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Superintendent
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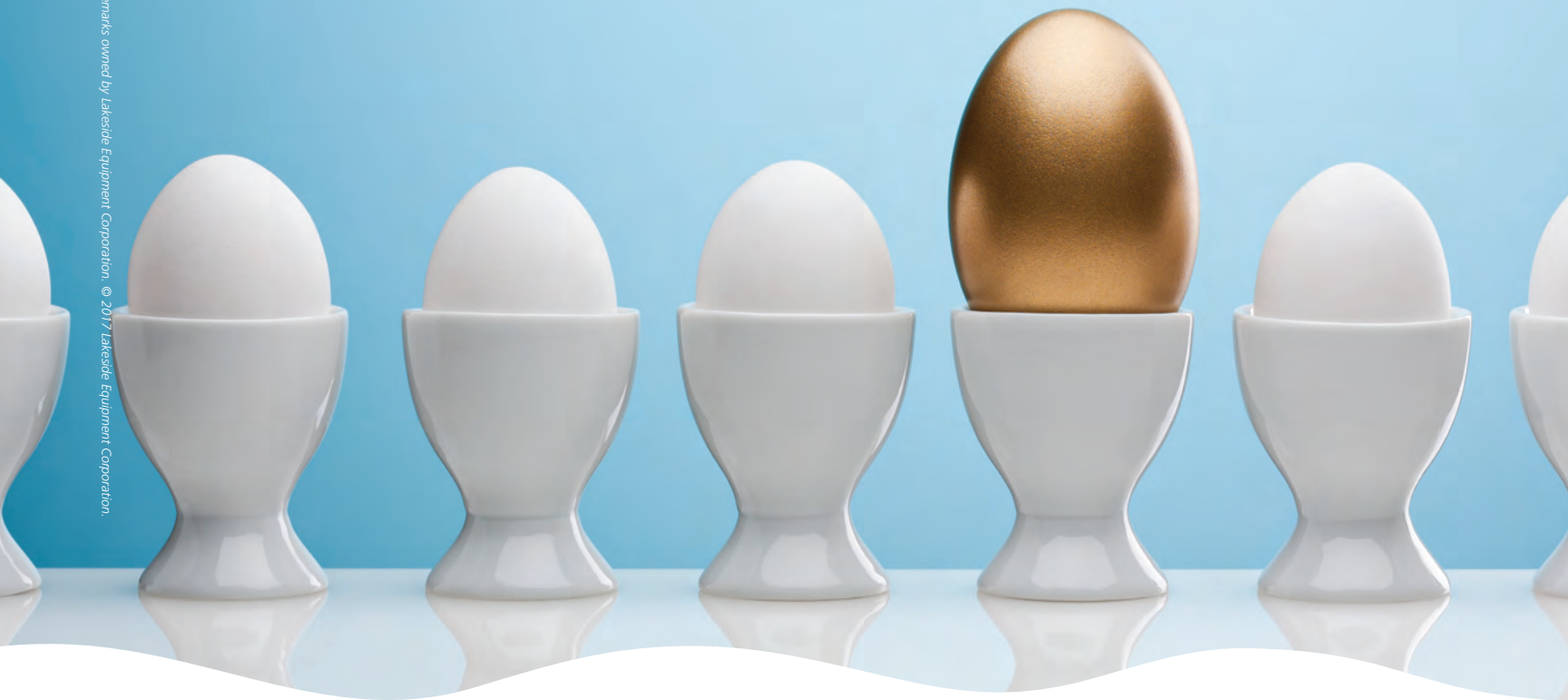
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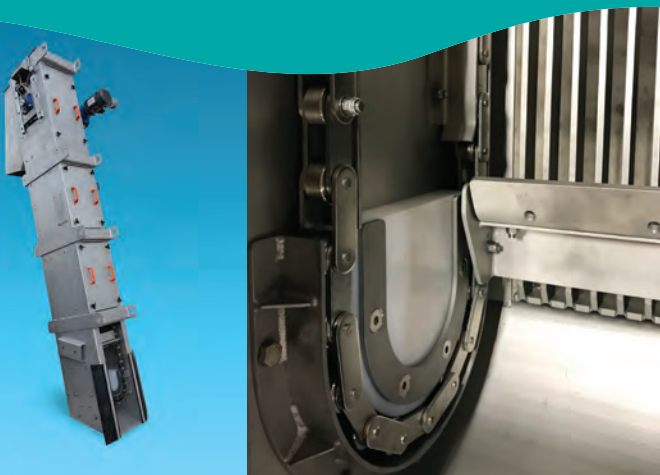
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on the cover

Tony Wood's life made a right-angle turn 25 years ago. He got married and became chief operator of the Osgood (Indiana) Wastewater Treatment Plant. He had no experience in either case, but has been successful at both.

(Photography by Marc Lebryk)

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Hendersonville's water filtration plant has highly advanced processes, but the credit for its quality output belongs to an experienced team of operators.

By David Steinkraus

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'Dumb Kid' No Longer

Tony Wood learned through long and hard experience to become an expert operator, superintendent and grant writer for the clean-water plant in Osgood, Indiana.

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In any profession, it's not pure talent that makes people great. It's seizing that talent and getting the most from it. That starts with genuinely loving one's chosen line of work.

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 - Water Plant: Efficient distribution in Kingsport, Tennessee
 - Wastewater Operator: Brandon Pechin, city of Boise, Idaho
 - Wastewater Operator: Rick Lallish, Southern Illinois University Edwardsville
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- » In My Words: The quest for High-Quality Biosolids
- » PlantScapes: Artwork and open house in Ames, Iowa
- » Hearts and Minds: Exemplary outreach in Concord, New Hampshire
- » Technology Deep Dive: DryLet Aqua Assist for biosolids



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for the New Year.*

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let's be clear

Yagottawanna

IN ANY PROFESSION, IT'S NOT PURE TALENT THAT MAKES PEOPLE GREAT. IT'S SEIZING THAT TALENT AND GETTING THE MOST FROM IT. THAT STARTS WITH GENUINELY LOVING ONE'S CHOSEN LINE OF WORK.

By Ted J. Rulseh, Editor

*“Now some people say that you shouldn't tempt fate,
and for them, I cannot disagree.
But I never learned nothin' from playin' it safe.
I say fate should not tempt me.”*

Mary Chapin Carpenter



I just got back from a short vacation that included a concert by Mary Chapin Carpenter, a favorite of mine. Watching the show and remembering her CDs that I own, I said to myself, “What talent — to write such powerful songs and to sing and play them with such feeling.”

But then — being old enough to know better — I remembered what really makes her great. Where greatness is concerned, talent is just the admission ticket. In any field, succeeding greatly is all about the striving, the endless hours of practice, the failures, the persistence. Or, to paraphrase a quote attributed to various

people: The harder we work, the more talented we get.

IT'S ABOUT LOVE

Any profession — music, art, drama, engineering, water and wastewater treatment — is full of people given bushels of talent who never truly excel. I'm convinced that most often people who stand apart in some endeavor also happen to love it. Where else would the drive come from to put forth all the effort real success requires?

The headline for this column comes from a carved wooden sign I saw posted in a high school orchestra rehearsal room. This was the instructor's daily reminder that the kids who go furthest are the ones who really wanna.

I look at my daughter, now age 35. In grade school and high school, she played the cello so well after a few years that she moved the bow with her entire body, her music so beautiful it could almost make her old man weep. She had the talent but not the love; halfway through high school, she gave it up.

She turned to develop her real love, cooking, at which she's a virtuoso. She grew up in the kitchen, helping her



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mom knead bread from about age three, later working with me to prepare and perfect my homemade honey-crust pizza. Today she's a chef at a private restaurant club and draws raves from customers and co-workers. Her creations keep getting better; I predict, with no trace of bias, that when she opens her own place (and one day she will), people will line up around the block for her soups, salads, pizzas, sandwiches, dinner entrees and desserts.

Where greatness is concerned, talent is just the admission ticket. In any field, succeeding greatly is all about the striving, the endless hours of practice, the failures, the persistence.

The driving force? She has the wanna. Her husband and two boys eat as well as her restaurant patrons. When her family comes to visit us, she cooks our meals, though I tell her over and over that we don't expect it — her visits should not be busman's holidays. Regardless, we get lunches and dinners worthy of a four-star restaurant. Cooking is not just what she does; it's who she is.

FINDING THE PASSION

I look back at my own career. I started college majoring in the sciences — first physics (with some chemistry and math thrown in) and then biology. Along the way, I discovered something: although I did well academically, I would never be a scientist because I did not love (in fact, hated) working in a lab.

What I did love was writing. So, I built a career around writing about scientific and technical subjects. I'll leave aside any claims to being great, but I know I've gone a lot further as a writer than I ever would have as a scientist. It certainly helps that I like getting up in the morning and coming to work.

The water industry seems to bring people around to their passion through a back door. Few grow up wanting to be water or wastewater operators. Many enter the industry simply because they need a job. Soon, they grow to love it and find a calling. Part of that, I'm sure, comes with the realization that cleaning wastewater is part and parcel of creating fishable, swimmable lakes and streams, and that treating drinking water is fundamental to healthy communities.

Love for the career without a doubt drives the dedication that has brought and continues to bring so much progress toward clean and healthy waterways. I leave you with another quotation:

"My mother said to me, 'If you become a soldier, you'll be a general. If you become a monk, you'll end up as the pope.' Instead, I became a painter and wound up as Picasso."

Pablo Picasso

May each of us wind up as our own kind of Picasso. **tpo**

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NEW RESEARCH

Power in Urine

Scientists at the U.S. Army Research Laboratory are observing unexpected results when combining urine with a newly engineered nano-powder based on aluminum. It instantly releases hydrogen from the urine at much higher rate than with ordinary water. The research team announced earlier this summer that its nano-galvanic aluminum-based powder produced pure hydrogen when contacting water or other liquids containing water.

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OVERHEARD ONLINE

"This fatberg is up there with the biggest we've ever seen — it's a total monster and taking a lot of manpower and machinery to remove."

British Utility Discovers 130-Ton FOG Blockage
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CLIMATE STUDY

Water Quality Fears

Increased precipitation from a changing climate could pollute U.S. waterways with excess nitrogen, increasing the likelihood of severe water quality impairment from coast to coast, according to a new study by scientists Eva Sinha and Anna Michalak of the Carnegie Institution for Science and Venkatramani Balaji of Princeton University. The effects will be especially strong in the Midwest and Northeast, the researchers found.

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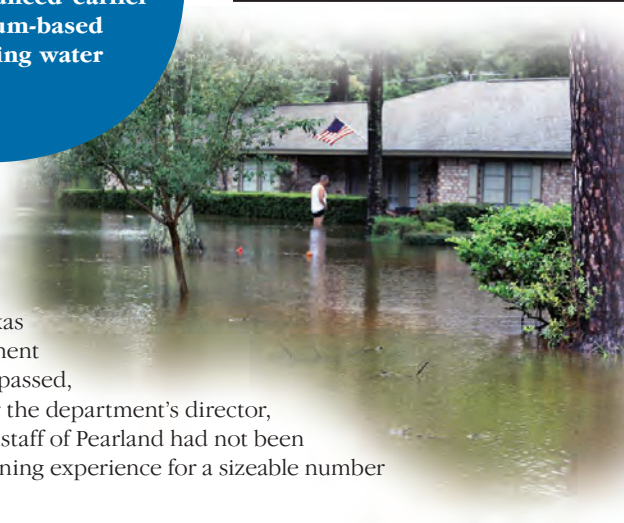


HURRICANE HARVEY

Learning Experience

When Hurricane Harvey hit South Texas Aug. 25, the city of Pearland's Department of Public Works was put to the test. It passed, but not without teaching moments for the department's director, Eric Wilson, and his staff. "A lot of the staff of Pearland had not been through a major event, so it was a learning experience for a sizeable number of city employees," Wilson says.

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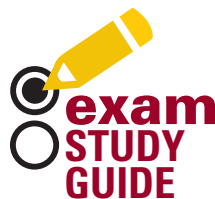
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By Ron Trygar

WASTEWATER

The use of which substance can be very effective for removing soluble organic contaminants if used in conjunction with coagulation, sedimentation, filtration and disinfection?

- A. Potassium permanganate
- B. Anionic polymer
- C. Sodium hydroxide
- D. Activated carbon

ANSWER: D. If used along with other processes — like activated sludge, enhanced primary treatment, filtration and final disinfection — activated carbon can effectively remove soluble organic material from wastewater. Powdered activated carbon (PAC) can be added to the influent where it adsorbs organic contaminants. As it does so, it settles in clarifiers with other solids and is removed. The use of PAC requires a constant feed as a slurry. Be careful: PAC dust can be explosive.

Granular activated carbon, or GAC, can be used in filtering as a layer of media or in a separate contact unit where soluble organic material is adsorbed and removed. As the GAC continues to adsorb organics, it becomes exhausted and measurable COD begins to rise in the effluent. At that point, the GAC can be removed from the filter, dried and regenerated by heating in a furnace. The organic material is released during heating and is destroyed in an afterburner; the GAC can then be reused.

DRINKING WATER

To prevent splashing acid on yourself or the surrounding area when preparing dilutions of acid in a laboratory, the following safety rule of thumb should be followed:

- A. Always pour the dilution water into the concentrated acid solution.
- B. Rapidly add the entire amount of required acid to a small amount of heated dilution water, then top off with cold water.
- C. Add equal amounts of the dilution water and concentrated acid in a separate container simultaneously.
- D. Always pour the acid slowly into the dilution water.

ANSWER: D. Always pour the acid slowly into the dilution water. To avoid harm to yourself and others working in the lab, remember: *Do it like you ought-er, add the acid to the water!* If water is added into a concentrated acid solution, a violent reaction can take place, causing the water and acid to splatter and splash out of the container. When working around lab chemicals, or any chemicals, always wear proper personal protective equipment. This includes acid-proof aprons, chemical-resistant gloves, and eye and face protection.

ABOUT THE AUTHOR

Ron Trygar, a certified environmental trainer, is the senior training specialist for water and wastewater programs at the University of Florida TREEO Center. He has worked in the wastewater industry for more than 30 years in a variety of locations and positions. He holds a Florida Class A wastewater treatment operator license and a Florida Class B drinking water operator license. **tpo**

The Team Makes It *Great*

HENDERSONVILLE'S WATER FILTRATION PLANT HAS HIGHLY ADVANCED PROCESSES, BUT THE CREDIT FOR ITS QUALITY OUTPUT BELONGS TO AN EXPERIENCED TEAM OF OPERATORS

STORY: **David Steinkraus**

PHOTOGRAPHY: **Martin Cherry**



THERE WAS SUPPOSED TO BE A THREE-MONTH WINDOW. IT DIDN'T MATERIALIZE. Instead, the old water filtration plant in Hendersonville, Tennessee, closed at 10:09 a.m., and at the same time, a new one started up 1,000 feet away. It was Aug. 26, during the peak demand season.

"Needless to say it was an interesting day," says John Wunner, water treatment superintendent in Hendersonville, about 18 miles from downtown Nashville. "The new plant was ready to open, but usually plant operators would prefer doing it in winter when demand is lower,"

What opened on that day was one of the most advanced water filtration plants anywhere, certainly the most advanced in Tennessee. It's advanced because Tom Atchley, general manager, and the Board of Commissioners looked at the future of regulations and customer demand. The drought of 2007 played a part, too.

"The drought gave us a chance to rethink where we wanted to go," Wunner says. The city's population increased by 9 percent from 2010 to 2015 (it's 53,500 today), and the real estate market is hot. "We've almost reached the limit for residential development," Wunner says.

BEST TECHNOLOGY

The district faced a choice: refurbish the old 8 mgd conventional filtration plant at a cost of several million dollars or invest in a visionary plant to meet the community's needs for years, comply with stricter regulations in the future, and provide superior water quality.

Erik Baeder, water treatment plant operator, lifts a case of freshly bottled and packaged Hendersonville water. Hendersonville uses the water for events and online sales.

The plant sits beside a flowage of the Cumberland River, source of the city's drinking water. On the way to the Ohio River, the Cumberland River drains about 18,000 square miles in Tennessee and Kentucky, home to 2.5 million people. They worked closely with neighbors, who agreed to accept a new plant on the same site as the old one, which was demolished last summer.

From the outside, the plant looks much like a modern suburban house, but on a larger scale. On the inside, it's more interesting. The intake lies 210 feet offshore in about 17 feet of water. A 36-inch pipe brings water to the plant.

Raw water first reaches the dissolved air flotation cells (Leopold - a Xylem Brand). There is no first-step chlorination, only the addition of 48 percent alum for coagulation. Water flows next to microfiltration membranes (Pall Water) and then to the granular activated carbon beds (Calgon Carbon Corporation) and a UV array (Calgon Carbon Corporation) for polishing. The last step is the addition of residual chlorine for storage and AquaPure 3655, a proprietary blend of orthophosphates and polyphosphates from Brenntag North America, to inhibit corrosion.

Wunner has no trouble declaring his plant the most advanced in Tennessee. "Other municipalities cannot employ the technologies we have because they do not have the money or the resources," he says. Putting these technologies together in this way was the suggestion of the engineering company Water Management. The firm recommended and designed the DAF system that, along with the Pall Water membranes, were costly upfront.

“I have the best job
in the utility district
because of the crew I
have serving with me.”

JOHN WUNNER



Hendersonville (Tennessee) Utility District Water Filtration Plant

BUILT: | 2014

POPULATION SERVED: | 52,000

SERVICE AREA: | 12 square miles

EMPLOYEES: | 10

FLOWS: | 10 mgd design, 5 mgd average

SOURCE WATER: | Cumberland River

SYSTEM STORAGE: | 9.1 million gallons

DISTRIBUTION: | 251.45 miles of water mains

ANNUAL BUDGET: | \$1.5 million (operations)

KEY CHALLENGES: | Staying abreast of EPA regulations, providing best-quality water

WEBSITE: | www.hendutil.net

GPS COORDINATES: | Latitude: 36°17'37.84"N;
Longitude: 86°38'29.99"W



The Hendersonville Utility District team includes, from left, Steven Reppel, Scott Jones, Kenny Bain, Kristofer Stoner, John Wunner, Jason Chalfont, Erik Baeder and David Nanney.



BOTTLED UP

When Hendersonville built its new water filtration plant, it included machinery from Norland International to produce bottled water — not for profit but for two other purposes.

One is to provide publicity for the operation, says John Wunner, plant superintendent. The bottles come out in groups of eight and are shrink-wrapped in packages of 24 for giving to community groups or people taking tours. The bottling takes place behind a large window so tour groups can watch.

The other purpose is to provide water in case of a civil disaster. Hendersonville doesn't have the equipment to supply the entire community in that event, but the operators can deliver 3,500 unlabeled bottles per hour. "That would be for an extreme emergency," Wunner says.

A typical bottling run produces 1,200 to 1,800 bottles per hour. Five to six operators run the equipment as it disinfects, fills, caps and labels the bottles and dates the production run. Bottling is typically done one day each week when everyone is scheduled to work. The bottling equipment runs twice a month.

