacteriological sampling period. The monthly averages for the quarter are then averaged so that a current running annual average can be computed by averaging the four most recent quarters. The MRDL for chlorine is 4.0 mg/L.

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

By Craig Mandli

Finnish wastewater treatment plant gets quick reduction in operating costs

Problem

The wastewater treatment plant in Turku, Finland, processes wastewater from the region's industries and almost 300,000 residents. "The acquisition of new dewatering systems became a hot topic when we renewed our sludge treatment contract in 2018," says Jouko Tuomi, process engineer. "We decided to launch a tendering procedure to replace our machines with modern decanters and thus achieve maximum dryness."



Solution

The city purchased two **decanter centrifuges** from **Flottweg**.

RESULT:

"In two years we have saved sludge costs of over \$170,000 per year because the dry matter content has increased by about 5%," Tuomi says. "At the same time, we have saved polymer costs of about \$18,000 per year and energy costs of about \$3,500 per year. We have recouped the purchase costs of a machine within just one year." 859-448-2331; www.flottweg.net

Blower solutions helps water recycling facility operate more efficiently

Problem

A Midwest clean-water plant needed to reduce power consumption and looked at replacing its 125 hp multistage blowers. The new blowers would operate on a constant-pressure control loop as they would also be used to run an airlift. The plant also hoped to reduce heat in the blower room, which became uncomfortable in summer.

Solution

The plant team chose an **Inovair IM20 blower** to directly replace the old units, minimizing installation cost. The top discharge and small footprint allowed the unit to be installed on the existing pad with minimal piping modification. The direct-drive, high-efficiency unit needed only 75 hp to meet the design flow 1,350 scfm at 7.5 psig. The Inovair-designed control system optimized operation and reduced power consumption by another 7%.



RESULT:

The plant saw a 47% reduction in power usage and lowered the blower room temperature by more than 25 degrees F while staying significantly under budget. 855-466-8247; www.inovair.com

Pump eliminates monthly maintenance and downtime

Problem

The rendering floor of a meat production facility generated harsh conditions for pumping, including highly acidic wastewater and abrasive and aggressive solid byproducts from production of chicken, beef and pork. The company's pumping system used a flap-check valve that regularly failed after passing solids, requiring monthly maintenance and costly downtime.



Solution

Plant management chose a dual-purpose **pump** from the **Pioneer Pump Vortex Series**, combining the efficiency of a self-priming pump with the solids-handling ability of a chopper pump. Using a recessed impeller, about 15% of the solids meet the face of the impeller. This, along with a vacuum-assisted priming chamber, allows the pump to move solids and fluids efficiently. A ball check valve prevents clogging from solids and handles abrasive debris effectively. A vacuum-assisted priming chamber keeps the pump from running dry.

RESULT:

The pump met the demands of the rendering plant floor; the facility later invested in two more Vortex Series pumps. 503-266-4115; www.pioneerpump.com

Integrated offering achieves high recovery and low discharge rates

Problem

An expanding Midwest food and beverage plant outgrew its previous water treatment system. The reverse osmosis and clean-in-place systems were 10 years old and built for smaller demand. The controls and analytics were antiquated and required significant manual operation.

Solution

Kurita America developed an **integrated solution**. The plant purchased larger RO and CIP systems with more sophisticated automation. To maximize recovery, city water was fed to a softener and polisher before moving to a single carbon filter that provided chlorine destruction without consumable chemicals. The RO was placed downstream of the carbon filter. RO permeate was used for boiler makeup and plant process water. A larger portion of permeate was fed to two storage tanks along with sodium hypochlorite for disinfection. The RO concentrate was sent to the cooling towers as makeup water, reducing use of city water and discharge to the sewer.