The equipment cost \$250,000. And because the water is not bottled for resale, it does not fall under rules of the federal Food and Drug Administration.



When the new plant went into operation, it was a \$27 million investment in the future. But it was the commissioners who decided on this course, and they did it to prepare for the future. Consider, Wunner says, that the U.S. Environmental Protection Agency is working on rules about pharmaceuticals in the water supply and on disinfection byproducts. Installing microfiltration is a proactive investment that secures Hendersonville's ability to meet future regulations.

"We can take out everything we're supposed to take out, and as regulations change, we'll be able to remove inorganics or volatiles for years to come," Wunner says. The membranes do most of that work — all of it during the winter months when demand and the organic load are low.

From April to October, the plant uses the activated carbon beds and UV lamps to polish the water coming out of the membranes. The UV lamps are costly to operate, so Wunner is careful with their use. The activated carbon beds are useful for other issues. Like lakes in many parts of the country, the Cumberland River Basin is subject to algae blooms and spikes; and the carbon removes the dirty, earthy odor that algae imparts to water.

Raw water turbidity is not a great problem for the Hendersonville plant, even though it sits on a river. The intake draws from Old Hickory Lake, and it and the plant are situated just above a dam. Most of the flowage lies upstream of the intake, so the flowage acts as a huge settling basin that intercepts much of the sediment washed into the water by rains farther upstream. It is rare that turbidity exceeds 5 or 10 NTU, Wunner says.

The water plant's raw water collection tanks.





John Wunner,
Hendersonville water
treatment plant
superintendent

A GREAT TEAM

A building with advanced equipment is nothing special without quality people to run it. That's why the plant has a wall of fame for operators. On the wall are engraved plaques showing the years of service of each person, copies of their certifications, and awards given to the utility. "I have the best job in the utility district because of the crew I have serving with me," says Wunner, who holds a Grade 4 water treatment operator license. His team includes:

- Jason Chalfont, supervisor and Grade 4 operator
- Michael Burlison, Kenny Bain, Steven Reppel, Erik Baeder and Scott Jones — Grade 4 operators; Charles Stone and David Nanney — Grade 3 operators
- Kristofer Stoner, operator trainee

"Half of the crew members are over 50 and have been with us for more than a decade," Wunner says. "We're fortunate to have longevity because

Steven Reppel performs a pH test on treated water.



sounded like a cool and interesting field to be in, and I could keep my other job," Wunner says.

He started with Hendersonville in 1996 and became superintendent in 2006. He never left his old skills behind. They served him well, he says, because auditing requires looking at systems and people, forming profiles

“We have created a mindset where excellence is not considered above average. We want to keep that culture because it maintains public confidence in us.”

JOHN WUNNER

Grade 4 operators are hard to find and retain. What is even more impressive, we have created a mindset where excellence is not considered above average. We want to keep that culture because it maintains public confidence in us.”

Wunner himself is a testament to the attractions of a water job in Hendersonville. He started working as an auditor in New York and still carries the accent of a native of that city. When he moved to Tennessee, he worked in retail and at Nashville's airport. At age 35, he was open to opportunities and saw an ad for a water treatment operator on the midnight shift. "It

of them, and making informed judgments based on what they're doing and what they will do.

NO PAIN IN RAIN

For most water plants, sitting next to a large river means being wary of rain upstream and the sediments it flushes from the land. "Rain has no effect on us," Wunner says. The plant has been granted a waiver that allows reduced testing frequency for trihalomethanes and haloacetic acids. *(continued)*

The Hendersonville plant draws water from Old Hickory Lake just north of Nashville.



The plant process has another benefit: less sludge. The old plant was sending 12.5 million gallons to a Nashville wastewater treatment facility; the new one produces about 3.5 million gallons — 72 percent less. “You know what that equates to when you get charged by the gallon,” Wunner says.

The plant has public support because Wunner makes a point of cultivating it: “Making the public aware of a finite commodity is the best way to protect it.” The staff gives tours upon request to anyone from children younger than 3 years old and Girl Scout troops to students on high school and college field trips.

“Can I operate the plant from my house? No. Personally, I wouldn’t want to because I’m the type who likes to come out from behind my desk. I like to walk my own facility and see what is happening.”

JOHN WUNNER

STAYING SECURE

Public knowledge also helps keep the water plant secure not just from acts of terrorism, but also from simple acts of mischief that could put the water supply at risk. “In this age, when people want to show off by putting videos of themselves on the internet, there is a fine line between pranks and damage,” Wunner says. “It costs thousands of dollars to clean a storage tank, and to me, that is no longer a prank.”

Plant operators have iPad tablets that allow them to see the status of the system and issue commands, but they don’t work outside the building. “Can I operate the plant from my house? No,” Wunner says. “Personally, I wouldn’t want to because I’m the type who likes to come out from behind my desk. I like to walk my own facility and see what is happening.”

BUILT FOR THE LONG RUN

All the planning and work has given Hendersonville a water plant that will fill the community’s needs for many years and is positioned to meet

almost any standard regulators may impose. The plant is rated for 10 mgd but could be expanded to 12 mgd if the need arises. The district is also building a 1.5-million-gallon storage tank to expand capacity and reduce the number of low-pressure zones. And cross connections would enable the city to draw water from the nearby water utility in case of a drought.

“This water plant is a product and a testament to all of the people in the Hendersonville Utility District who had the vision and foresight to make it happen years before our water resources would begin to cause problems for our customers,” Wunner says. “I have a wonderful crew of operators who make this all happen. Awards are very nice, but they come because of the work of all those people, and I’m just lucky to be a part of it.” **tpo**

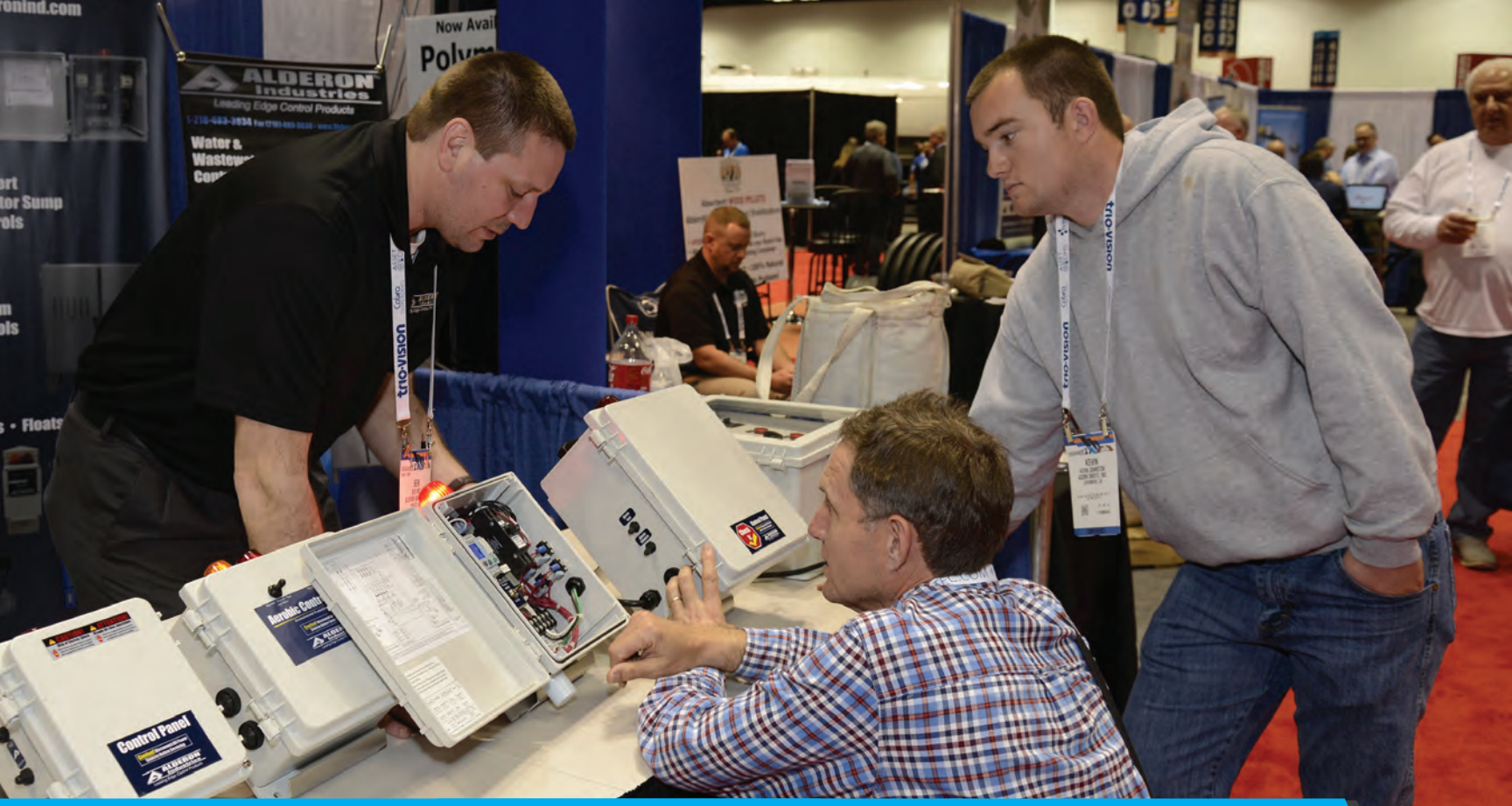
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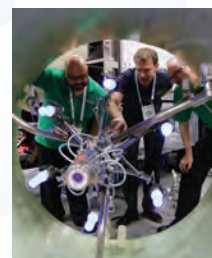
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Molding Water Ambassadors

SEEING, HEARING AND TOUCHING ARE BETTER TEACHERS THAN BOOKS FOR KIDS
IN THE WESTERN VIRGINIA WATER AUTHORITY'S OUTREACH AND EDUCATION PROGRAMS

By Craig Mandli



Students use a probe to test for dissolved oxygen and pH in water samples.

The Carvins Cove Natural Reserve is a small piece of man-made nature in an urban jungle, but its impact is anything but little for the people, plants and animals dependent on its water.

The reserve faces challenges that include flooding, sediment buildup, industrial runoff, endangered species, invasive species, drought and climate change. That's why organizations and communities are working to create a sustainable future for the watershed.

The Western Virginia Water Authority, based in Roanoke, has crafted an intensive water-themed outreach program with Carvins Cove as its centerpiece. Students in third grade and up can tour the authority's water treatment facility and then take a short bus ride to the 3.2-billion-gallon Spring Hollow Reservoir.

It's an opportunity in line with the authority's mission. "We aim to provide education and a conservation ethic to our customer base," says Sarah Baumgardner, public relations manager. "We want to help them understand where their water comes from, and hopefully spark a level of interest in the water cycle."

NATURAL SURROUNDINGS

Students who visit Carvins Cove, a 13,000-acre watershed that includes Spring Hollow Reservoir, can receive water-themed lessons, take a nature hike, and explore aquatic and woodland habitats. The reserve provides the first exposure to the natural environment for many students.

“We can send out messages on conservation and environmental protection until we're blue in the face, but the message comes through more effectively from their own children.”

SARAH BAUMGARDNER

“Almost half of urban Roanoke students have never walked through the woods, explored a creek or seen a large body of water,” Baumgardner says. “A lot of them are scared because their only exposure to the forest has come from a book.”

“We believe that a hands-on nature experience allows students to make a tangible connection between what they learn in school as it applies to the real world,” Baumgardner says. “I believe that without these experiences, students will not grow into adults passionate about natural resources, working in the environmental field, or striving to protect our water and watersheds.”



Tara Poelzing, educator with the Western Virginia Water Authority, helps students collect benthic macroinvertebrates from the creek feeding the Carvins Cove Reservoir.

On Carvins Cove field trips, groups of students rotate between a nature hike and various age-appropriate activities. Third-graders can play a water cycle game and learn lessons on evaporation, condensation, precipitation and water conservation. Older elementary students learn about human impacts on watersheds and water quality, water pollution and best management practices.

More intensive programming for high school and college students includes chemical and probe testing of water quality, biological testing for macroinvertebrates, and a study on the watershed's effect on water quality. An introduction to karst topography models helps students understand groundwater zones, including the water table, zone of saturation and zone of aeration.

Older students can also take a tutorial on the authority's geographical information system, learn to identify water and sewer infrastructure, measure distances, and use PC-based topographical maps. "Our educators are in contact with area schools before each school year to make sure our offerings fit into the curriculum," Baumgardner says. "Many teachers base entire units around our programming."

MEASURED SUCCESS

The authority tracks participants each year, documents new and repeat school and watershed visits, and surveys teachers to gain insights for refining its programs. Since 2006, programming has expanded from 1,800 to more than 13,000 students per year. "Our fall programming typically books up before the end of school in spring," Baumgardner says. "We offer programming year-round, but fall and spring are typically the busiest because it's the best time to get students out to the reserve."



BELOW: Robin Bailey, educator with the Western Virginia Water Authority, teaches students the properties of water during a field trip.

Feedback from students and teachers is typically positive. Students are often amazed by snippets that educators and environmentally savvy visitors find commonplace. "So many are totally surprised when we point out that the state flower, the American dogwood, actually grows on trees they can find in the reserve," Baumgardner says. "They are also astonished to learn the journey their water takes. The treatment process is so complex."

STAYING POWER

The program has lasting effects: Many water authority employees took part in some form of watershed education since its inception in 2004. Several said their involvement helped steer them toward water treatment careers. "Three employees changed their majors after touring our treatment plant and reserve as junior college students," Baumgardner says. "This industry can be difficult to attract people into, so if our programming helps to plant that seed, that's a big deal."

In the shorter term, the students typically pass on what they learn to their parents and other family members. "We can send out messages on conservation and environmental protection until we're blue in the face, but the message comes through more effectively from their own children," Baumgardner says. "We believe students are more willing to protect their water if they know where it comes from. Our goal is to teach these students to be local water ambassadors." **tpo**



Customers tour the 3.2-billion-gallon Spring Hollow Reservoir.

A PRETTY GOOD GIG

AWARD-WINNING WATER QUALITY ANALYST ANDREW JOHNSON THRIVES ON NEW CHALLENGES, OUTPERFORMING PERMIT REQUIREMENTS AND SERVING THE COMMUNITY

STORY: **Trude Witham**
PHOTOGRAPHY: **Brian Adams**

WHEN THE LARGEST WASTE-WATER TREATMENT FACILITY in Alaska switched from chlorine gas disinfection to sodium hypochlorite, Andrew Johnson faced a challenge. He had seven years of wastewater experience, but it didn't include analysis methods for monitoring the hypochlorite system.

"Before I came here in 2008, I worked in an environmental lab," says Johnson, water quality analyst at the John M. Asplund Water Pollution Control Facility. "Most of my experience was transferable to the wastewater job, but when the hypochlorite system went online, I had to learn new test methods. Scott Boettcher, the project manager, said, 'Here's what we need; do it.'"

Johnson rose to the occasion, earning accolades from his boss, Rob Gustafson, water quality section supervisor. In May 2016, based on Gustafson's nomination, Johnson received the Laboratory Analyst of the Year Award from the Alaska Water Wastewater Management Association in the large systems category.

His greatest reward is serving the community, keeping customers happy and meeting the plant's permit: "We achieve higher standards than what is required. The plant has a sterling history." The monthly average final effluent BOD is 158 mg/L (permit 240 mg/L), and TSS is 55 mg/L (permit 170 mg/L).



Andrew Johnson, laboratory analyst with the Anchorage Water & Wastewater Utility's John M. Asplund Water Pollution Control Facility.

HIGHLY TRAINED

Johnson earned a Bachelor of Science degree in animal biology from the University of St. Andrews in Scotland in 1998. After working as a substitute teacher and for the Alaska Department of Fish and Game, he got a job at Northern Testing Laboratories. "They hired me to be a wet chemist and extractionist," he says. "Although I had a little lab experience in college, it wasn't really applicable to a chemistry lab, so I learned mainly on the job."

He found out about the job at the Asplund facility by word-of-mouth. "Several people I worked with at the environmental lab went to work at the wastewater plant and told me about a job there," he says. "So I applied, and my former boss hired me. The person I replaced trained me. That was nine years ago."

He describes his late parents as mentors: "They were great parents who taught me many things that have helped me in my career, like the importance of education, how to treat all types of people with respect, and how to live within my means."

Today, Johnson is one of two main water quality analysts at the plant and is responsible for water quality testing, field sampling and analysis, and septage monitoring. Two backup analysts assist when needed. Tests include total solids, TSS, TDS, total volatile solids, volatile sus-



As one of two main water quality analysts at the plant, Johnson handles water quality testing, field sampling and analysis, and septage monitoring.

“Our permit requires that we test the waters around our point of discharge for coliform and solids to make sure it is not harming the marine environment.”

ANDREW JOHNSON



The Anchorage plant, largest in Alaska, lies in a scenic setting.

Andrew Johnson, John M. Asplund Water Pollution Control Facility, Anchorage, Alaska

POSITION:	Water quality analyst II
EXPERIENCE:	9 years
EDUCATION:	Bachelor's degree in animal biology, University of St. Andrews
AWARDS:	2016 Laboratory Analyst of the Year, large systems category, Alaska Water Wastewater Management Association
GOAL:	Continue serving the water and wastewater needs of Anchorage; be a good steward for the environment and community
GPS COORDINATES:	Latitude: 61°11'47.63"N; Longitude: 150° 1'26.41"W

Among Johnson's accomplishments was learning the testing methods required for the plant's new sodium hypochlorite disinfection system.

“The nicest thing about this lab versus the environmental lab is that here your job is to meet permit, not make money.”

ANDREW JOHNSON

pending solids, and BOD and ammonia for influent and effluent.

He also handles most of the permit analysis for the 2.5 mgd Eagle River and 0.6 mgd Girdwood secondary and tertiary wastewater treatment plants. The state-certified lab must run a blind test to retain certification. Johnson says, “They send a sample, and we analyze it. They say, ‘You got it right and can do it for another year.’”

ALASKA'S LARGEST

The 58 mgd Asplund plant is one of the few in the nation that operates under a U.S. EPA permit issued under Section 301(h) of the Clean Water Act. This allows discharge at primary treatment standards requiring 30 percent BOD and TSS removal. That is possible because of the extreme high tides and natural water flow of Cook Inlet, combined with 80 percent suspended solids removal (well above permit requirements) and chlorination. To continue under the permit, the utility maintains an extensive marine monitoring program.

Built in 1972, the plant serves 125 square miles of metropolitan Anchorage and treats an average of 26.7 mgd for a population of 300,000. It has been upgraded several times, most recently in the late 2000s. Influent goes through screening and grit removal and then to six 1-million-gallon clarifiers. The sludge is sent to thickeners and a belt press, and the dewatered solids are inciner-



ated. The clarified water is sent to the hypochlorite disinfection system (Electrolytic Technologies) and discharged to Cook Inlet.