RESULT:

The solution is saving 144,400 gallons of water per year. The RO system reached 87% permeate recovery. A U.S. Water system reclaims a portion of brine during softener regeneration, reducing salt usage and chloride discharge and mitigating compliance concerns. 866-663-7633; www.kuritaamerica.com

Maximum ozone transfer sought for groundwater project

Problem

The Pure Water Monterey Groundwater Replenishment Project (Monterey Pure) sought to replenish a local aquifer by converting secondary wastewater into a pure reclaim water. Once the process was chosen (side-stream injection + pipeline flash reactor + static mixer), Mazzei Injector Co. conducted an in-depth analysis to see whether that design could provide more than 90% ozone transfer at all operating conditions at full-scale, or at least achieve the transfer provided by the high-pressure PFR used in the pilot. It was clear that there was a discrepancy.



Solution

Using multiphase computational fluid dynamics modeling, **Mazzei Injector** did analyses to optimize the design and proposed replacing the single PFR with two shorter-length **PFRs**, creating two lower-dosage dissolution zones and reducing localized gas saturation and dissolved ozone residuals. Multiple sidestream injectors at separate PFRs would give operators wide flexibility in operating the ozone dissolution system. They could adjust ozone transfer efficiency and the energy cost of gas injection choosing the number of sidestream injectors used.

RESULT:

Ozone pilot plants often use gas contacting conditions that cannot be economically scaled up, especially in water reuse projects, which often require a high transferred ozone dosage to optimize the performance of advanced wastewater treatment processes. **661-363-6500; www.mazzei.net**

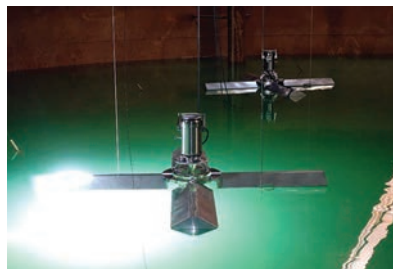
THM removal system helps city reach EPA regulations

Problem

The 16 mgd San Luis Obispo (California) Water Treatment Plant receives water from three reservoirs, leading to varying levels of organic material in the feedwater. Primary disinfection is with ozone and secondary disinfection with free chlorine, which can lead to disinfection byproducts such as trihalomethanes. As water age increases, THM formation progresses. Operators closely monitor the THM average against the U.S. EPA violation level of 80 ppb. In 2014 and 2015, the city experienced THM levels that caused concern.

Solution

Engineers and city staff concluded that aeration for THM mitigation would be viable. They installed the equipment in a 2 million-gallon clear well tank with short detention times. The **PAX TRS system** from **PSI Water Technologies** was comprised of seven 15 hp surface aerators, a 12,000 cfm Powervent headspace ventilation unit, and a PAX PWM-500 tank mixer. The system was validated in May of 2020.



RESULT:

The system exceeded the designed 40% THM removal and reached over 50% removal. "As a result, we have a much greater degree of THM control in our water system," says Jason Meeks, water treatment supervisor. **888-774-4536; www.4psi.net tpo**



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Reuse, Recovery and Energy Management

By Craig Mandli

Automation/Optimization

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InGenius control panels from AdEdge Water Technologies are custom-engineered programmable logic control panels designed to meet site specifications for monitoring and integrating treatment systems with auxiliary equipment and controls for water systems. The panels integrate the process in one place for safety, monitoring, ease of service and installation. They are NEMA 1-4, 4X, 12 and 13 certified, and constructed from thermoplastic, stainless steel, painted steel and fiberglass. They have a hand on/off selector, backwash indicator, LED lamps, security key latch and probe-mounted displays for flow, pH, chlorine, TDS and turbidity. They include level and relay controls, auxiliary power supplies, power converter (110- to 24-volt or 12-volt and AC to DC), surge protection, Ethernet networking, audible/visual alarm indicators and a SCADA interface. **866-823-3343; www.adedgetech.com**