The plant has 20 employees; 15 operators work two shifts — eight days on and six days off — handling most of the maintenance. The utility has its own electricians and painters.

ALWAYS LEARNING

Johnson enjoys learning new skills. When the hypochlorite system came online in 2016, Johnson had to learn the test methods, which included specific gravity, sodium chlorate, sodium bisulfite, sodium sulfate, hardness, silica and excess caustic. He had three months to prepare for the analyses and learn to do them using “shake-and-bake chemistry.”

He explains, “I purchased the Hach DR 5000 spectrophotometer and a long list of reagents — two to three per analysis,” he says. “I read the directions and followed the standards. It took me about three weeks to get up to speed, but it was nice to learn something new.” He has since trained other analysts and some of the operators, who now perform the hypochlorite strength analysis.

He describes the sodium hypochlorite system as “one of a kind and complicated.” In the late 1990s, the utility decided to move away from chlorine gas for safety reasons. The chlorine cylinders were barged in and then transported by truck through downtown and some residential areas. Plant security and process safety issues were also a factor.

The utility chose the Klorigen hypochlorite generation system from Electrolytic Technologies, which custom-designed the technology. The hybrid system uses an ion-selective membrane process that splits salt so that chlorine gas is produced on one side of the membrane and caustic on the other. A portion of the generated chlorine

gas is sent to the point of application and the remainder to a hypochlorite conversion skid.

PROTECTING THE INLET

“Our permit requires that we test the waters around our point of discharge for coliform and solids to make sure it is not harming the marine environment,” says Johnson. “So once a year, we hire a contractor for two days to sample from a boat in Cook Inlet.” For five to six hours, samples are collected where the effluent pipe enters the ocean, first as the tide goes out, and again as the tide comes in.

“Sometimes, depending on hold times and tidal conditions, the contractor will deliver the samples to us at a beach near the plant, but most are delivered to the plant by car,” Johnson says. “We get about 40 samples for two days.” Johnson and analysts Sherri Trask and Paul Smith perform the analyses. The most probable number samples are incubated for two days, and then positive samples are transferred to a different media and incubated in a water bath for 24 hours.

JOB SATISFACTION

Helping to protect the inlet fits Johnson’s goal of serving the community: “The nicest thing about this lab versus the environmental lab is that here your job is to meet permit, not make money. It’s not the most challenging from a lab/chemistry side, but then the whole utility is under the radar. People turn on the tap and the water comes out.”

“I could move up ... but would more likely become an operator since there is greater opportunity in that field. I have a lot of respect for operators, and they do some pretty cool stuff.”

ANDREW JOHNSON

FORMER ROCK ‘N’ ROLLER

When Andrew Johnson leaves the John M. Asplund Water Pollution Control Facility at the end of the day, he enjoys spending time with his wife, Sonya, and sons Duncan (13) and Alex (12). He also has some unique hobbies.

“I’ve been playing disc golf for about 10 years,” he says. “We have a world-class course in Anchorage called Kincaid where I mainly play with a friend I’ve known since second grade. Sometimes, my sons come with me, and I usually bring my dog.” Johnson plays once or twice a week when there is no snow, and he competes in the state tournament about every other year, usually finishing in the top third.

He enjoys visiting the family’s log cabin on a small lake that his dad built in 1982. On Memorial Day weekend, they drive four hours to Homer and take a half-hour boat ride to a beach on Kachemak Bay. There, his family and up to 30 friends pitch tents, rock climb and throw horseshoes. In early fall, the family heads north to a remote area for a few days to pick wild blueberries. In September, they rent a U.S. Forest Service cabin accessible by water taxi. “It is a very beautiful, secluded space where we can watch whales and sea otters frolic in the cove,” Johnson says.

An accomplished guitarist, Johnson played in rock bands years ago: “The main one was a four-piece band that performed in the early ‘90s in Anchorage- and Seattle-area clubs; I did that for two years. But nowadays, I just play for the dog.”

“I have a lot of freedom. I can set my own schedule as to when I am in the lab or out in the field. I work with good people, and when I go home, I don’t think, ‘Oh God, what a day!’ It’s a pretty good gig.”

Johnson gives lab tours to school groups: “The kids visit the stinky stuff in the plant first and then come to the lab. I talk them through some of the analyses and discuss the importance of water quality and treatment.”

As for his next assignment, Johnson is leaving his options open: “I could move up to a management position but would more likely become an operator since there is greater opportunity in that field. I have a lot of respect for operators, and they do some pretty cool stuff.” Either way, he plans to stay with the utility for a long time. **tpo**

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Jeff Ballou (center), water distribution operator from WaterTalent, with Menlo Park (California) Municipal Water District team members (from left) Pam Lowe, senior civil engineer; Brian Henry, Public Works superintendent; Azela Mitch, P.E., city engineer; and Luis Olivera Jr., water system supervisor.

Quality Pinch Hitter

A TEMPORARY SUPERVISOR HELPS A CALIFORNIA WATER DISTRICT THROUGH A STAFFING TRANSITION AND IN THE BARGAIN ADDS VALUABLE INSIGHTS ON SYSTEM OPERATIONS AND FUTURE PLANNING

By Ted J. Rulseh

Everything was running smoothly at the Menlo Park (California) Municipal Water District. Then, the chief operator and water system supervisor left for a new job.

The three weeks' notice he gave wasn't enough for the district to go through its normal hiring process and bring someone new on board; the leadership faced the prospect of a staffing shortage lasting several months.

To solve the problem, the district in September 2016 issued a request for proposals for a temporary water system supervisor. In the end, the district contracted with WaterTalent for the temporary assistance it needed. Jeff Ballou, a retired water operator from a nearby city, led the Menlo Park team for 3 1/2 months, keeping the operation on track while contributing to the district master plan, mentoring staff members, and adding insights to the capital improvement project plan.

Meanwhile, the district had time to conduct a thorough recruiting, screening and hiring process, ultimately selecting Luis Olivera Jr. as water system supervisor. He came with an extensive industry background, most recently working nine years for the city of Modesto Water Services Division.

"Jeff was great to work with," observes Brian Henry, superintendent of Public Works. "His vast knowledge, his commitment to the field and his pas-

“Jeff was great to work with. His vast knowledge, his commitment to the field and his passion for the industry were contagious among our other operators.”

BRIAN HENRY

sion for the industry were contagious among our other operators. Working with Jeff was definitely a positive experience.”

RECRUITING CHALLENGE

The Menlo Park district provides water to about 16,000 customers through 4,300 service connections throughout Silicon Valley, including Facebook's ever-expanding campus. The district purchases its water from the San Francisco Public Utilities Commission. The distribution system has three pressure zones, one with a pump station and two storage tanks totaling 5 million gallons and two operating on demand, relying on the San Francisco Public Utilities Commission storage and system pressure.

“Things went well with the Menlo Park staff. ... They were absolutely supportive, they worked hard, and it couldn't have worked out a whole lot better.”

JEFF BALLOU

In hiring a replacement for its water system supervisor, the district faced a scarcity of qualified candidates in its vicinity. Henry notes, “We're in a unique situation where the price to buy or rent a home is pretty high, and there aren't a lot of people in the area with the certifications we need who are looking for a job.”

Operating short-handed would have had consequences: “Our response time to any type of complaint would have been delayed. We also have a lot of development going on, and simple things like marking out utilities so that construction could move forward would have been delayed.”

Three private businesses and one water district responded to the district's RFP. After a thorough vetting process, Menlo Park chose WaterTalent, a company that provides qualified, licensed interim water and wastewater operators to support utilities that need specialty expertise during staff transitions.

WELL QUALIFIED

WaterTalent offered Ballou, who recently retired after a 36-year career with the city of Pleasanton where he served the last 15 years as chief utilities system operator. “After reviewing Jeff's resume and interviewing him, we thought he would be a good fit not only for his career expertise, but for his attitude,” Henry says.

At Pleasanton, Ballou oversaw well water treatment and a distribution system with 20 reservoirs, 400 miles of water main and some 20,000 service connections. He was also responsible for the wastewater and stormwater collections systems. In early October 2016, he came aboard at Menlo Park and assumed leadership of the water system team, which includes Eric Dorliac, water system operator II, and Dimitri Katsaros, water quality specialist.

“Jeff ran the day-to-day operations of our water department,” Henry says. “He issued work orders to the staff. He was available around the clock for any water emergency. He reviewed all the plans for our upcoming capital improvement projects involving installation of new waterlines. He also reviewed a handful of development plans to make sure we had the proper water infrastructure to serve the developments.”

In addition, he provided significant insight into the updating of the district's standard details book, which specifies design standards that ensure uniformity in how water system infrastructure is installed.

FORWARD LOOKING

Ballou adds, “Menlo Park asked me from my outsider's perspective to observe how they were doing things and recommend based on my experience where they could make improvements. In addition, they were working on a water master plan, which they allowed me to review and offer my feedback.”

Ballou also reviewed the district's plans to expand its staff to accommodate continued growth. “Jeff was crucial in identifying our potential new positions and helping us map out a new organization chart for the water department,” Henry says. Since then, the City Council has approved the new positions of senior water system operator and water system operator I.

“Another of Jeff's contributions was the mentorship he provided to our operators,” Henry says. “I remember many times Jeff coming back after long days in the field and telling how he showed our team members how to resolve an issue and how to deal with it moving forward if it should ever bubble up again.”

MUTUAL BENEFITS

Henry found WaterTalent easy to work with from the beginning: “It was a very smooth process. The staff was always easy to get a hold of when there

were issues or questions. They were available and ready to assist at any time. It was rewarding to be able to bring in someone with Jeff's vast experience while WaterTalent handled the details.”

Ballou also found the experience satisfying. He hadn't considered coming out of retirement until a WaterTalent recruiter contacted him. “The more I thought about it, the more it sounded intriguing,” he recalls. “I'm really glad I did it. It was a great experience in that it got my brain re-engaged and kept me thinking about the things I accomplished in my career.”

“I wasn't used to the on-demand part of the system because in Pleasanton we had storage in all our zones, but I had enough experience to pick it up and run with it. Things went well with the Menlo Park staff. They definitely respected the knowledge I brought to the table. They were absolutely supportive, they worked hard, and it couldn't have worked out a whole lot better.” **tpo**



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“We’re not going to let things get so far behind that we have to chase our tails fixing them. We stay on top of it the best we can. They’re just a good bunch of guys.”

RICK BAILEY

Aaron Boston (left) and Kyle O'Bryan do light cleaning and inspection of the UV disinfection system (UltraTech Systems).

PLAIN OLD EXPERIENCE AND DILIGENCE KEEP TREATMENT PERFORMANCE CONSISTENTLY ON TRACK FOR THE CLEAN-WATER PLANT TEAM IN MARSHALL, MISSOURI

STORY: **Ted J. Rulseh**
PHOTOGRAPHY: **David Owens**

Nothing *Fancy*

AS A TEENAGER WORKING AT THE MARSHALL Southeast Wastewater Treatment Plant, Rick Bailey got a lesson about quality work.

“My boss was Harold McDaniels,” he recalls. “He told us to go out and mow around the gate and the fence row. When we were done, he came back and said, ‘I thought I told you to mow.’ I said, ‘Well, we did.’ He said, ‘It doesn’t look very good to me. Go do it again.’”

“After the third time we did it, he said, ‘From now on, when I tell you to mow, that’s what I want it to look like.’ He just kept sending us back until we got it right. That’s where I got the message about doing things right the first time.”

That simple lesson has guided Bailey for 43 years, his last seven as chief operator at the plant in Marshall, a community of 13,500 in central Missouri. He and his team have made it pay off in excellent permit compliance and in recognitions that include Missouri Water Environment Association Treatment Plant of the Year awards in 1996 and 2016.

Bailey gives credit not to sophisticated technology or exotic practices, but to ordinary attention to detail, from diligent equipment maintenance to basic housekeeping — and yes, that includes keeping the grounds manicured: mowed, weeded and weed wacked.

YEARS OF CHANGE

The Marshall Southeast plant, owned by Marshall Municipal Utilities, was completed in 1972 to replace two small trickling filter plants. It had three raw sewage pumps, an aerated grit removal system, two primary clarifiers, two trickling filters, two final clarifiers and two lagoons totaling 7 acres. Bio-solids were dewatered with two coil filters (Komline-Sanderson).

That plant treated about 1.5 mgd of domestic sewage, but a growing hog kill plant eventually sent it from 2 mgd to as much as 3 mgd of pretreated but still high-strength wastewater. That put stress on the primary clarifiers and the coil filters. In response, in 1988 the utility added a primary and secondary clarifier as well as a third coil filter and an additional sludge holding basin, and built a new office and lab.



Richard “Rick” Bailey, chief operator and lab technician



The Marshall Southeast Wastewater Treatment Plant received the 2016 Missouri Water Environment Association Treatment Plant of the Year award.

Marshall Southeast Wastewater Treatment Plant, Marshall, Missouri



BUILT: | 1972 (upgraded 1988, 1993, 2014)

EMPLOYEES: | 6

FLOWS: | 7.09 mgd design, 2.73 mgd average

POPULATION SERVED: | 13,500

TREATMENT LEVEL: | Secondary

TREATMENT PROCESS: | Activated sludge

BIOSOLIDS: | Class B lime stabilized, land-applied

RECEIVING STREAM: | Salt Fork Creek

ANNUAL BUDGET: | \$2 million (operations, including lift stations)

WEBSITE: | www.mmumo.net

GPS COORDINATES: | Latitude: 39°6'17.42"N; longitude: 93°9'36.75"W

“We have about twice the plant we need. So, we just cut it in half. We run one aeration basin, do maintenance on the other in summertime, and alternate them every year.”

RICK BAILEY

Marshall Southeast Wastewater Treatment Plant PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT
BOD	250 mg/L	5 mg/L	June-Sept.: Monthly avg. 10 mg/L Oct.-May: Monthly avg. 15 mg/L
TSS	150 mg/L	3 mg/L	Monthly avg. 30 mg/L

When that failed to resolve the issues, the utility abandoned the trickling filters in favor of an activated sludge process. That upgrade, completed in 1993, added two 3.5-million-gallon, peanut-shaped aeration basins (Schreiber); three new, 1-million-gallon final clarifiers; and a 9-million-gallon flow equalization basin. The old final clarifiers were converted to sludge holding basins, the lagoons were closed, and cascade aeration was added before effluent discharge to Salt Fork Creek.

The upgrade boosted design capacity to 7.09 mgd, enough to handle the hog kill plant wastewater and accommodate new industries. However, less than a year later, the hog kill plant was converted to a meat packaging operation and its daily flow declined to about 50,000 gpd. Total Marshall Southeast plant flow now averages 2.73 mgd. “We have about twice the plant we need,” Bailey says. “So, we just cut it in half. We run one aeration basin, do maintenance on the other in summertime, and alternate them every year.”

Another upgrade completed in 2014 replaced the original raw sewage pumps with three ABS submersible pumps for dry-weather flows and three more for peak flow (all Sulzer Pumps Solutions). In addition, a new headworks facility was built with bar screens (Duperon Corporation) and a PISTA grit system (Smith & Loveless). A UV disinfection system (Ultra-Tech Systems) was also installed, and a new maintenance shop was completed last summer.

Bailey believes in a team that works together, sets goals, and stays on top of housekeeping and maintenance.

EVEN KEEL

Bailey and his team oversee operations within the plant fence line; a separate department handles the wastewater lift stations, collection lines and water mains. That team is working steadily to reduce sewer system inflow & infiltration. Two factors help keep the plant running smoothly: the 40-plus years' experience of Bailey and colleague John Heilman, who runs the lab, and the consistency of influent from a community where the population and industrial base have remained mostly static.

"I started part time in 1974, and John started full time in 1975," Bailey says. "Between the two of us, we know how this plant functions. I've been here so long that I can go look at the aeration basin and just about tell what I need to be doing. I can look at the color and how much foam is on top. If it looks dark and greasy, it's probably getting a little old and we need to waste some."

"It's just good practices; I don't look at it as doing anything special. We basically operate off our settle-ometer test. We run that on a daily basis, and that's a pretty good indicator. It tells us how well the sludge is settling and whether we need to waste or not." The flow equalization basin helps handle wet-weather flows, which have gone as high as 22 mgd as recently as last summer.

Aeration operates on a feedback loop based on the dissolved oxygen level as measured by inline probes (WTW, a Xylem brand). The influent pumps are automatically flow-paced.

As for industry, the main contributors are the meat packaging plant, an egg processor, and a producer of packaged dinners and other foods. "The industries work well with us; we've never had any real problem with them," Bailey says. "If I need them to do something, I pick up the phone and call them, and they take care of it. If they need help, we respond. The fact we have the capacity to handle more volume makes it easy on us."

The biosolids side also runs with minimal hitches. Material at about 2 percent solids is dosed with polymer, dewatered on a belt press (Rex) and fed to a pug mill where it is mixed with lime. The resulting Class B product



at about 20 percent solids is stockpiled for application to cropland in spring and fall; 2016 production totaled 430 dry tons. The plant staff handles site permitting and recordkeeping; they use two trucks to haul the material to the farms and spread it with beater bars. The plant earned the Missouri Water Environment Association Biosolids Management Award in 2003 and 2009.

(continued)

“I’ve been here so long that I can go look at the aeration basin and just about tell what I need to be doing.”

RICK BAILEY

COHESIVE TEAM

Besides Bailey and Heilman, the plant team includes Nolan Townsend (Class A license), Eric Perkins (Class B), and Aaron Boston and Kyle O’Bryan (both Class C). Ginny Ismay, environmental director for 21 years, retired last summer.

“I assure my team members that if we all work together, set goals, and keep the place looking nice, we’re going to be successful,” Bailey says. “We’re not going to let things get so far behind that we have to chase our tails fixing them. We stay on top of it the best we can. They’re just a good bunch of guys. I told them when we hired them that they would be doing anything from cleaning basins to weed eating to painting to tearing apart pumps. They do a wide range of things, and they don’t complain about any of it.”

Housekeeping gets a top priority: “One of my previous bosses liked to say, ‘Just because it’s a sewer plant doesn’t mean it has to look like one.’ So, we keep the grounds all mowed and trimmed and everything painted and cleaned up.” Maintenance is also performed religiously; that starts with choosing equipment with a record for durability and ease of maintenance.

“On our bar screens, the greasing is minimal,” Bailey says. “We keep bearings in stock for the belt press so we can change those out, and we grease them once a month. We change the oil in the blowers (Aerzen USA) about every six months — spring and fall.” Safety also gets ample attention; last summer, the plant reached seven years without a lost time injury.

Meanwhile, the in-house lab accommodates testing for BOD, TSS, ammonia, fecal coliform, pH, and dissolved oxygen for compliance and process control purposes. Contract labs test monthly sludge samples and run tests for priority pollutants, whole-effluent toxicity, oil, and grease.