InGenius control panels from AdEdge Water Technologies



Control panels and alarms from Delta Treatment Systems

DELTA TREATMENT SYSTEMS CONTROL PANELS AND ALARMS

Delta Treatment Systems' control panels and alarms are easy to install and operate, and they provide intelligent monitoring and alarm functions for residential, commercial and industrial wastewater treatment systems. Panels are available in several models engineered for

use with advanced wastewater treatment systems and custom package plants. All panels can be supplied with UL and/or Canadian UL 508A listings upon request, and customized control panels are available. The CP20/40/50 Series monitors air pumps and effluent pumps on the White-water treatment system. The Series CP22 panels monitor the air blower on ECOPOD systems with options for controlling and monitoring UV lights for disinfection after treatment. Series CP8000/9000 control the ECODRIP preengineered disposal systems' headworks filter system and effluent dosing pump using a programmable logic controller for time-dosing drip disposal fields. **800-219-9183; www.deltatreatment.com**

FLOWROX MALIBU

The Flowrox Malibu portal is a combined IIoT online process monitoring, maintenance and analysis tool. The data is collected from sensors on a device, sent to a cloud, processed and shown in the Malibu portal. It is easy for anyone to view and use, because data is presented through

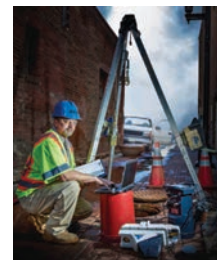


Flowrox Malibu monitoring, maintenance and analysis tool

a 3D model of the actual pump station, filtration process, thickener or other devices. This IIoT online process monitoring portal enables maintenance and analysis of the process. It collects data from smart products in operation and converts it into an easily accessible and visual format. It also functions as an analytics tool. Together Malibu and smart products create Flowrox Digital Services. **410-636-2250; www.flowrox.com**

HACH DATA DELIVERY SYSTEM (DDS)

The Data Delivery System (DDS) from Hach is an efficient flow monitoring service tailored to deliver relevant data when needed. For a fixed monthly fee, it provides all of the equipment, data transmission and technical support needed to acquire flow data — delivered in real time for immediate analysis. It allows operators to know their flow status anytime, anywhere, for either long- or short-term applications. **800-368-2723; www.hach.com**



Data Delivery System (DDS) from Hach

KSB SES SYSTEM

The SES System from KSB can show an operator ways to increase the energy efficiency of pump systems and prolong their service. By recording extensive measurement data, it is possible to evaluate the system operation and identify potential savings and any causes of damage. The operating range can be assessed regardless of the installation type or



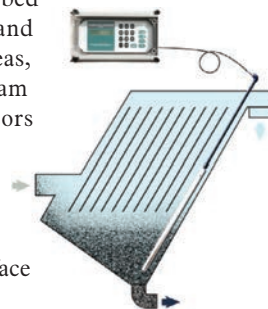
SES System from KSB

manufacturer. It can record process variables and vibration levels through on-site measurements, including pressure, rotational frequency, fluid and bearing temperature, analog signals 0/4-20mA and vibration, performing frequency analyses to identify causes of damage. The report and presentation of findings include an action plan and profitability analysis. **804-222-1818; www.ksbusa.com**

MARKLAND SPECIALTY ENGINEERING AUTOMATIC SLUDGE BLANKET LEVEL DETECTOR

The Automatic Sludge Blanket Level Detector from Markland Specialty Engineering uses high-intensity infrared light that, along with its slim profile, enables it to measure the sludge bed depth even in water/wastewater clarifiers and tanks that have obstructed or constricted areas, such as the inclined plates of lamellas. The beam intensity of the LED-phototransistor sensors automatically adjusts for thick or thin biosolids concentration or even light flocs. This detector allows operators to program desludge pumps to run only when necessary for maintaining the preferred liquid-solids interface level, saving wear and tear on pumps.

It helps maximize water removal and optimize feed density. In dissolved air flotation units, it can adjust surface skimmer speeds to match variations in the thickness of the floating sludge layer. In sequencing batch reactors, it can control the decant valve to minimize cycle times. Calibration is not required. **855-873-7791; www.sludgecontrols.com**



Automatic Sludge Blanket Level Detector from Markland Specialty Engineering

PARK PROCESS POLYCAT

The PolyCat batch-type polymer blending and injection system from Park Process is used for the preparation of liquid polymer to aid in the flocculation of septic tank waste sludge in the dewatering process. The batch tank method allows for the time necessary to uncoil the long-chain polymer molecules, making them more effective in reacting with sludge solid particles. It is used in conjunction with standard solid separation devices, dewatering boxes, centrifuges, belt presses, filter presses and other equipment requiring flocculation to enable dewatering. **855-511-7275; www.parkprocess.com**

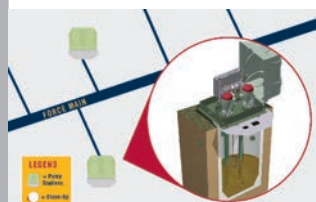


PolyCat polymer blending and injection system from Park Process

SMITH & LOVELESS FORCE MAIN SYNC

Force main pressures vary; and without accounting for the variable conditions, reduced service life and a multitude of other issues arise. These phenomena result in impeller and volute erosion, reduced bearing and seal life, excessive pump noise, and vibration. Force Main Sync

from Smith & Loveless monitors hydraulics in the common force main to keep pumping at the required flow rate. Using a PLC touch-screen human-machine interface, a variable-frequency drive and a force main sensor, it constantly senses force main pressure and automatically adjusts the VFD to maintain a constant flow rate, no matter how many stations are online. **800-898-9122; www.smithandloveless.com**



Force Main Sync system from Smith & Loveless

YSI, A XYLEM BRAND ALYZA

Alyza wet-chemistry analyzers from YSI, a Xylem brand are used for continuous monitoring of orthophosphate or ammonium. They can be used to monitor effluent concentrations for either parameter, but can also directly control particular processes. The PO₄ can control chemical dosing for phosphorus removal, in which dosing rates are automatically adjusted to maintain a desired orthophosphate set point. The NH₄ can be used for ammonia-based aeration control. This control strategy adjusts aeration output based on an ammonium set point and continuous data from the NH₄. The MultiPort mixing valve significantly reduces chemical consumption and maintenance. With the reduction in chemical consumption, nondrip, IV-style chemical bags are used in place of large jugs. They are available in single- or dual-channel versions, and operators can benefit from accurate measurements at low concentrations, extensive onboard diagnostics, automatic calibration and automatic cleaning. **937-767-7241; www.ysi.com**



Alyza analyzers from YSI, a Xylem brand

Biogas

JDV EQUIPMENT DOUBLE MEMBRANE BIOGAS HOLDER

The Double Membrane Biogas Holder from JDV Equipment is easy to install, has low-upfront capital costs and requires low operating capital. Its design allows for variable biogas storage within the inner membrane at constant pressure during gas production and utilization, while

the air-inflated outer membrane provides gas pressure and protection. The outer membrane is constructed of a high-tech, cross-woven fabric that's coated with PVC and UV-ray protection, proven to endure the weather elements. Sensors monitor the volume of gas present, giving operators full control of optimizing the utilization of biogas to feed generators and/or heating systems. Storing digester biogas can eliminate flaming from the digester, and it can help reduce or completely eliminate the need for electric grid power when generators and/or hot-water boilers are incorporated into the facility design. **973-366-6556; www.jdvequipment.com**



Double Membrane Biogas Holder from JDV Equipment

Boilers

HURST BOILER EURO SERIES

The Euro Series from Hurst Boiler has a full wet-back radiant heat transfer area that promotes internal water circulation and rapid heat absorption. Separate rear tube sheets allow each pass of tubes to expand and contract at their own rate without tube-to-sheet stress. Tubes are mechanically rolled, flared and beaded, making any tube service a simple matter. The only refractory in this design is a rear plug, which allows easy access to the furnace for inspection. It is available in eight models from 100 to 2,000 bhp. It is designed for optimum fuel efficiency and has proven in certified tests to meet, and often exceed, the efficiencies of four-pass boilers. There are no refractory baffles to replace or maintain. **229-346-3545; www.hurstboiler.com**