TRANSITION LOOMING

Plant leadership is about to change, as Bailey and Heilman plan to retire by year’s end. Both have worked with Townsend, Bailey’s successor, to help smooth the transition. Meanwhile, permit requirements are changing. The plant now monitors for phosphorus, but Bailey expects a permit limit within the next five years. That might require a switch from mechanical aerators to floor-mounted fine-bubble diffusers.

“We may also have to add some type of mixers, possibly section the basins off, do some oxic and anoxic zones for phosphorus removal, and probably do chemical feed along with it,” Bailey says. “At this point, we’re preparing for all that. We’ve got four or five years left to pay off our last upgrade project. I hope that by the time we get the design work done for the next phase of work, we’ll be within a couple of years of paying that off.”

In short, Bailey says, “Just keep rolling.” **tpo**

A CAR, A CAREER

As a 16-year-old in Marshall, Missouri, Rick Bailey had his eye on a 1967 Pontiac GTO. There was just one problem: He had no money.

“My grandfather was general manager of Marshall Municipal Utilities,” Bailey recalls. “He told me, ‘Go down and talk to the wastewater superintendent. He’ll hire you for summer help.’”

“I worked there a couple of summers doing maintenance, painting and mowing. The second year, I started doing some lab testing. I worked about 30 hours a week, weekends and after school.”

He ended up getting the car and, in the bargain, a career. “When I graduated from high school, they said, ‘If you want to stay, we’ll keep you on.’ I told them I would until I found something better, and here I am, still here.”

He worked in the lab for about 30 years and was promoted to chief operator in 2010. There were always enough challenges to hold his interest,

not the least being adjustment to the activated sludge process after years of trickling filter operation. His current role gave him new insights and challenges as a manager and team leader.

Bailey plans to retire at the end of 2017, freeing time to enjoy his hobbies, which include golf, bowhunting and trout fishing.



Rick Bailey, left, chief operator, plans to retire soon after a fulfilling career. Nolan Townsend is in line as his replacement.

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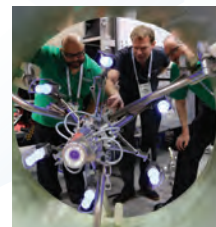
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The solar power system is located next to the treatment plant and was built under a power purchase agreement.

Smart Solar

A NEW MEXICO TOWN ARRANGES TO RECEIVE A MAJOR SUPPLY OF RENEWABLE ENERGY WITH NO UPFRONT INVESTMENT AND NO RESPONSIBILITY FOR SYSTEM OPERATIONS

By Steve Lund

The solar power system at the Silver City Wastewater Treatment Plant is not exactly what town officials first envisioned. For one thing, it's a lot less complicated.

A private company, Affordable Solar, owns and operates the solar panels, produces the electricity and connects to the Power New Mexico grid. The town is just a customer with an agreement to purchase the power generated. "Our only responsibility now is to purchase power," says Alex Brown, town manager. The town buys the power at what Brown considers a favorable rate that is locked in for 20 years.

The treatment plant, with a design capacity of 3.2 mgd and an average daily flow of 1.4 mgd, serves a population of about 11,500. It uses an activated sludge process and UV disinfection. The plant's electric bill used to be \$280,000 a year. In the first year of solar array operation, the bill dropped 27 percent, to \$204,000. Considering expected price increases, the town expects to save \$2 million to \$4 million on electricity during the 20-year agreement.

STIMULUS FUNDING

The town assisted in financing the project by issuing industrial revenue bonds, but basically the savings come with no investment by Silver City in

new infrastructure or new equipment. The story began during the Obama administration with the government stimulus program known as the American Recovery and Reinvestment Act, or ARRA. The town got a grant, with Grant County, to open an Office of Sustainability that's tasked with finding ways to save money on energy.

The ARRA was passed in February 2009, and the Silver City Office of Sustainability was founded in May 2010. One of its first projects was weatherizing homes; eventually, more than 700 homes were made more energy efficient. Another early program was changing the lighting in various government buildings.

Before long, the office identified the wastewater treatment plant and the water system as targets for energy conservation. "We ended up looking at the wastewater treatment plant because it had larger consumption throughout the day," Brown says. "We identified it as an opportunity for a solar array to replace the power that was used during the day."

WISE NEGOTIATION

The town put out a request for proposals and was working toward purchasing a solar array. As part of that process, it applied to Power New Mexico

for a Renewable Energy Credit, or REC. Because Silver City was among the first to apply, it got a favorable REC of 12 cents per kWh sold to the utility.

Silver City was on the path toward buying and operating a solar array and was negotiating with a large energy company when town officials saw an

“We realized that it would be a lot cheaper for the town and the private entity if we went into an agreement where the company actually purchased, built and operated the solar array and we would just buy the power we needed from them during the day.”

ALEX BROWN

opportunity to accomplish the same goal in a different way. Legislation passed by the state in 2011 enabled the town to enter into a power purchase agreement, or PPA, with a third party that would own and operate the solar array.

“We realized that it would be a lot cheaper for the town and the private entity if we went into an agreement where the company actually purchased, built and operated the solar array and we would just buy the power we needed from them during the day,” Brown says.

The negotiations took about three years. Eventually, the company that Silver City first worked with to build the solar array dropped out, but Affordable Solar, which had been a subcontractor, stepped in and agreed to design, build, own and operate the solar plant. The array, occupying 6 acres next to the treatment plant, is rated at 1.14 MW and contains 4,675 solar panels. The PPA was a first for Affordable Solar, but the company has since entered into other similar agreements.

MORE TO COME

The success of the solar project has the Office of Sustainability looking at other applications for solar power. It has already put a 7.6 kW solar array on the roof of the carport of the visitor center. The Silver City Sustainability Plan 2030 lists more renewable energy production projects, which include adding more solar power to municipal buildings.

The wastewater plant is also involved in a long-term project for a regional water system.

Robert Esqueda, utilities director, says the plant’s effluent is used for irrigation by a local landowner

and the municipal golf course. The rest travels down an arroyo until it is absorbed into the ground.

“We did a project where we demonstrated that the water is actually making it back into the aquifer,” Esqueda says. That enabled the town to get recharge credits, which conveyed rights to pump more water out of the aquifer. The town has applied to use the recharge credits near the Grant County Airport to help support a planned regional water system. **tpo**

The solar array occupies 6 acres and is rated at 1.14 MW. It contains 4,675 solar panels.

What’s Your Story?

TPO welcomes news about environmental improvements at your facility for the Sustainable Operations column. Send your ideas to editor@tpomag.com or call 877/953-3301.



ProSeries-M Metering Pumps Offer Precision Chemical Injection

Treating water and wastewater requires aggressive chemicals, which can cause compatibility issues with pump materials and increase the need for pump maintenance. That's where treatment plants can benefit from ProSeries-M metering pumps, well suited to pumping a broad range of chemicals with extreme precision.

Pump tubes are offered in a wide spectrum of materials to accommodate different treatment needs. The operator simply changes the unit's pump tube assembly to the appropriate material for the chemical to be injected. This permits standardization to a single pump model for several chemical applications.

ProSeries-M pumps also feature smooth, quiet, low-velocity injection, which is easy on piping systems. There is no need for pulsation dampeners or expensive piping systems. The gentle squeezing action of the valveless peristaltic pump head design results in near-continuous injection of chemical.

PRECISION CHEMICAL FEED UNDER HIGH PRESSURE

ProSeries-M M-3 units are equipped with Blue-White's innovative multitube technology for precision metering and long service life. Even at high pressures, the advanced multitubes are engineered and designed to provide precision feed into critical treatment systems. At the same time, the design delivers tube life up to four times greater than conventional single-tube designs, helping to reduce costs related to pump maintenance labor and parts.

The multitube designs feature clampless, overmolded tube fittings with permanently printed model numbers, clearly visible through the pump head cover, even while the pump is running. This enables quick and convenient parts ordering.

Flex-A-Prene, Flex-A-Thane and Flex-A-Chem multitubes retrofit to ProSeries-M models

M-2 and M-3. The clampless, overmolded tube fitting is available with multiple connection fitting types, including: 1/2-inch MNPT, barb fitting and 3/8-inch tube compression, tri-clamp, and quick disconnect.

TUBE FAILURE DETECTION FOR AUTO SHUT-OFF

Another benefit exclusive to Blue-White metering pumps is a Tube Failure Detection (TFD) system, which detects a wide range of conductive chemicals with no false triggering. If the TFD senses tube failure, the pump automatically shuts off and energizes a relay or switch. This permits communication with external equipment like backup pumps or alarms. It's simple, efficient and built-in to every ProSeries-M pump.



The ProSeries-M M-3 metering pump has feed rates from 0.0002 to 33.3 gph (0.0007 to 126 lph) with a maximum pressure rating of 125 psig/8.6 bar (pump only).

The M-3 has a 10,000:1 turndown ratio with high-resolution motor speed, along with 4-20mA, 0-10 volts DC and pulse inputs for remote external or batch control and 0-30 volts DC contact closure remote start/stop. Meanwhile, one relay rated at 3A 250 volts and three 15-volt 1A contact closures are assignable to monitor various pump functions, including TFD, optional flow verification sensor, revolution counter, remote/local, forward/reverse, input signals, output signals, motor-on, motor-fault, operating mode setting and more. The units are NSF 61, NEMA 4X, IP66, CE, and ETL listed.

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Efficient Screenings Removal With Lakeside's Raptor Multi-Rake Bar Screen

Operators are excited about Lakeside's new Raptor Multi-Rake Bar Screen, which offers high performance, low maintenance and rapid removal of solids. Manufactured in the U.S. to Lakeside's design and quality standards, this screen is ideal for wastewater treatment plants, pump stations and combined sewer systems to effectively prevent the harmful effects of inorganic solids to downstream equipment.

SCREEN OPERATION

When wastewater flows through the screen, solids are captured on the face of the screen bars. As debris collects and blinding occurs, the upstream water level rises to a high level set point, which then activates the drive mechanism to start a cleaning cycle.

Multiple rakes, attached to dual stainless steel roller chains, provide rapid debris removal from the bar screen. Drainage occurs while material is transported up the screen and dead plate.

Located near the top of the machine, a scraper assembly wipes the debris from the rake head and into a discharge chute. Material falls from the chute into a conveyor, washer compactor or dumpster for disposal.

HIGH HYDRAULIC CAPACITY, LOW HEADLOSS

The heavy-duty design of the Raptor Multi-Rake Bar Screen provides durability and long life in the most severe conditions. With multiple rakes cleaning the screen and rake teeth penetrating the bar openings, captured material is removed rapidly and efficiently in all applications with a high screenings load.

DESIGN AND CONSTRUCTION

The Raptor is engineered using all stainless steel materials to resist corrosion for optimum performance. There is minimal headroom needed above the operating floor, and it features rectangular or trapezoidal screen bars with 3/16-inch minimum bar spacing.

Other features include replaceable rake teeth; maintenance-free lower chain guide or optional lower sprocket assembly; automatic reversing feature; removable stainless steel covers for odor control; optional hinged support to pivot screen out of the channel; and optional explosion-proof design or weather protection system.

APPLICATIONS

Operators and consulting engineers agree that the Lakeside Raptor Multi-Rake Bar Screen provides superior performance in continuous cleaning and removal of inorganic solids in municipal and industrial wastewater treatment plants, pump stations, surface water intake structures and combined sewer overflows.



Cleaner Water for a Brighter Future®

Lakeside Equipment Corporation is an engineering and manufacturing company dedicated to improving the water quality. The company started in the spring of 1928 to engineer, develop and provide water purification systems to municipalities and companies throughout North America. For more information on the design and performance of Lakeside's Raptor Multi-Rake Bar Screen: **630/837-5640 • sales@lakeside-equipment.com • www.lakeside-equipment.com**

Rechargeable Technology Revolutionizes Liquid Level Data Loggers

For applications from CSO monitoring to well drawdown tests, liquid level data loggers have proven valuable. In recent years, several low-cost versions have emerged, designed to enable more cost-effective monitoring. However, these devices have technological shortcomings that limit their lifespan and increase overall system cost.

Traditionally, low-cost level loggers were powered by internal lithium batteries with lifespan potentially limited to five years, depending upon the logging rate. Once the battery is depleted, most of the devices are rendered ineffective because the battery is not replaceable. Although some are powered from the surface after the battery's expiration, the application versatility is significantly limited.

Additionally, older rechargeable battery technologies are not suitable for use in devices requiring long-term deployment, as older rechargeable batteries slowly self-discharge even when a device is not drawing power.

POWER CELLS WITHOUT LIMITATIONS

New technologies promise to alleviate these shortcomings and make the devices more attractive. Accumulator power cells — a new rechargeable technology — are now used to make low-cost data loggers with indefinite lifespans. These new accumulator power cells do not self-discharge.

The power cell is charged via USB connection during data retrieval at a rate of 100 mAh. An AC power adapter also is provided to facilitate faster charging of the power cell at a rate of 800 mAh. With a fully charged battery, the device can operate up to three years, depending upon logging rates.

AUTONOMOUS DATA COLLECTION WITH RECHARGEABLE APPEAL

The DCX-ECO by Keller uses accumulator power cell technology to provide a rechargeable autonomous liquid level logger. It is also available in

absolute, sealed and vented versions. The vented gauge format uses a vent tube integral to the signal cable, allowing the device to compensate for changes in atmospheric pressure in real time. This negates the need for a data logging barometer, which is necessary for reporting accurate data compensating for changes in atmospheric pressure when using an absolute level logger. The sealed and vented versions also allow for communication with the device without removing it from the water.



Keller America specializes in pressure measurement solutions, offering a complete line of pressure transmitters, gauges and loggers. For more information on how the DCX-ECO can provide accurate and reliable data logging: **877/253-5537 • sales@kelleramerica.com • www.kelleramerica.com**

Kohler's Industrial Generators Ensure Prime Performance

In 2016, Kohler unveiled an all-new range of large diesel industrial generators. The company's KD Series includes generator sets in nodes between 800 and 3250 kW, which are powered by an entirely new line of G-Drive engines. The new line will eventually grow to encompass generators as large as 4000 kW.

The generators are available globally under the Kohler and Kohler-SDMO brands and are designed to deliver durability and reliability in various emergency and prime applications. Targeted industries include data centers, health care, water treatment, oil and gas, telecommunications, mining, and more.

"This is an exciting and transformational product," says Tom Cromwell, group president of power for Kohler. "After a very collaborative and thorough worldwide development process, we're very pleased with this new line of generators. The KD Series offers beneficial cost savings and unrivaled performance to our customers around the globe."

OPTIMAL PERFORMANCE

The KD Series large diesel industrial generators offer cost savings because the line delivers excellent fuel consumption at more nodes between 800 and 3250 kW. The generators are designed to meet global emissions regulations and are highly customizable to match an end user's specific requirements. Multiple options are available to ensure optimal performance for the most demanding applications.

Products are designed for high ambient temperature conditions. Thanks to high technology regulation and monitoring control systems on each component, the KD Series offers a very high power quality and best transient response in compliance with the most stringent regulation standards.

"These generators are powered by our new state-of-the-art G-Drive engines, which were developed to provide outstanding power density and complete dependability in the field," Cromwell says. "Plus, because these are fully integrated Kohler generators, we're able to stand behind this line in an elevated manner, which includes a comprehensive global three-year warranty."



SERVICE ON DEMAND

When service is needed, Kohler has a global dealer and distribution infrastructure consisting of more than 800 facilities offering parts availability 24 hours per day, seven days per week. Distributor technicians are factory-trained to provide fast and accurate assistance and have expertise in power specifications, equipment integration and more.

KOHLER
IN POWER. SINCE 1920.

Kohler has been a global force in power solutions since 1920. The company is committed to reliable, leading-edge products and comprehensive after-sale support. Kohler's acquisition of SDMO in 2005 created one of the world's largest manufacturers of generators and power solutions. The companies collectively have more than 150 years' experience in industrial power and now benefit from global research and development, manufacturing, and sales and service. For additional information:

800/544-2444 • kohlerpower.com • generator.feedback@kohler.com

Turn Data Into Decisions With Claros, the Water Intelligence System From Hach

Changing regulations, unpredictable influent levels, unplanned instrument downtime, irregular samples and incorrect data logging are all problems plant operators face. Without a clear picture of their water or data, operators face uncertainty about efficiency and compliance. With 17 percent of the nation's wastewater treatment plants receiving penalties for compliance issues, there's a clear need for a solution.

Imagine the time savings, cost reductions, and peace of mind that a complete water intelligence system could provide. Channeling 70 years' instrument expertise and 25 years' software development in wastewater treatment, the Claros Water Intelligence System from Hach addresses three critical areas: instrument management, data management and process management, harnessing information to deliver guided insights for optimized plant operations.

IS YOUR INSTRUMENT DUE FOR MAINTENANCE?

Sludge. Scaling. Toilet paper. Probes at wastewater plants have a dirty job, and need proper maintenance and calibration. Even process equipment needs attention. Keeping instruments well-maintained means operators can trust measurement data.

Prognosys predictive diagnostics helps plant operators stay in front of instrument maintenance and calibration, reducing unplanned downtime and errant measurements. Mobile Sensor Management provides status alerts for all connected instruments within a single view, allowing operators to see their system's complete performance. Better instrument management helps reduce unplanned downtime, and lets operators know if changes to measurement data are due to an instrument or the water.

DO YOU HAVE THE DATA YOU NEED, WHEN YOU NEED IT?

Data on its own doesn't ensure compliance or reduce costs. Claros provides the insights into the data that can make the difference between optimization and compliance woes. Data traceability helps pinpoint where a data error may have occurred, while quick data compiling available in a central location provides accurate views of critical parameters.

Water Information Management Solution (WIMS) software combines water system data sources in a central, secure database, providing the tools needed for electronic and paper reporting, analysis and monitoring. When investigating data, the filters, drill-downs and custom forms help operators find insights hidden in raw data.

ARE YOU WASTING MONEY ON OVERTREATMENT?

There is a certain rhythm to wastewater influent, but there's no way to predict an unexpected peak load, so process management is crucial to ensuring cost-effective plant operation leading to compliance. Claros Real-Time Control Solutions (RTC) measures water continuously, providing major cost-savings opportunities such as reducing chemical dosing and basin-blower run-time, helping operators stay in compliance while using the least amount of chemicals and energy.



ARE YOU READY TO SIGN THAT REPORT?

With a complete picture of a plant's instrument, data, and process information, users will gain the insights needed for optimization. Proactive maintenance means less unplanned instrument downtime. Crucial operations can be automated around the clock. Data compiled from multiple sources provides actionable insights, so operators can run their plant efficiently and sign the report with confidence.



Hach has provided innovations to support its customers for more than 70 years. Hach gives customers confidence in their water analysis by delivering expert answers, outstanding support and reliable, easy-to-use solutions. Hach analytical instruments, services, software, and reagents are used to ensure the quality of water in a variety of industries in more than 100 countries globally.

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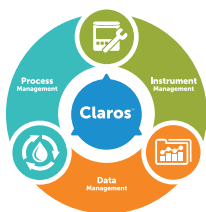
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AdEdge Offers Multiple Solutions for Arsenic Contamination

Compliance with the U.S. EPA and the World Health Organization's maximum contaminant level of 10 parts per billion for arsenic affects thousands of water systems throughout the United States and other countries.

The dangers of arsenic are masked by its colorless, odorless appearance. It is a carcinogen that occurs naturally in groundwater and is known for leading to dangerous health conditions such as cancer, neurodevelopmental disorders and heart failure.

AdEdge offers multiple water treatment solutions rated from 5 gpm to more than 12 mgd. The right option depends upon flow rates, arsenic concentration, the presence of co-contaminants, and site-specific conditions or limitations. Upon receiving a complete water quality analysis, AdEdge determines the best treatment for a plant's needs based on years of experience and an accurate, predictive model.

Options include adsorption using Bayoxide E33 granular ferric oxide media; coagulation/filtration with iron augmentation; and oxidation/filtration.

Pre-engineered AdEdge Packaged Units are the ideal solution for public water systems, schools, subdivisions and more. The company also offers a line of modular treatment systems that arrive assembled, ready for hook-up. These solutions can incorporate the adsorption, oxidation/filtration and/or coagulation/filtration treatment processes with pre- and post-treatment for a complete integrated system.

ADSORPTION PROCESS

In the adsorption process, contaminants break their bond with water molecules and chemically adhere to a filter media. This is accomplished by directing water flow through pressure vessels that contain the adsorptive media at a specific rate that allows the right contact time for adsorption.

Bayoxide E33 adsorption media is the industry standard for arsenic removal. This granular ferric oxide media reduces up to 99 percent total arsenic, including arsenic (III) and arsenic (V).

OXIDATION AND FILTRATION PROCESS

Oxidation/filtration is a precipitative process that removes naturally occurring arsenic (if it coexists with high levels of iron), as well as — iron, manganese and hydrogen sulfides. The process oxidizes the insoluble forms of these



contaminants into their soluble forms and then removes them via filtration.

Oxidation/filtration media has a high catalytic and oxidation capacity, superior handling properties, NSF 61-certification, does not require permanganate or coagulant addition, and has low operating and capital costs.

COAGULATION AND FILTRATION PROCESS

Coagulation/filtration introduces a coagulant, typically an iron or aluminum salt, to pretreat water contaminated with arsenic, iron, manganese and/or sulfides. The process allows for significantly higher flow rates per square foot of media, creates less backwash water than other conventional treatment approaches, and has a smaller footprint that allows for lower operating and capital costs. This process involves chemical addition and automated processes to decrease operator involvement and expense. It does not generate hazardous waste.



AdEdge Water Technologies specializes in the design, development, manufacturing and supply of innovative water treatment solutions that remove contaminants from process or aqueous streams. For more information, **866/823-3343 • sales@adedge technologies.com • www.adedgetech.com**



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Hurst Boiler & Welding Boosts Efficiency at Wisconsin Paper Plant

ST Paper, one of several companies owned by the STGroup, faced a challenge similar to that of other paper manufacturing plants: inefficient boilers fired by fossil fuels, high transportation and landfill costs incurred during paper byproduct disposal, and a business plan that needed to address sustainability.

Together, Global Energy Solutions Inc. of Wheaton, Illinois, and Hurst Boiler & Welding Co. Inc. of Coolidge, Georgia, helped address all three of ST Paper's stated concerns. Not only has ST Paper reached several important energy and efficiency goals, the company recently was awarded a grant from the state of Wisconsin's Focus on Energy.

"ST Paper celebrated the completion of its renewable energy system with the presentation of a check for \$237,500 from Focus on Energy," wrote the *Green Bay Press Gazette*. "The grant will be used to defray the cost of the company's new biomass energy system."

The equipment used in the project included a Hurst 1,500 hp boiler; a substoichiometric combination wet softwood biomass plus sludge fuel gasifier, combustor and heat-recovery system fed via metering bins; a dry electrostatic precipitator; and a mixed biomass fuel-handling system using a six-tree walking floor.

THE FUEL

A readily available fuel for ST Paper to consider was paper sludge — a clean, renewable manufacturing process byproduct. However, with a moisture content of nearly 70 percent, paper sludge alone was not a viable solution. In order to reduce the fuel's overall moisture content to a more acceptable level, ST Paper opted to mix fuels, adding clean, residual, construction wood products, also readily available.

THE SAVINGS

Both fuels — paper sludge and construction wood products — were previously transported for disposal at Wisconsin landfill sites at significant monetary and environmental expense. In addition, fossil fuel for the less efficient boilers represented a variable cost that was, at times, prohibitive. With the new solid fuel system, fuel costs are predictable and have been offset by the elimination of landfill and transportation fees.

Global Energy Solutions Inc., a Hurst Boiler representative, has assisted many Wisconsin-based manufacturing concerns with solid-fuel procurement and boiler efficiency challenges. Hurst Boiler & Welding Co. Inc. has exclusive solid-fuel boiler agents and boasts industrial and institutional campus renewable success stories throughout the Midwest and beyond.



A Hurst Boiler & Welding Co. Inc. 1,500 hp boiler is delivered to ST Paper, Oconto Falls, Wisconsin.



Hurst Boiler & Welding Co. Inc. has designed, engineered and serviced a complete line of solid fuel, solid waste, biomass, gas, coal and oil-fired steam and hot water boilers since 1967 for thousands of satisfied customers. Hurst also manufactures a complete line of boiler-room peripherals such as blowdown separator surge tanks and pressurized feedwater tanks. For more information: **877/994-8778 • www.hurstboiler.com • info@hurstboiler.com**

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-Jeff Pippenger, Utilities Administrator.
Eau Claire, Wisconsin Wastewater Treatment Plant

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"We added two 5,000 MMBtu/hr biogas boilers from Hurst to help heat the sludge before it enters the digesters," says Pippenger. "So we're using the gas produced in the digesters to heat the digesters."



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50
YEARS

FREE INFO - SEE ADVERTISER INDEX

Smart Ultrasonic Meter Meets Diverse Open-Channel Flow-Measurement Requirements

Open channels are a cost-effective solution for managing varying flow rates in unpressurized systems. However, flow through open channels cannot be measured by many common flow measurement technologies, and converting to a closed, full-pipe system can be costly and too restrictive for large flow events.

The Dynasonics iSonic 4000 flowmeter from Badger Meter is well suited for applications ranging from flow into water treatment plants, storm and sanitary sewer systems, and effluent from water resource recovery, to industrial discharge and irrigation channels.

It employs a noncontact ultrasonic level sensor to measure the water level in a flume, weir or other channel. The unit is programmed using three front-panel push buttons, with the programming menu offering a wide variety of primary flow elements.

COST-EFFECTIVE MEASUREMENTS

Based on Manning's equation, the flow rate is determined according to the dimensions, characteristics and water level of the channel. This correspondence between water level and flow rate allows for a cost-effective solution for measuring flow in angular open channels and partially filled pipes, as well as measuring volumetric contents of liquids in tanks.

"The iSonic 4000 is an intelligent and versatile ultrasonic meter/controller designed to meet a host of open-channel flow measurement requirements," says Cheryl Ades Anspach, marketing manager of Badger Meter. "Its unique features and IP67 rating enable reliable performance in challenging outdoor environments. The meter is an effective tool for influent and effluent measurement, flow control and data logging."

INTERFACING MADE EASY

The iSonic 4000 open-channel flowmeter easily interfaces with most SCADA systems. Simple to install and setup, it sends level, flow rate and total volume information over Modbus RTU. A robust data-logging feature with selectable intervals provides a backup of measurements in case of network outages or reporting lapses.

With an operating temperature range of -4° to 140° F (-20° to 60° C), the iSonic 4000 can be paired with the Badger Meter BEACON Advanced Metering Analytics software and AquaCUE Flow Measurement Manager system for use in utilities and water resource management.

Although the device normally functions as a flowmeter, it can be used for pump control based on the water level to reduce equipment costs. A rugged powder-coated aluminum enclosure protects internal components and extends asset life.



Badger Meter

Badger Meter is an innovator in flow measurement, control products, and communications solutions, serving water utilities, municipalities, and commercial and industrial customers worldwide. The company's products measure water, oil, chemicals, and other fluids, and are known for accuracy, long-lasting durability and for providing valuable and timely measurement data. For more information about the iSonic 4000 open-channel flowmeter:

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Open Channel Flow Monitors



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Electromagnetic Meters

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Contact our flow measurement experts to discover more.



www.badgermeter.com/flow-instrumentation/

FREE INFO – SEE ADVERTISER INDEX



Penn Valley's Double Disc Pumps solve problems at Illinois plant

Moline, Illinois, is located on the Mississippi River in northwestern Illinois. The city of 44,000, which is one of the Quad Cities, has two wastewater treatment facilities — the North Slope and South Slope plants.

In April 2010, plant staff needed to replace a piston (plunger) pump at the North Slope facility. The pump, which fed a unique blend of wastewater and lime blowdown sludge at up to 8 to 10 percent solids to the belt filter press, needed to pull a small suction lift, and it needed to operate against a discharge pressure between 10 and 20 psig because the belt filter press was across the plant.

The city of Moline turned to Penn Valley for answers. A 6-inch Penn Valley Double Disc Pump Model 6DDSX76 was installed on a trial basis in May 2010. The trial pump performed well, and the plant purchased it in August 2010. In May 2011, Moline purchased a second Penn Valley pump to replace another piston pump for belt filter press feed.

In the next three years, the city chose Penn Valley pumps for other replacements at the South Slope plant, including a 4-inch pump for waste activated sludge transfer, a 6-inch pump for primary sludge transfer, and a 4-inch pump for WAS transfer. In 2014, the city took bids for a \$40-million plant upgrade at the North Slope facility. Because of success with the city's five existing Penn Valley pumps, plant staff urged the consulting engineer to use Penn Valley in the new plant design, which resulted in the purchase of seven additional Penn Valley 6-inch pumps.

Are you forced to do more with less?
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Penn Valley Pump Company, Inc. has been developing, manufacturing and marketing Double Disc Pumps for the municipal, industrial and chemical industries since 1980. The company has created a range of positive displacement solids handling pumps that provide unmatched durability, reliability and performance.
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Complete Blower Package Results in Quiet Operation, Easy Maintenance

Until 2012, the Kaufman (Texas) Wastewater Treatment Plant operated two separate aeration basins with mechanical surface aerators. As the plant's equipment aged and required more frequent and expensive maintenance, the city followed its engineering firm's recommendation to install a more efficient fine-bubble diffusion air system rather than simply replacing its old mixers.

Phase 1 of the project added two positive displacement (PD) blowers to replace the mixers in the south side aeration basin. While the PD blowers did cut down on maintenance calls and energy use, the blower packages proved less than ideal.

A year after the first PD blowers were installed, the plant began Phase 2, which included replacing the two mixers at the north side aeration basin. The new engineering contractors had experience with Aerzen equipment and recommended two Aerzen Generation 5 model GM 25 PD blowers.

The result is a blower package with a much lower overall noise level that maintains quiet operation over the life of the blower. "We've been very pleased with the Aerzen equipment," says Terry Petrea, chief operator. "We've had no maintenance issues. It runs without problems."

Petrea noted that the plant has seen a reduction in maintenance costs and man-hours in the three years since it replaced its last two mixers with the Aerzen blowers.



Whether a marathon-runner or a sprinter, MBR or SBR system, the reliable and proven performance of AERZEN Turbo Blowers exceeds all expectations.

AERZEN Turbos impress with up to 80% efficiency. As the core unit in compound systems they generate energy savings of up to 30%. AERZEN Turbo Blowers feature a small footprint and are engineered to integrate seamlessly, with other aeration blower technologies, as the base load blower.

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1,000-year flooding tests 3DP Model belt press

When it's time to replace dewatering equipment, the options can seem endless, with newer designs claiming increased performance and reduced O&M. Although larger plants traditionally choose centrifuge technology to achieve high-end dewatering at high loading rates, the three-belt filter press has become a viable option. By using an independent gravity belt in conjunction with a heavy-duty pressure section, the three-belt filter press has proven it's in a different league than traditional two-belt units.

NATURAL DISASTER REVEALS CAPABILITY

In May 2010, Tennessee was hit with 1,000-year flooding. At Nashville Metro's Dry Creek Wastewater Treatment Plant, many buildings flooded, including the dewatering building that housed four 2.2-meter belt filter presses. Emergency dewatering services were provided with belt presses on mobile trailers. BDP provided a 1-meter three-belt unit on a trailer and then a 1.5-meter 3DP trailer-mounted belt press, which operated at the facility until September 2011.

Initially the 1-meter BDP unit processed 200 gpm and produced better results and a drier discharge consistency than the existing four units combined. When the 1.5-meter 3DP arrived on site, it processed 300 gpm while still providing drier discharge solids. Because of the success of the mobile units over almost 18 months, the Dry Creek plant purchased a 1.5-meter press to operate permanently.



BDP Industries is a leading supplier of dewatering, thickening and composting equipment with hundreds of installations throughout the world. The company's main products include belt filter presses, screw presses, gravity belt thickeners, rotary drum thickeners, and in-vessel composting systems.
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Fortiline Plant Group Bidding Software Upgraded for 2017

In 2016, Fortiline Waterworks developed a new treatment plant bidding program that allows for quick conversion to MINCRON distribution management software systems for a bid contract.

Once the bid is in a contract format, Fortiline's Plant Group can track usage from purchase orders and send reports to customers, keeping them up to date on contract material usage for individual projects.

Fortiline will launch an enhanced version of the program by the end of 2017 that will feature multiple upgrades to enter and change bids even more quickly. The enhanced bidding program will feature an extensive database of material, making it easy to get from the main menu to a specific product to add to a quotation.

Inside each product category are hundreds of thousands of items, all with current pricing and submittal images that can be used with the bidding process. Fortiline can quickly pull items from this database to build a quotation, adjust the cost to the bid, and send the scope to customers. This will allow Fortiline to make quick and efficient changes to bids if required, as addendums are released on projects.

The bidding program automatically populates a summary of each project with every bid as items are added to the quote. It also groups items by category and displays a running dollar amount, along with weights, so that a customer can see the cost for each product grouping.

Fortiline Plant Group developed the new bidding program with customers in mind, making the bidding process one of the most efficient in the country.

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ACE18 Promises Operators Solutions With Face-to-Face Interaction

The American Water Works Association is planning its annual ACE18 conference and exhibition June 12-14 in Las Vegas. It aims to bring together the best and brightest minds in the industry, as more than 900 expert presenters are set to explore more than 21 topic areas to exchange ideas about water.

There will be more than 450 exhibiting companies — all in one location — specializing in engineering, manufacturing, membrane filtration systems, laboratory equipment, security, and wastewater products and services.

The conference aims to make ideas come to life by inspiring and connecting the water industry with innovative solutions and new insights.

Water operators will discover new techniques and trends in water treatment technologies through three programming days, all while networking with established industry leaders. Operators also can earn continuing education credits at ACE18.

ACE18 offers discounted operator and small utilities full-conference registration. The special pricing will be available until April 25, 2018.

“ACE17 was a terrific opportunity for an operator,” says Aaron Benko of Denver Water. “I learned about so many technical aspects, from filtration to algal blooms to corrosion control. Every minute there was someone from the water industry ready to trade operational tips, different work aspects, material reviews or just to chat with. It was by far one of the most fun conferences.”



American Water Works Association

The American Water Works Association is an international, nonprofit, scientific and educational society dedicated to providing total water solutions ensuring the effective management of water. Founded in 1881, the association is the largest organization of water supply professionals in the world. For more information: www.awwa.org

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It's All About Solids Capture

The Kenosha (Wisconsin) Water Utility recently embarked on a plan to increase the generation of methane gas to produce electricity and turn biosolids into a usable Class A product.

Its Energy-Optimized Resource Recovery Project is a model for midsize facilities looking to become leaders in wastewater innovation. From the beginning, KWU realized that to achieve its goals, it was critical to remove the maximum amount of solids at the plant headworks.

To increase solids capture, the utility replaced its old coarse bar screens with two Enviro-Care Model FRSIII FSM Filterscreens with a verified solids capture rate of more than 85 percent.

Each screen has 6 mm holes and is rated for a peak flow of 50 mgd. The Filterscreens are equipped with FSM's proprietary auto-adjusting cleaning brushes, which require no manual adjustments for the life of the brush. These high-capture screens significantly improve downstream processes including digester performance and produce cleaner biosolids.

Kenosha is seeing a 900 percent increase in solids capture, according to a utility spokesperson. Since the screens were installed, there have been no primary clarifier failures; no floatables on the clarifiers, wet wells or aeration tanks; and no rags in the centrifuge tanks.

To reduce the volume of these solids going to landfill, Kenosha also installed two FSM washer compactors each with a capacity of 176 ft³/hr, which produce more than 40 percent dry solids and achieve 60 to 85 percent volume/weight reduction.



Enviro-Care Company, a member of the WAMGROUP, supplies screening and solids/grit management equipment to the North American water and wastewater markets. Brands include SAVI, SPECO, WAM and FSM Frankenberger. For more information:

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REXA actuators offer reliable control of any valve or gate service. Its electrohydraulic technology, operates like an electric actuator that employs a hydraulic transmission without the use of an actively pressurized reservoir system.

The technology eliminates maintenance burdens, liability concerns and high costs of ownership. The result is a hydraulically driven actuator designed to modulate accurately and reliably over long periods without attention.

SUPERIOR CONTROL

REXA can turn any valve or gate into an accurate flow control device. Specifically, REXA can modulate a butterfly valve close to the seat, dramatically improving the efficiency of processes such as aeration or filtration. The company can also modulate gates in collections and UV systems.

RELIABLE OPERATION

REXA is designed to reliably operate in demanding applications and during worst-case scenarios, easing worries about collections system gates moving during wet-weather events. The technology can offer operators peace of mind, assuring them that critical valves and gates will operate when called upon.

DRAMATIC COST REDUCTION

Products that operate reliably over long periods eliminates unnecessary costs. REXA can eliminate unexpected failures on demanding valve or gate services, helping users' bottom line.



REXA is a custom-designed, American-made product designed to solve problems through retrofits of existing infrastructure or in new construction. For more information: **508/584-1199 • sales@rexa.com • www.rexa.com**

Rely on REXA to Solve Your Actuator Problems

REXA delivers the **reliability** you need to move your gates during wet weather events.

REXA offers the **control** required to manage your collection system during high flow scenarios.

REXA provides you **maintenance-free** service that reduces downtime and eliminates cost of ownership.

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REXA
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Get More Sustainable Operations Via Energy Optimization

After the Kenosha (Wisconsin) Water Utility set a goal for a more sustainable wastewater treatment plant, Centrisys and CNP focused on a practical and sustainable process solution. Centrisys builds decanter centrifuges and dewatering systems, while CNP designs and supplies nutrient-recovery systems focusing on optimizing biosolids treatment processes.