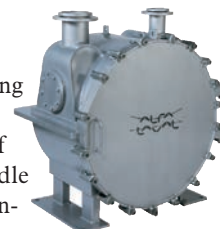


Euro Series from Hurst Boiler

Heat Exchangers/Recovery Systems

ALFA LAVAL WELDED SPIRAL HEAT EXCHANGERS

Controlling temperature and maximizing efficiency of anaerobic digesters is critical for optimal bacteria growth and stabilization of sludge. Alfa Laval spiral heat exchangers handle this tough duty with ease, with a single-channel, low-fouling design that sits in a compact footprint. They can help maximize heat transfer, save space and reduce maintenance. **866-253-2528; www.alfalaval.us**



Spiral heat exchangers from Alfa Laval

High-Efficiency Motors/Pumps/Blowers

BOERGER BIOGAS ROTARY LOBE PUMP

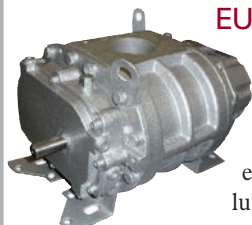
The Boerger Biogas Rotary Lobe Pump offers biogas operators an effective and wear-resistant solution for pumping biogas substrate from renewable resources. Its Premium Profile steel rotor has profiles incorporated into the rotors to ensure that fibers in the pumped medium become part of the short-term wear surface. They attach

themselves in the grooves and are continuously renewed each time the rotor turns. This organic short-term surface provides full protection from wear, and the rotor itself shows virtually no signs of wear even when subjected to long-term exposure. It is constructed using a maintenance-in-place design, which allows for all wetted parts to be replaced without the removal of pipe or drive systems. **612-435-7300; www.boerger.com**



Biogas Rotary Lobe Pump from Boerger

EURUS BLOWER ZZ SERIES



ZZ Series blowers from Eurus Blower

ZZ Series blowers from Eurus Blower are drop-in replacements for competitor blowers. They have heavy-duty cast housings, machined impellers, alloy steel shafts with oversized bearings, hardened/precision machined steel forged gears, oil-lubricated gear and/or grease- or oil-lubricated drive sides, plus keyless locking assemblies for easier timing gear maintenance. The blowers provide up to 15 psig pressure and 2,350 cfm flow. **630-221-8282;**

www.eurusblower.com

VOGELSANG XRIPPER

XRipper grinders from Vogelsang are designed with twin Ripper Rotors, which are one-piece cutting elements that ensure maximum torque is delivered when grinding tough solids. The refined design of the teeth is suitable for shredding wipes, plastics, rags and other troublesome waste. The rotors allow the unit to be easily serviced as compared to other units that feature individual blades and spacers. By loosening just a few bolts, the wet-end of the unit is pulled from the housing and easily serviced. Units can be serviced on site in a matter of hours, as opposed to days. Drop-in replacement units are available for all common pipeline, channel, lift station and hopper-fed applications. **330-296-3820; www.vogelsang.info**



XRipper grinders from Vogelsang

Water/Wastewater Reuse

BIOMICROBICS BIOBARRIER MBR

The complete, optimized design of the BioBarrier MBR system from BioMicrobics simplifies the settling, screening, direct aeration and ultrafiltration of the wastewater treatment process to remove 99.9% of the contaminants. Certified to NSF/ANSI 40 Class 1, NSF/ANSI 245 (nitrogen reduction), and NSF/ANSI 350 standards, this blackwater/graywater treatment system establishes the material, design, construction, and performance requirements for onsite residential and commercial applications. Installed above or below grade in locally sourced tanks, the system offers from 500 to more than 100,000 gpd flows and also meets water-quality requirements for the reduction of chemical and microbiological contaminants for nonpotable water use. The treated wastewater can be used for restricted indoor water use and/or unrestricted outdoor water use. It is a packaged, pre-engineered, scalable, and efficient solution, which enables property owners, regardless of their size, to gain a rapid return on their investment. **800-753-3278; www.biomicrobics.com**