The companies delivered technologies to meet KWU's environmental goals and saw cost savings using the Centrisys CS214HC dewatering centrifuge; Centrisys THK200 for waste activated sludge; Centrisys THK200 for primary sludge; CNP PONDUS Thermo-Chemical Hydrolysis Process; and the Sülzle Klein Compact-Dry belt dryer.

PREDIGESTION PHOSPHORUS RECOVERY

CalPrex, acquired by CNP, is a calcium phosphate-recovery technology process that solubilizes sludge's phosphorus and recovers it as brushite — a plant-ready fertilizer that requires no further processing. Combining CalPrex and AirPrex recovers over 50 percent of total phosphorus, allows for digester and equipment protection, and reduces biosolids disposal amounts and polymer for dewatering.

REDUCE POWER USAGE

Dewatering upgrades don't get much bigger than Wards Island in New York. Performance testing for the Wards Island centrifuge installation (16 Centrisys CS26-4 centrifuges) was completed in September 2017, showing better-than-spec performance. There was 50 percent power reduction compared to old centrifuges, 25 percent higher throughput compared to old centrifuges, 17 percent lower polymer consumption than specification, 1 percent drier cake than specified, and guaranteed 99 percent capture at 270 gpm — 4 percent higher than spec.



Centrisys Corporation is a U.S. manufacturer of dewatering and thickening centrifuges, as well as complete dewatering systems for municipal and industrial wastewater. The company's focus is centrifuge equipment, including the award-winning sludge thickener THK series. **CNP Technology Water and Biosolids Corporation** designs and supplies systems for nutrient recovery and sludge optimization. Led by a team of wastewater industry veterans and supported globally by engineers with decades of experience in biosolids treatment, CNP continues to pioneer innovative wastewater system solutions. For more information: **262/654-6006 • info@centrisys.com • info@cnp-tec.com • www.centrisys.com • www.cnp-tec.com**



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Reduce Your Power Usage

Performance testing for the Wards Island centrifuge installation in New York, NY completed September 2017 with **better than spec performance**.



50% Power Reduction
(compared to old centrifuges)



99% Capture at 270 gpm
(4% higher than spec & guaranteed)



Capture the Most Phosphorus



Reduce Phosphate
Recycle Load
up to **90%**



Recover Over **50%**
of Total Phosphorus

Discover more at **Centrisys.com**



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CNP - division of Centrisys Corporation

Examining Submersible Mixers for Maximum Value

Most operators realize that submersible mixers can be their best friend or worst enemy. It's important to do the homework and choose the right one. If an operator thinks "a mixer is a mixer," they may be overlooking some significant money-saving technologies on the market, and could have some headaches in store.

Like any major purchase, the upfront cost of a submersible mixer isn't the only factor to take into account. Operators must evaluate the entire mixer design to find its operating cost and service life. Here are a few cost considerations to take into account.

PROPELLER DESIGN

Make sure propellers can withstand unbalanced forces due to asymmetrical inflow and variations in density of the medium. Will the propellers withstand impact and not become distorted? Does the blade design have sharp leading edges, or does it require an anti-vortex shroud or flow ring? Those can make it susceptible to ragging, which requires more maintenance.

PENETRATION POINTS

Take a look at the number of seals protecting the chambers and motor, and ask the vendor how often they must be replaced. Are the cables protected and sealed? How accessible are the oil drain plugs?

DURABILITY AND LONGEVITY

See that the mixer body is made of a noncorrosive material and, if not, insist on a protective coating. Take note of the coating material and how

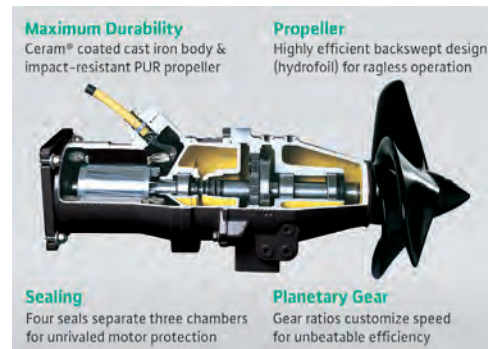
many layers there are. Find out the overhang of the driveshaft — the distance between bearing and propeller — and find out the hardness of the steel.

ENERGY EFFICIENCY

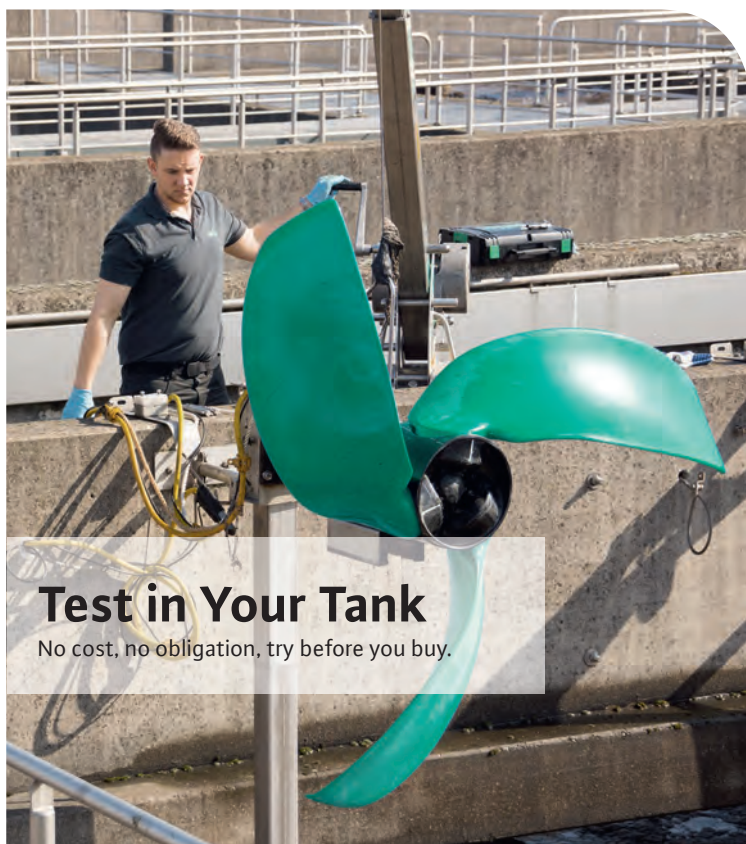
Learn the differences between direct-drive, helical-gear and planetary-gear mixers, and note whether they're one stage or two. What is the power requirement? What is the efficiency of the motor? What is the energy cost per year?

With all of those costs to consider, the final decision can make all the difference. Make sure to choose a reliable vendor that will stand behind its products with a warranty that makes you comfortable.

With all of those costs to consider, the final decision can make all the difference. Make sure to choose a reliable vendor that will stand behind its products with a warranty that makes you comfortable.



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- The K-S Biosolids Drying System operates with full integration of all components. The company has successfully installed systems for more than 20 years, which illustrates the equipment's durability and the company's commitment to supporting customers over the long haul.
- The K-S Gravabelt gravity belt thickener is available for very small to extremely large flows and includes Roto-Kone performance enhancing technology. With several models available, the unit can meet specific requirements and exceed performance expectations.
- K-S Plunger Pumps continue to perform after 40 years of operation. These rugged pumps are the workhorse of the industry.

K-S employs highly skilled and technical field service engineers who know the equipment and listen to and respond to customer needs and concerns, which results in installations that perform well. The company provides factory-made original equipment parts and filter fabrics for belt filter presses, gravity belt thickeners and more, and it works with customers to ensure that equipment exceeds expectations.

The company's experience ranges from simple one-machine installations to complex multistep processes and systems. Reliability, ease of operation, rugged design, proven performance and superior customer service are hallmarks of Komline-Sanderson installations.



Since its incorporation in 1946, **Komline-Sanderson Engineering Corporation** has provided quality equipment for process/production filtration, drying, wastewater treatment, sludge processing and pollution control.
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- low polymer cost



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- wastewater clarification
- high float solids



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- wastewater clarification
- continuous operation



Plunger Pump

- sludge transfer
- positive displacement
- high suction lift



Level Controller Provides Solution for Pump Station Call-Outs

Not long after startup in two new lift stations, Rick McKinnon, public works supervisor for the town of Eckville, Alberta, became aware of some problems. He and his team were receiving callouts from false high-level alarms.

They investigated and experimented with baffles and stilling wells, attempting to reduce the periodic build up of foam and grease that most likely was causing the ultrasonic sensors to lose echo in the pump stations.

FINDING A SOLUTION

Carbon Controls in Calgary, Alberta, recommended the Greyline PSL 5.0 Pump Station Level Controller. The PSL 5.0 is designed to operate with both a noncontacting ultrasonic sensor plus a generic 4-20 mA level signal from a redundant sensor.

The transition from primary ultrasonic to redundant level signal is seamless, and transfer to the redundant signal is displayed to the operator with usage hours logged for troubleshooting. The PSL 5.0 also features six programmable relays with alternation modes, and a pump run-time report. Using the pump run-time reporting function, McKinnon can spot pump problems before they fail and plan pump maintenance.

IMMEDIATE RESULTS

No more callouts. Having a redundant level-monitoring method within a single meter allows for seamless operation in the case of temporary loss of the ultrasonic signal, and there will be no trips of the high-level alarm resulting in futile maintenance visits.



GREYLINE
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Greyline is a worldwide leader in ultrasonic instrumentation for industrial and environmental markets. The company develops, manufactures and markets industrial flow- and level-monitoring instruments including ultrasonic level transmitters, flowmeters and open-channel flow meters. For more information: 613/398-8956 • info@greyline.com • www.greyline.com



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- Works with ultrasonic sensor plus redundant sensor input
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- Pump Runtime Report



PSL 5.0 Pump Station Level Controller

Watson-Marlow Offers Advanced Bredel Hose Technology

Bredel hose pumps reliably handle harsh materials, including abrasive sewage and slurry, making them ideal for feeding primary or thickened sludge to digesters or filter presses.

Advanced hose technology enables Bredel pumps to handle viscous, grit-filled sludge dependably for extended periods. Peristaltic hose pumps are virtually maintenance-free, with no seals to replace, no check valves to clog, and no rotors and stators to wear.

The highly abrasive nature of sludge does not affect pump life. Hose replacement is quick and easy, minimizing downtime. Only one spare part — the hose — needs to be inventoried. These features makes Bredel hose pumps ideal for tough environmental applications.

Bredel hose pumps also eliminate many pieces of ancillary equipment such as run-dry protection, seal-water flushing systems and in-line check valves. They are backed by a two-year warranty.

Watson-Marlow Fluid Technology Group is a world leader in niche peristaltic pumps and associated fluid path technologies. Founded on nearly 60 years of supplying engineering and process expertise and with over 1 million pumps installed worldwide, Watson-Marlow's pumps are tried, tested and proven to deliver.



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Watson-Marlow Fluid Technology Group comprises 10 established brands, offering an unrivaled breadth of solutions for pumping applications. For more information: **800/282-8823 • info@wmftg.us • www.wmftg.com**

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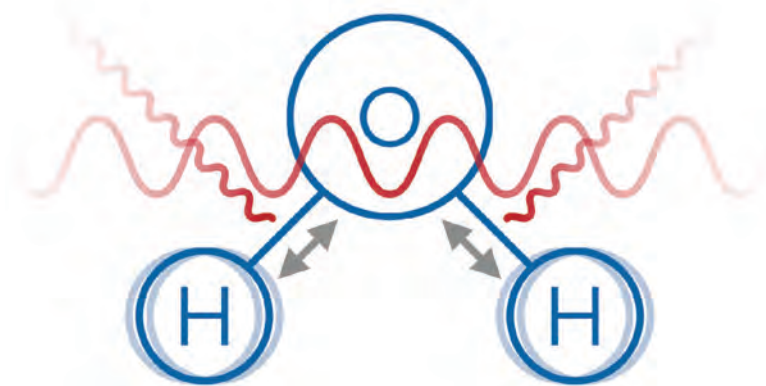
CEM Offers Innovative Solution for Solids Analysis

Improving on the SMART Turbo — which is used in treatment facilities around the world — CEM Corp.'s SMART 6 uses the proprietary new iPower technology to dry samples more rapidly and accurately. The compact SMART 6 provides accurate solids analysis in under three minutes.

This versatile and easy-to-use system can measure effluent solids as low as 500 ppm and sludge up to 60 percent solids. The ability to rapidly determine the cake solids during dewatering enables quick equipment adjustments to reduce polymer costs, which results in significant savings in capital.

ADVANCED TECHNOLOGY

iPower is an innovative drying process based on the use of a dual-frequency energy source controlled by an intelligent processing system. This prevents burning and incomplete drying, which can arise from single-frequency-based solids analyzers. The result is a direct method for virtually any type of sample, with faster drying than traditional microwave and infrared-based systems.



CEM Corp. is a private, family-owned company located just outside Charlotte, North Carolina. The company was founded in 1978 by a chemist, electrical engineer and mechanical engineer, and now operates in more than 60 countries worldwide.

CEM specializes in innovative laboratory solutions and holds over 300 patents and 11 *R&D 100* awards. CEM's team of engineers and scientists are passionate about designing differentiated instruments to better serve the wastewater, environmental testing, pharmaceutical, food testing and processing, biotechnology, personalized medicine, health and beauty, academic and research markets, among others. For more information:

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Improved Process Control With SEEPEX BRAVO Chemical Metering Systems

The environmental industry assumes that chemical metering pumps must always be subject to heavy monitoring, frequent parts replacement and disposal on a regular basis. Pumps are expected to pulsate, allowing a greater opportunity for unstable flow as operators are forced to overfeed or underfeed chemicals in their process. These practices cause unplanned variances, water quality issues, and increased cost and downtime.

SEEPEX — a leading global manufacturer of progressive cavity pumps with decades of experience engineering systems and controls — has released SEEPEX BRAVO Chemical Metering Systems, a market-driven chemical metering process control solution.

Complete process control is possible with BRAVO because systems are equipped with self-priming, NSF/ANSI 61-certified SEEPEX progressive cavity metering pumps. Progressive cavity pumps offer several advantages compared to conventional chemical metering pumps due to accurate, repeatable, low-shear metering with laminar flow, minimal pulsations and no vapor lock.

Pulsation dampeners can be eliminated and chemical consumption is reduced. Slip is minimized even when fluid temperature, viscosity or discharge pressure fluctuates. Progressive cavity pumps also wear predictably, so there is no risk of catastrophic failure.

CUSTOMIZABLE CONFIGURATIONS

BRAVO is an integrated, modular and scalable solution used in a variety of industries for disinfection, pH control, flocculation, corrosion inhibitors,

oxygen scavengers and containment elimination. These plug-and-play packaged skids minimize time and cost associated with engineering, procuring, assembling and installing flow-control systems.

BRAVO can be adapted to any layout and is available in simplex, duplex or triplex pump configurations for floor or wall mounting. BRAVO is offered with user-customized, color display, touch-screen advanced process controls and handles pressure ratings up to 175 psi and flow rate capabilities from 0.1 gph up to 250 gph.



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SEEPEX Inc. is an ISO 9001-2008 certified manufacturer and a leading international supplier of progressive cavity pumps, systems, accessories and services. SEEPEX takes a consultative approach to offering innovative products and customized solutions for fluids handling and processing applications in nearly every industry. For more information:

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Utility barges from American Pleasure Products provide operator stability

When it comes to maintenance work or routine inspections on ponds, lagoons or reservoirs, utility service barges from American Pleasure Products provide a safe, stable working environment for treatment plant operators.

The Aqua Cycle 8-by-12 utility service barge offers stability, thanks to two 12-foot-long by 23-inch-diameter pontoons. The barge includes aluminum-frame construction with stainless steel hardware and pressure-treated, marine-grade plywood flooring.

Cleanup is a breeze because of the barge's vinyl decking. A protective heavy-duty handrail keeps employees stable, while a protective lower rail secures tools on board.

Depending on your plant's needs, the utility service barge is available with optional solar chargers, boarding ladder, 1,000-pound-capacity crane or a galvanized trailer. Additionally, the barge can be equipped with life-ring pivot arms that can secure the barge to aerator tubes when servicing diffuser drop tubes.



American Pleasure Products provides American-made paddleboats, rafts and service barges. The Michigan-based company produces its own tubing, using 5052-H32 aluminum.

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LaMotte Company's DC1500 waterproof chlorine colorimeter now includes a rechargeable battery and is packaged with DPD tablets for 100 tests or liquid DPD reagents for 140 tests. The unit can be used in the field or lab, and it covers the entire critical chlorine range of 0-4 ppm with an MDL of .03 ppm.

The colorimeter includes a sturdy carrying case and six glass vials, a USB cable and wall adapter. The unit meets IP67 waterproof criteria so users in high-moisture environments can take the DC1500 anywhere.

Operation is easy and efficient, thanks to a large graphic, backlit display and a simple menu-driven operation.



Since 1919, **LaMotte** has offered quality equipment and guidance for water analysis. The company produces a broad line of portable test equipment and focuses on specific needs by offering strong technical support and an extensive custom test kit service.

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HUBER Technology Offers 24-Hour Service Division

Customer loyalty is built not only on superior product quality, but also on the motivation of a producer to offer lifelong product assistance. That's why HUBER Technology is now at operators' disposal around the clock and around the world.

With a service division that operates 24 hours per day, seven days per week, HUBER now offers added services and the ability to maintain the high level of performance customers deserve.

A PHILOSOPHY OF RESPONSIBILITY

HUBER isn't content simply supplying products. It also claims responsibility for the operation, functionality and performance of the machines it sells. "We provide solutions to your problems and provide high-caliber, after-sale service equal to the high-caliber fabrication of your machines," says Patrick Sheehan, field service manager. "HUBER Service is your partner offering the assistance which ensures optimal, long-term, trouble-free operation of your machines throughout their whole product life cycle."

Before a sale, the company's sales representatives, along with in-house specialists, offer expertise to provide unique solutions that match site-specific needs and objectives. From delivery to startup, factory-trained field service specialists are on hand.

"This same group of experts are there over the life cycle of your equipment around the clock," says Sheehan. "In addition to our services in the U.S., Canada and internationally, we offer consulting, installation and service with our respective sales companies and partners."



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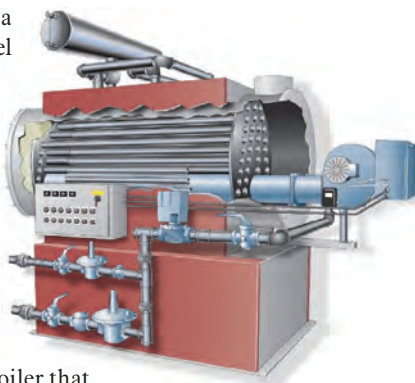
HUBER Technology provides equipment for municipal and industrial water and wastewater treatment. Its focus is on liquid/solid separation and headworks equipment. For more information:

Reduce Thermal Shock With Walker Process' Modulated Boiler Control

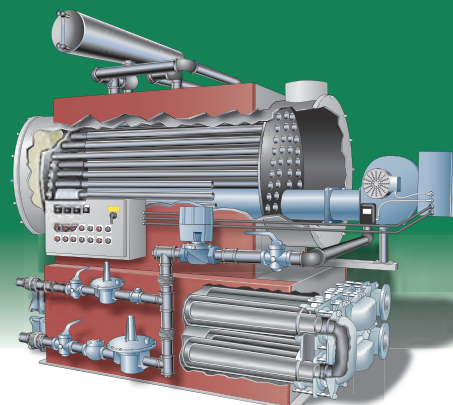
Walker Process Boilers are Scotch marine fire-tube boilers with a highly efficient forced draft dual-fuel burner system that uses digester gas as the primary fuel. It can also use natural gas, propane or fuel oil as an alternate fuel if digester gas pressure is unavailable.

All Walker Process Boilers are supplied with a complete electrical control system that includes a modulating control system. The modulated control of the burner reduces the thermal shock on the boiler that can occur with an on/off control system.

Boilers by Walker Process are built according to ASME Boiler and Pressure Vessel Code, Section IV, checked in the supplier's factory by a qualified independent inspector and stamped with the ASME "H" designation. Each unit is shop assembled and thoroughly tested prior to shipment.



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Walker Process Equipment has supplied high-quality engineered and manufactured equipment to the water environment industry since 1946. For more information:
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The Tote Bin Scale from Force Flow allows plant operators to accurately monitor the amount of polymer fed from IBC-type totes for dewatering. Operators simply place the tote on the platform and monitoring begins. There is nothing to install inside the tote.

Monitoring systems prevent costly over-feed conditions and also enable documentation of the actual amount fed, keeping operators in compliance with federal and state reporting requirements.

The Tote Bin Scale can be remotely monitored via SCADA or PLC and is available with the SOLO G2 digital display or the advanced Wizard 4000 chemical inventory monitoring system.



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Force Flow continues to take the lead as an innovator in chemical monitoring with products like the Wizard 4000 and Chlor-Scale 150 for cylinders. The company also offers a five-year warranty and performance guarantee. For more information about the Tote Bin Scale:

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Parker's TC Series Boilers Boosting Thermal Efficiency

Parker Boiler Co. is helping treatment plants qualify for lower utility rates by reducing reliance on backup power. One recent example of that was the 41 mgd Roger Road wastewater plant in Pima County, Arizona.

To qualify for the lower rate and maximize the use of digester gas, the staff installed a Parker TC Series boiler to heat five digesters, eliminating the need to tap an engine-generator for digester heat.

The TC Series features a front door that swings open to allow easy cleaning of the chamber and tubes. The boilers also include a Siemens LMV parallel positioning system for fuel/air ratio control.



Parker Boiler Co. is a manufacturer of industrial and commercial steam boilers from 1.5 to 150 hp with pressures to 250 psi capable of delivering dry steam in fewer than 10 minutes. For more information about the company's boilers:

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Nozzle mix system increases efficiency with dual-zone mixing

The JDV Nozzle Mix System is a patented dual-zone mixing technology that provides uniform mixing patterns to produce even distribution and a stable environment.

The JDV Nozzle Mix System optimizes solids suspension and contact, which increases efficiency in a wide range of applications. The system is designed for easy maintenance, with pumps installed outside the tanks. The pumps are typically chopper pumps, or pumps with inline grinders, which prevent fibrous materials from accumulating and causing plugging problems. Various pumps can be used, depending on application. The high-velocity nozzles are mounted inside the tank and are positioned to discharge in a flow pattern that completely mixes the tank contents.

The mix system can be used for anaerobic digestion, bio-solids storage, blending tanks, excess flow tanks, septage or leachate, anoxic zones, CSO handling, aerobic digestion, assisting secondary treatment and biosolids holding ponds.



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Kuhn Knight SLC 100 Series Spreaders Provide Fast, Efficient Spreading

The Kuhn Knight SLC 100 Series ProTwin Slinger Commercial manure spreaders set the standard for efficient spreading. They provide an ideal combination of efficiency, versatility and durability to give maximum return on equipment dollars.

The twin-auger design and body construction allow the Slinger to handle a variety of wet and dry materials. The all-new, fully adjustable discharge results in faster unloading and improved material breakup for more consistent, accurate spreading.

A new hammer design provides more wear surface on the bottom edge to extend hammer life. The heavy-duty drive requires minimal maintenance and provides years of reliable service.

Optional scale systems are available to track and record applied nutrients. These new manure spreaders are available in 2,600- to 5,000-gallon capacities, along with truck and trailer configurations.



WIDE DISCHARGE, IMPROVED MATERIAL BREAKUP



Adjustable Hammer Shroud

SLC 100 SERIES PROTWIN® SLINGER®

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- Twin-auger design eliminates material bridging
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- Optional scales for precise monitoring and nutrient tracking

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Water Environment Federation Presents Awards for Operational and Design Excellence

The Water Environment Federation presented its 2017 Operational and Design Excellence Awards during last October's WEFTEC conference in Chicago. Recipients are:

Collection Systems Award for advancing the state-of-the-art wastewater collection:

Keith McCormack, P.E., Hubbell, Roth & Clark, Bloomfield Hills, Michigan. McCormack has more than 30 years' experience in planning, design, construction and regulatory compliance in collections systems and treatment facilities. He has continuously held leadership roles for two decades with WEF and the Michigan Water Environment Association.

Innovative Technology Awards for WEF Associate Members who have introduced new products or services for treatment facilities:

Wipes Ready grinders, JWC Environmental. This product effectively handles the nonwoven sheets that have been a scourge of industry for the last five to 10 years. It has been shown to consistently remove the material and eliminate re-agglomeration.

Aqua Assist, DryLet. The product has the potential to change the way wastewater plants are designed. It significantly increases removal of organic compounds by providing a substrate for bacteria to populate.

I Range Products, HydroFLOW USA. Powered by HYDROPATH Technology, this offering effectively removes struvite buildup in digesters and pipelines.

Peter M. Brown; TransAqua, Morgan Operational Solutions Award. The sewage boat solves a difficult operational problem while saving money and improving safety.

Metropolitan Water Reclamation District of Greater Chicago, Schropfer Innovative Facility Design Medal, Completion of the Calumet Tunnel and Reservoir Plan. The Calumet TARP system provides substantial capital and operating savings for the municipalities it serves by relieving the burden of creating individual systems to capture and treat CSOs. It also provides \$40 million in annual flood damage savings.

Metropolitan Water Reclamation District of Greater Chicago, Water Quality Improvement Award, Completion of the Calumet TARP. The Calumet TARP includes a 7.9-billion-gallon reservoir and 37 miles of deep tunnels that reduce flooding and eliminate CSOs for the 556,000 people it serves. It has also increased dissolved oxygen levels and increased fish populations and fish species in waterways.

WEF Project Excellence Awards for excellence and innovation in the execution of projects and programs in the water sector:

Alexandria Renew Enterprises, Virginia, State-of-the-Art Nitrogen Upgrade Program. Alexandria Renew Enterprises, owner; CH2M, designer; Jacobs Engineering, construction manager; Clark Construction/Ulliman Schutte Joint Venture, construction manager at risk. AlexRenew addressed pending regulations while renewing its commitment to sustainability, innovation and the surrounding community. The resulting project included a



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long-range planning study and the design and construction of a \$131 million upgrade that is at the forefront of nutrient removal technology.

Metropolitan Water Reclamation District of Greater Chicago, Stickney Water Reclamation Plant nutrient recovery facility. Black & Veatch, design/builder; Ostara Nutrient Recovery Technologies, technology provider. The project included a nutrient recovery system and conversion of the 1.44 bgd plant to biological phosphorus removal.

Town of Riverhead, New York, Water Resource Recovery Facility, Upgrade and Reuse Program. H2M architects + engineers, designer. The \$24 million project included a 1.5 mgd ultrafiltration membrane bioreactor and reclamation system with a fully integrated wastewater reuse process train. The town will reuse up to 100,000 gpd of in-plant wash water and makeup water. The plant provides up to 450,000 gpd of reuse water for golf course irrigation.

Linden (Michigan) Water Resource Recovery Facility, WEF Safety Award. The Linden facility has shown a top-down commitment to safety, including employment of a dedicated safety manager, and has received complimentary feedback from its insurance carrier.

For more information about the WEF Awards, visit www.wef.org/awards.

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Bright Technologies Rescues City With Rental Equipment

After its only operational centrifuge failed in 2016, the city of Hastings, Michigan, needed a dewatering solution to avoid discharge limit exceedances. Operators called Bright Technologies for a rental belt filter press, and a 1.7-meter trailer-mounted belt filter press arrived the next day.



The company also sent a technician to help set up the equipment and train the operators. The unit was up and running that same day at a 90 gpm processing rate, and it continued operating until the centrifuge was repaired.

"These units have worked extremely well for our dewatering needs," says Lee Hays of Hastings Public Services. "When we experience issues with our dewatering centrifuges or want to perform periodic maintenance on the units, our preferred solution is to contact Bright Technologies for assistance with temporary dewatering."



Bright Technologies, a division of Sebright Products, manufactures equipment for dewatering and solidification of wet materials. For more information:

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Chuck Gray
Water Superintendent
Mount Vernon (Ind.) Water Works

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Tony Wood came from a lab background and had to teach himself about wiring, controls, diagnostics, land application requirements, maintenance, safety and more.

“I’ve had to learn everything the hard way, under fire.
I’ve grown from a dumb kid of 25 into a guy who
has figured out every aspect of this operation.”

TONY WOOD

'DUMB KID' NO LONGER

TONY WOOD LEARNED THROUGH LONG AND HARD EXPERIENCE TO BECOME AN EXPERT OPERATOR, SUPERINTENDENT AND GRANT WRITER FOR THE CLEAN-WATER PLANT IN OSGOOD, INDIANA

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

TWENTY-FIVE YEARS AGO, TONY WOOD'S LIFE MADE A RIGHT-angle turn: He got married and within a month became the chief operator of the Osgood (Indiana) Wastewater Treatment Plant. While he had no experience in either case, he's been successful at both.

He and his wife, Laurie, who is a teacher, have four children — two just graduating from college and two in high school. He has managed major upgrades and a complete turnaround at the Osgood plant and was named Wastewater System Operations Specialist of the Year for 2017 by the Alliance of Indiana Rural Water.

"I've had to learn everything the hard way, under fire," says Wood. "I've grown from a dumb kid of 25 into a guy who has figured out every aspect of this operation." Today, Wood is plant superintendent in Osgood and operates the wastewater treatment facility in the nearby small village of Friendship.

HELP NEEDED

The Osgood plant was in less than great shape when Wood arrived in 1992. He had worked in the quality control lab of a bottling plant and had some familiarity with industrial wastewater since he was responsible for the company's water purification system and water testing. But this was different.

"The bottling plant decided to move, but I wanted to stay in the area," he recalls. "The Osgood plant posted an opening, and I interviewed and got the job. The plant had numerous violations. There was personnel turnover, turmoil, lots of problems. Of nine parameters, we were violating six." The system was experiencing overflows and bypassing, new sewer connections were banned, and treatment plant equipment was in disrepair and beyond its useful life.



Tony Wood, superintendent of the town of Osgood (Indiana) Wastewater Treatment Plant

"But I was young, it was a new job, and I welcomed the challenge," Wood says. "I walked in and started cleaning up, delegating tasks, and seeking advice from other operators around the state." It worked. Within two years, Osgood had retained a consultant and had designed plant upgrades. The first major upgrade since 1972 was completed by the end of 1998.

The upgrade replaced the old headworks as well as all the influent and return pumping. An extended air oxidation ditch and new clarifiers were added. Automation and instrumentation were modernized. A new lab and administration building were constructed. Much of the old plant was converted to storage tanks.

SECOND UPGRADE

Next came new sewers and upgraded lift stations. As a result, as of last summer, the utility had seen its longest streak of compliance without a violation — 15 months.

Wood's knowledge of the job improved in those years: "I came into the position from a lab background, but I had a good logistical mindset. I had to educate myself on everything from wiring, controls, diagnostics, and land application requirements to technical things like materials on mechanical joints, maintenance and safety. I didn't know everything, but as time went on, I built a good foundation."

To finance the upgrade, the town raised rates and Wood helped identify critical needs as the town and its consultant successfully petitioned for rural development grant money. "We had no choice," says Wood, a past president of the Southern Indiana Operators Association. "We had compliance issues, and that state mandated what we needed to do."



Tony Wood, Osgood, Indiana

POSITIONS: | **Superintendent, town of Osgood Wastewater Treatment Plant; operator, Friendship Regional Sewer District**

EXPERIENCE: | **25 years as superintendent at Osgood; 18 years as operator at Friendship**

DUTIES: | **Treatment plant and sewer system management, operations, performance, budget**

EDUCATION: | **Milan (Indiana) High School**

CERTIFICATIONS: | **Class III municipal and Class B industrial wastewater licenses**

GOALS: | **Earn a Class C industrial license**

GPS COORDINATES: | **Latitude: 39°8'15.62"N; longitude: 85°16'55.17"W**

Obtaining grant money has turned out to be one of Wood's strong suits and is a good indicator of his approach to problems. "There's lots of grant money out there," he says. "You wouldn't ordinarily consider wastewater operators as grant writers, but I take pride in writing grant applications." Grants are available through the state's riverboat casino funds, community foundations and trusts, and state and association sources.

For both utilities he represents, he has obtained \$175,000 to \$200,000 in small grants for treatment equipment, lab equipment, new samplers, safety equipment and even a lawn mower. Osgood's new lab was built with grant money. "In the early 2000s, grants helped us with our distribution projects and helped us buy big equipment like trucks and a backhoe," Wood says. "Grants have really helped us with infrastructure and have kept us from raising rates."

Tony Wood's grant-writing skills have helped the Osgood plant secure funds for needed upgrades and equipment.

“There's lots of grant money out there. You wouldn't ordinarily consider wastewater operators as grant writers, but I take pride in writing grant applications.”

TONY WOOD

SUCCESS SECRET

The secret to grant-writing success? "You must have a valid need, and you need to be able to sell it." Integrity counts: "You need to mean what you say and say what you mean. You need to put your request in your own words so the grantors can put themselves in your shoes."

Grants have also underwritten the weather stations at the Osgood and Friendship plants, and these are Wood's pride and joy. "Weather is one of the key components of data information for wastewater plant operators. Most utilities have I&I (inflow & infiltration) issues. With good precipitation information, we can see what's going on, where the flows are coming from, and which way they're trending. We know when to act, when to respond."

“Our operators have a lot to do, so it’s important that our town board consistently has our backs. They allow you to go out and get what we need to do a good job.”

TONY WOOD

At both the Osgood and Friendship plants, a Weather Pro Plus system (Davis’ WeatherLink) tracks barometric pressure, UV radiation, wind speed and direction, temperature, the rate of rainfall, and collective rainfall. Stream flow is monitored by an ultrasonic solar-powered flowmeter. The data dumps into a data logger, goes to the WeatherLink system server and then is transmitted to the SCADA system in the wastewater plant control room.

The data is shared with others, serving as an effective public information link with the general population. “I can get water flows and see when it hits flood stage,” Wood says. “If there’s water on the road, public service can use the information.”

The National Weather Service uses the data to model stream flow. Wood is working with the Ripley County Emergency Management Agency and Laughery Valley Watershed, using weather stations to obtain digital stream flow information for discharges. The public has access to the weather information, since it’s listed in the local news media: “It’s good public relations.”

TECH TOOLS

During his career, Wood has developed an appreciation for technology: “I started in 1992, and I have worked through three generations of technology. When I came in, there was a certain way of doing things. Then with our first plant upgrade, we used different technologies. And now, new technology continues to change the industry for the better. I didn’t have a computer when I started this job. Now, I have a desktop, a SCADA system, and a Microsoft Pro for GIS and our distribution system.”

Wood says technology enables plants like his to minimize time spent on specific tasks and limit unnecessary overtime. “We use variable-frequency drives to database our processes,” he says. “Technology helps us tweak our air and chemical feed rates and do our own GIS mapping.” With technology, he says, departments like water, gas and power can cross-train, use fewer people, and work smarter.

Technology also makes wastewater treatment a good field for young people, Wood believes. He has seen wastewater positions change from laborer level to systems manager. “We have numerous and very specialized positions now,” he says. Plus, wastewater experience can help people connect with engineering firms, manufacturers, regulatory agencies and specialty companies.

COMMUNITY CONNECTION

“If you don’t necessarily like the office environment, if you like to get out in the field, if you like challenges, if you like technology, this is a great field to be in. It’s wide open.” While hard work, new technology, and a willingness to learn and adapt have helped Wood become the operator he is today, he is quick to acknowledge the importance of community support.

“Over the years, our town council has been good to us,” he says. “We are blessed. Our operators have a lot to do, so it’s important that our town board consistently has our backs. They allow you to go out and get what we need to do a good job.” He adds that the support of his community and town board have enabled him to become a better operator.



Wood came into his position at the Osgood plant with a lab background, and soon began educating himself on everything from wiring to land application requirements.

WORKING OVERTIME

As if Tony Wood didn’t have enough to do managing the wastewater treatment operation at Osgood, he has taken on operations of the wastewater system for the neighboring village of Friendship.

“I live about 3 1/2 miles from the village,” Wood says. “It’s a scenic area, and the National Muzzle Loading Rifle Association is based there. There are thousands of contests there all year long and a flea market and campgrounds.”

The community maintains a small, two-cell lagoon system with 20 pump stations and gravity sewers. “They needed somebody to look after the plant,” Wood says. “I go down there every day after my shift at Osgood and read the gauges, take care of groundskeeping, maintain the parts inventory, do preventive things and handle the compliance.”

He undertakes some of the tasks daily, some monthly and some seasonally. So how does he get away for vacation? “I have volunteers who can do some of the tasks for me. I have certain people available to back me up. It’s a neighborhood thing.”

The feeling is mutual. Tammy Wilhoit, town clerk-treasurer, calls Wood a dedicated team player who is knowledgeable and easy to work with: “He’s very determined. He’s good at going after grant money, and when he sees something that would be an asset for his department or for the town, he goes after it. He’s an all-around go-getter.” **tpo**

Maximizing Reliability in High-Speed Turbo Blowers

WHEN CHOOSING BLOWER TECHNOLOGY, CONSIDER NOT JUST THE DESIGN OF THE MACHINE, BUT ALSO THE CONDITIONS UNDER WHICH IT MUST OPERATE

By Paul Petersen

For the past decade, high-speed turbo blowers have helped many wastewater treatment facilities significantly increase aeration efficiency and drive down energy costs.

At the same time, as some plants have reported blower failures causing treatment outages and discharge permit violations, some engineers and operators have come to consider the technology unreliable. In reality, the majority of treatment plants using turbo blowers have operated them successfully and enjoyed years of trouble-free service.

Why do some plants operate well with turbo blowers and others not? The answers lie in the blower design, blower operating conditions and plant environmental conditions.