BioBarrier MBR system from BioMicrobics

ORENCO SYSTEMS ADVANTEX AX-MAX

AdvanTex AX-Max wastewater treatment systems from Orenco Systems are containerized, fully plumbed, plug-and-play units sized for larger commercial and municipal applications. Units come in a variety of configurations, measuring up to 42 feet long by 8.5 feet wide. They can be installed singly or in multi-unit arrays, either above ground or buried to grade. They use an attached-growth treatment method to produce clear effluent with significant nutrient reduction, suitable for surface discharge after disinfection or subsurface irrigation or other reuse. One unit can process up to 5,000 gpd of raw sewage or 15,000 gpd of primary-treated effluent. Units reduce nitrogen up to 90%, depending on configuration, and provide reliable performance with only a part-time operator. **800-348-9843; www.orenco.com tpo**



AdvanTex AX-Max wastewater treatment systems from Orenco Systems

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“Treating and distributing drinking water is a significant **responsibility** that takes dedication, training and skill. Our operators welcome the challenges our plant expansion will bring, and I know they'll continue to excel.”

Melissa Kahoun
Aqua Illinois Area Manager
Kankakee and Will Counties
Joseph Donovan Regional Water Treatment Plant, Kankakee, Ill.

Read what **matters** to operators in every issue of TPO.
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worth noting

people/awards

The **Eastern Municipal Water District** in California was recognized as a 2020 Utility of the Future Today for its groundbreaking approach to expanding its recycled water system. **Global Water Resources**, a water resource management company, was also named a Utility of the Future Today.

The Water Environment Federation named its 2020-21 board of trustees, led by **Dr. Lynn Broaddus**, president, also president of Broadview Collaborative. Trustees are:

- **Jackie Jarrell**, past president
- **Jamie Eichenberger**, president-elect
- **Ifetayo Venner**, vice president
- **Keith Hobson**, treasurer
- WEF executive director **Walt Marlowe**, secretary
- Trustees **Rajendra Bhattarai**, **Howard Carter**, **Shellie Chard**, **Gustavo Gallo-Chacon**, **Aimee Killeen** and **John Trofatter**

The **Lewiston Auburn Water Pollution Control Authority** received the Richard B. Goodenow Award from the Maine Water Environment Association.

The **H.L. Mooney Advanced Water Reclamation Facility** in Woodbridge, Virginia, earned a Platinum11 Peak Performance Award from the National Association of Clean Water Agencies.

The **Centralia Wastewater Treatment Plant** received a 2019 Wastewater Treatment Plant Outstanding Performance Award from the Washington Department of Ecology.

Shihong Lin, assistant professor of civil and environmental engineering at Vanderbilt University in Nashville, Tennessee, won the 2020 Paul L. Busch Award from The Water Research Foundation for his leadership in developing innovative water separation techniques.

Tom Farley, chief operator at the Southwest Harbor Wastewater Treatment Facility, received the David Anderson Award for Laboratory Analyst Excellence from the Maine Water Environment Association.

The Parker Water and Sanitation District's **Rueter-Hess Water Purification Facility** in Castle Rock, Colorado, received the Directors Award from the Partnership for Safe Water.

Tyson Foods facilities in New Holland, Pennsylvania, and Robards, Kentucky, received the Clean Water Award from the U.S. Poultry & Egg Association for going above and beyond in sustainable wastewater treatment and water reuse.

The wastewater treatment plant operated and maintained by **Veolia North America** in Cle Elum received a 2019 Outstanding Performance Award from the Washington Department of Ecology.

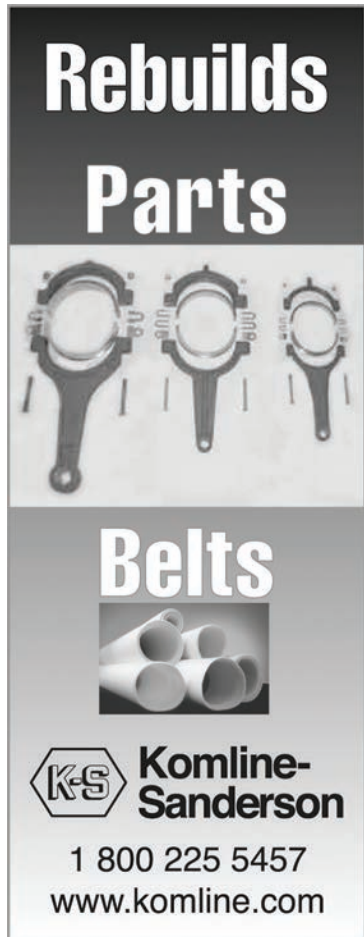
The **City of Pueblo, Colorado**, received the WEF 2020 Project Excellence Award for the first full hydrocyclone/ammonia controlled nutrient removal process in the United States and for improvements to the James DiIorio Water Reclamation Facility.



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KC Water was among 13 public drinking water systems honored for exceptional operations and performance by the Association of Metropolitan Water Agencies.

Michelle Thibideau, village clerk and head of public works in Centerville, received the Wastewater Operations Specialist 2020 award from the Michigan Rural Water Association.

The **Ute Water Conservancy District Treatment Plant** received the 2020 Outstanding Water Treatment Plant Award from the AWWA Rocky Mountain Section.

Yakima was one of eight cities to receive the Gold Award from the Washington Department of Health Office of Drinking Water.

For the second consecutive year, the city of **Vicksburg, Mississippi**, received the Water Treatment Plant of the Year award from the AWWA.

Halton Region became the first municipality in Canada to receive the Directors Award from the Partnership for Safe Water.

Rudolph "Rudy" Chow was named chief operating officer of the U.S. Army Corps of Engineers' Washington Aqueduct and will serve as interim general manager to succeed Thomas Jacobus, who retired in September after more than 25 years.

TPO welcomes your contributions to Worth Noting. To recognize members of your team, please send notices of new hires, promotions, certifications, service milestones or achievements as well as event notices to editor@tpomag.com. tpo

Automatic Sensor Cleaning

Dissolved Oxygen Monitor

Optical Sensor with Q-Blast

The Q-Blast Dissolved Oxygen System provides nearly maintenance free operation by automatically cleaning the sensor using a high pressure air system.

This system is ideal for aeration basin control, resulting in improved process performance and energy savings!

FEATURES

- The Q-Blast Package includes: Monitor, Sensor, and High Pressure Cleaner
- Available with Optical Luminescence or Membraned Sensors
- Factory Assembled for Easy Installation



Q-Blast

Total Chlorine Monitor



Reagent Free Measurement

The Q46/79PR is ideal for controlling chlorine addition in disinfection chamber.

FEATURES

- Submersible or Flowcell Type Sensor
- Optional pH Measurement
- Easy Installation and Low Operating Cost

Sludge Blanket Monitor



Interface Level Analyzer

Continuous sludge level measurement supports effective process control.

FEATURES

- Prevent sludge washout
- Control blanket loss from over-pumping
- Maintain underflow sludge density

Toxic/Combustible Gas XMTR



"Smart Sensor" Technology

Model D12 Gas Transmitters provide the ultimate in application flexibility.

FEATURES

- Interchangeable "Smart Sensors"
- Internal Data-Logger
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