DESIGN DIFFERENCES

Turbo blowers are popular for their high efficiency, small footprint and low maintenance. They deliver more air per square foot, reducing aeration system installation costs and the plant's carbon footprint. They also need minimal preventive maintenance, mainly requiring operators to simply change the air filter. All these factors contribute to low life-cycle cost.

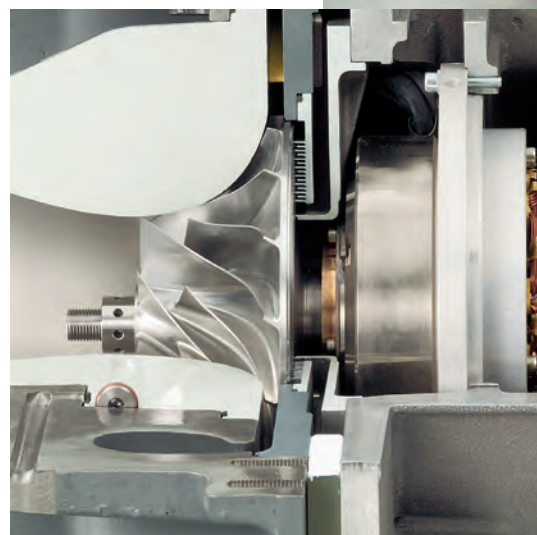
Several design differences can affect turbo blower reliability and operating costs including the type of bearings used, how the motor is cooled, and how the blow-off safety valve is implemented.

BEARING DESIGN

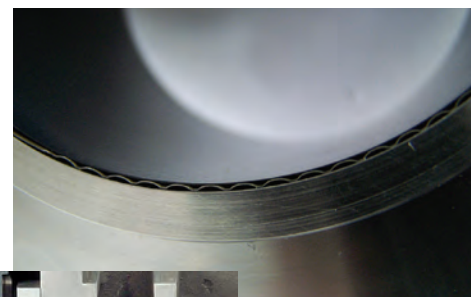
In general, the largest design difference between turbo blowers lies in bearing design.

Airfoil bearing blowers are simple in design, with no bearing controllers or sensors, and its capital cost is relatively low. They work on a principle similar to journal bearings in car engines in that a viscous fluid is pumped into the clearance between the bearing housing and the rotating shaft. In this case, the viscous fluid is air, which creates a wedge that lifts the shaft off the fixed portion of the bearing. As long as the blower operates at constant pressure and constant flow, there should be no friction. Issues can arise during operation at low flow or high pressure, or in the presence of corrosive gases in the airstream or excessive heat.

Magnetic bearings have a more advanced design with electromagnetic coil packs that surround the steel shaft of the blower and motor, exerting a pull on the shaft. A high-frequency controller senses where the shaft is located relative to the desired position and adjusts power to the coil packs. If the shaft moves out of alignment, the controller sends more current to one side of the bearing to pull the shaft back into position. This allows the shaft to continuously rotate in its mass center. Provisions are made to maintain bearing levitation in case of a power failure. Magnetic bearings allow the machine



ABOVE: Close-up view of a third-generation airfoil bearing and bearing housing. LEFT: Cutaway view of a turbo blower, including copper coils of magnetic bearings.



to tightly control impeller clearances and provide a dynamic response to choke and surge conditions, protecting the blower and motor.

MOTOR COOLING

Turbo blowers can use either permanent magnet or induction squirrel cage motors. Regardless of type, the motor is cooled using air or water.

Air-cooled motors can use either passive or forced air cooling. In a passive system, intake air is drawn across the motor windings before it enters the blower intake for compression. In a forced air system, intake air is drawn using an electric or shaft-mounted fan in the blower enclosure.

Air-cooled motors need proper maintenance to keep foreign particles, corrosive gasses, or rust from fouling the cooling channels, motor windings, and blower bearings.

Water-cooled motors pass water through a cooling jacket around the motor. More robust designs include a thermal-regulating valve that controls the cooling water temperature. The consistent temperature helps control thermal expansion of the motor and blower shaft, while the sensors monitor the condition of the cooling system to maintain efficiency and reliability. Effective control and monitoring reduces wear and increases the lifetime of the motor.

BLOW-OFF VALVES

Blow-off valves protect centrifugal blowers against surge, which occurs when the blower cannot convert enough kinetic energy (airflow) into potential energy (pressure) to overcome the system back pressure. This can hap-

pen due to increased header pressure or decreasing flow beyond the blower minimum design speed. When surge occurs, the blower shaft moves around, potentially causing contact between the shaft and bearings. A blow-off valve vents the pressure in the package to prevent this contact.

There are different types of blow-off valves; the style of valve used is different for each manufacturer.

Solenoid blow-off valves are the most common type used in airfoil bearing blower packages. These are simple, inexpensive and readily available. However, solenoid valves don't offer the same level of protection as other blow-off valves used in the high-speed turbo blower market.

Fast-acting blow-off valves are also used in airfoil bearing blower packages. Each time the shaft contacts the bearing, there is a risk of bearing deformation, which leads to machine failure. Airfoil bearings use special coatings that experience a small amount of wear each time the shaft contacts the bearing. Due to the delicate nature of airfoil bearings, the blow-off valve must react immediately to a surge condition. That is why fast-acting blow-off valves must fully open in milliseconds.

Modulating blow-off valves provide highly reliable service in magnetic bearing turbo blower designs. Since the magnetic bearing controller can monitor and control the blower shaft position, a fast-acting valve is not needed. When the blower controller senses that the blower is operating near a surge condition, a signal is sent to the drive to speed up and open the modulating valve. This continues until the valve is fully open or until the controller senses that the blower is no longer in surge.

ENVIRONMENTAL CONDITIONS

There are many environmental considerations to make when installing high-speed turbo blowers in wastewater treatment plants. Poor power quality, contaminants in the atmosphere, and incorrect piping and ventilation can all result in poor reliability and performance.

Power quality

If the power supply to the blower package is of poor quality, the blower will have poor reliability. The sensitivity of high-frequency electronics used in turbo blowers can heighten the risk of poor power quality, leading to shutdowns or shorter life for motors, VFDs, tuning reactors and sine filters. Problems can arise when the supply voltage is greater or less than the VFD-rated voltage, or when there is harmonic interference from nearby pumps, blowers and non-shielded sensor cables.

Atmospheric contaminants

For reliable turbo blower operation, the surrounding environment must be free of contaminants, including particles and corrosive gases. If the blower process air intake contains hydrogen sulfide (H₂S) — such as from an anaerobic digester — then the impellers, air-cooled motors, airfoil bearings, and copper in the magnetic blower bearings can experience corrosion. Cooling air intake containing H₂S can corrode the blower control panel, VFD, tuning reactor, sine filter and air-cooled motor windings, ultimately leading to blower failure.

In the Northern states, piles of road salt may be stored on municipal lots near treatment plants, and salt particles can find their way into the air. Salt particles combined with water vapor will rust wetted ferrous parts and corrode wetted aluminum parts, affecting blower reliability and shortening maintenance intervals.

Metal particles from nearby smelters, forgers, recycling plants or scrapyards can shorten the life of air-cooled motors, cause pitting of blower impellers, or cause failure of airfoil bearings. In addition, metal particles in

the blower cooling system can result in short-circuits when deposited on the blower control panel, VFD, tuning reactor, sine filter and air-cooled motor windings.

Piping and ventilation

Incorrect piping and ventilation of blower cooling and process air can create excess heat or pressure, reducing performance or causing failure. Process air can be drawn from inside the blower room or outside the building. When designing inlet piping and ducting, it is important to abide by the manufacturer's recommended intake headloss. Excessive bends or elbows and sections with reduced cross-sectional area will increase pressure drop on the blower inlet.

Common ducting of multiple blower inlets — a frequent practice — causes a running blower to pull vacuum on the inlet of a nonrunning blower, creating backflow in the nonrunning machine and increasing the differential pressure of the running machine. Turbo blowers are designed to operate at a differential pressure that is the sum of intake pressure loss plus discharge pressure head. When excessive pressure drop is introduced at the blower inlet, surge will occur when the blower can no longer produce enough discharge pressure to overcome the system head.

The same issues are common with discharge piping. Excessive elbows; reduced cross-sectional areas; and poorly maintained check valves, isolation valves, and diffuser membranes can all lead to excessive piping pressure loss. When piping is incorrectly installed, system pressure can exceed the blower design point, resulting in surge and reducing the blower life.

OPERATING CONDITIONS

In general, high-speed turbo blowers are best suited for secondary treatment aeration. Based on your application, find the general air requirements and recommended blower technology in the table below.

Recommended high-speed turbo blower technologies by application		
Treatment method	Air requirements	Recommended blower technology
Conventional activated sludge	Fixed pressure and variable flow	Airfoil or magnetic bearing
Aerated lagoon	Slightly varying pressure and flow	Airfoil or magnetic bearing
Sequencing batch reactor	Greatly varying pressure and flow	Magnetic bearing only
Moving bed biological reactor	High flow and variable pressure	Airfoil or magnetic bearing
Membrane bioreactor	Fixed pressure and variable flow with higher pressure purge condition	Airfoil or magnetic bearing with compressor for filter scour
Anaerobic digester	Boosting gas from slight vacuum to positive pressure	High-speed turbo blower not recommended

CONCLUSION

Reliable high-speed turbo blower usage in wastewater treatment plants depends on appropriate blower package design and proper operating and environmental conditions. For the highest level of reliability and efficiency, engineers and operators should do the following:

- Make sure the blower is suited to the plant application.
- Verify that the blower package uses the correct bearings, cooling system and safety valve to be robust and durable in the application.
- Check that the installation has a good-quality power supply, is kept free from airborne contaminants, and has the proper piping and ventilation installed.

ABOUT THE AUTHOR

Paul Petersen is a regional sales manager for blowers and low-pressure compressors with Atlas Copco Compressors, a provider of compressors, vacuum solutions and air treatment systems. He can be reached at paul.petersen@us.atlascopco.com.

tpo

More Than Rehab

A STUDENT-DESIGNED MURAL IN ILLINOIS ON DECATUR'S ABOVE-GROUND WATER RESERVOIR BECOMES A POINT OF VISUAL INTEREST ALONG A BUSY HIGHWAY

By Jeff Smith

It took nearly 1,000 gallons of light beige paint to spruce up the 7.5-million-gallon reservoir at the South Water Treatment Plant in Decatur, Illinois. But it was the 40 gallons of contrasting admiral blue paint that turned the structure into an attention-getting, aquarium-looking landmark that has become part of the city's public art program.

A 650-linear-foot mural painted on the tank shows 48 fish, 121 water bubbles and two huge blue herons that complement the aquatic scene designed by an art student at a nearby university. "The tank is on our plant site, which is near a busy highway, so a lot of people get to see it every day," says Jerry Stevens, P.E., water production operations supervisor.

MAJOR REHABILITATION

The city contracted with DN Tanks in 2016 to inspect, clean and coat the tank they built in 1987. Stevens thought that since it is in a high-visibility area and the city's downtown improvement project includes murals on buildings, the water treatment plant could beautify the tank.

A committee of Stevens, the mayor, a city council member, the city arts council president, the water department manager and the city manager collaborated to hold a contest and produce a mural with a wildlife and water theme including the Sangamon River, the plant's water source. The winning design was selected from five submitted by the graphic arts department at Millikin University. Those five had been winnowed down from 15 original submissions. The winning student, senior Sarah Suits, received a \$500 stipend.

After the tank inspection, a 3,500 psi power washer prepared the surface for spray application of a special concrete paint. The contrasting blue wildlife images were laser-light projected onto the tank from the ground and then outlined by a painter in a truck-mounted bucket who filled in the images with roller and brush. A protective final clear coat formulated

to retard dirt and ease washing completed the project, which took nearly seven months.

FITTING RIGHT IN

"I've heard a lot of people say they like the outcome, and I have not heard anything negative, so I guess it was a success," Stevens says. "We think it's pretty neat." The mural theme is fitting for the 36 mgd water plant site and is consistent with other murals in Decatur.

A mural on one downtown building shows George Halas, the coach of the Decatur Staleys semipro football team that became the Chicago Bears. The Staleys were formed by A.E. Staley, founder of a corn processing firm that bore his name and is now known as Tate & Lyle.

“I’ve heard a lot of people say they like the outcome, and I have not heard anything negative, so I guess it was a success. We think it’s pretty neat.”

JERRY STEVENS, P.E.

A 5-million-gallon reservoir near the Tate & Lyle plant site on Decatur's east side was also inspected and coated by DN Tanks, but without a mural. It serves another large water customer, corn processor Archer Daniels Midland. Together, the two companies use more than 60 percent of water production; that stabilizes pumping requirements and eliminates the effects of the summer production swings many water utilities experience.

"You often see murals on elevated water towers, but on a ground storage reservoir, it's kind of unique," Stevens says. "It was fun to do, especially since we could include other members of the city and community." **tpo**

An aerial view of the finished mural, featuring a great blue heron.

PHOTO COURTESY OF NORTHERN DIVERS



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Data Driven

WATER AND WASTEWATER UTILITIES INCREASINGLY RELY ON DATA FROM MULTIPLE DEVICES. EFFECTIVE ANALYSIS AND RELIABILITY HELP MAXIMIZE EFFICIENCY, SAFETY AND COMPLIANCE.

By Ted J. Rulseh

In years past, operators ran water and wastewater treatment plants based largely on experience, intuition, manual measurements, sights, sounds and smells.

Today, data increasingly drives decisions, often automatically by way of feedback loops through programmable logic controllers, SCADA systems and software. In fact, utility performance and efficiency often rise or fall in direct proportion to the quality of data and its analysis.

John Fryer has worked for more than three decades in the computer, telecommunications and networking industries. Today, he is senior director of industry solutions with Stratus Technologies, a company that specializes in fault-tolerant computer technology — equipment that keeps critical software applications running even if a hardware component fails.

Fryer talked about the importance of data analytics and data reliability in an interview with *Treatment Plant Operator*.

tpo: Why is it important for water and wastewater utilities to use data and analytics more extensively?

Fryer: Cost pressures are always there. It's the old story of having to do more with less, being more efficient. On the water side, for example, we have lived through droughts in California and in the Northeast — where I live — for the past two to three years. When it comes to water conservation and detecting leaks in an overall system, the ability to collect data from various points in the network and bring that together and analyze it can be extremely valuable.

“Today, sensory equipment can be installed on pumps, or modern pumps come with it built in. ... The analytics can tell you when you actually need to do maintenance on that equipment. In this way, you optimize your resources and time and save money.”

JOHN FRYER

tpo: What would be an example of this concept applied to the treatment plant side?

Fryer: A fairly simple example is chemical treatment — making sure you're adding the correct amount of various chemicals and additives. There are techniques to enable operators to do this automatically on a more real-time basis and get ahead of the curve in making adjustments. If you have the right analytics, you can take a more advanced approach.

tpo: How can utilities manage the increasing volume of data from their systems?

Fryer: Facility managers are looking to add sensory capabilities to pull more data in. Modern control systems collect a great deal more data than systems that are 15 to 20 years old. They may not need all that data to run the control functions day to day, but all the data that gets collected can be very valuable in terms of helping run other parts of the system. But, you need to store that data properly or its value disappears. Data is really a valuable commodity, and the first priority is to make sure it is protected.

tpo: What are some examples of how data can have value beyond its most basic purpose?

Fryer: Consider smart metering on a water system. Instead of having to run around and manually collect the meter data, it comes back automatically to the water department where it's used to calculate the bills. But they can also use that data to detect anomalous use by customers. Over time, you can build individual customer usage profiles so that, for example, you could detect that Joe Smith is suddenly using a lot more water than normal — maybe he has a leak and doesn't know it because he's away on vacation. Or in a drought situation, they could detect when people are using water at 3 o'clock in the morning when they shouldn't be.

tpo: What other functions can data and analytics serve?

Fryer: Data analytics can help ensure compliance and safety. Events like water contamination and sewage escaping into water sources can be fairly insidious: A problem starts very small and is not detected, and then suddenly people get sick and

that's how you find out. Today, rather than send water samples to a lab and wait to get the results, utilities can automatically collect and analyze samples and store the information in a database. That makes it possible to track parameters as they change over time. The analytics can be set to trigger a point that says, for example, that bacteria have gone above a certain level — one much lower than where it would really cause a problem. It enables operators to be much more proactive.



John Fryer

tpo: Can data analytics be used to improve system maintenance?

Fryer: Yes. In a water and wastewater network, you have mechanical equipment, much of which can be in remote locations. If, for example, a well pump fails, that can have a significant detrimental impact. Today, sensory equipment can be installed on pumps, or modern pumps come with it built in. Temperature, vibration, pressure, flow rates — all these parameters can be put into an analytics engine. The analytics can tell you when you actually need to do maintenance on that equipment. In this way, you optimize resources and time and save money.

“There is no point investing in sophisticated analytics without the back-end infrastructure to support it properly.”

JOHN FRYER

tpo: Where does the question of data reliability come in?

Fryer: Many SCADA systems in the field are very old, and when they fail, people have to scramble to get them fixed. Information technology assistance may not be readily available, especially for smaller cities, and they have to go into a manual operation mode until repairs are made. There is no point investing in sophisticated analytics without the back-end infrastructure to support it properly.

tpo: What is the solution to deploying data collection and analytics reliably?

Fryer: The solution is a fault-tolerant computer server. It looks and operates just like a normal server, except that it just doesn't fail. It provides high availability in a single box — without the need for multiple servers, cables and a storage area network — plus the IT skills to get it all going. It has predictive maintenance capabilities built in. It ensures that all their applications will keep running, while the hardware takes care of itself and keeps all the data they're collecting. If they are running applications and there is a problem with the hardware, the machine continues to operate in the presence of a failure. The applications are not aware that anything has happened.

tpo: What would you tell to the operators who feel they don't have the expertise to take care of this kind of system?

Fryer: It's not a question of what kind of degree an operator has. What's needed is a system that will reliably run the applications and a reliable partner at the other end of the phone to provide support. It's a simple matter to train operators to hot-swap parts without having any IT expertise.

tpo: What would you say about the cost of investing in these analytics technologies?

Fryer: It does sound expensive, but the fact is utilities don't have to do it all at once. For example, a smart metering system can be implemented neighborhood by neighborhood, over time. It's the same on the predictive maintenance side. They don't have to deploy a solution across their entire infrastructure. They can pick the most sensitive points in the network, apply technology to that, and see what results come back. **tpo**

industry news

Howden acquires Siemens companies

Howden Group announced it acquired Siemens Turbomachinery Equipment businesses in Europe and China along with a Siemens Energy business in America. Established brands that were acquired include Turblex in the U.S. as well as HV-TURBO and Kuhnle, Kopp & Kausch in Europe. In total, all of the Howden Turbo Technologies brands represent a combined 500-plus years of experience.

Bockhorst appointed chief operating officer of Badger Meter

Badger Meter announced it has appointed Kenneth C. Bockhorst to the newly created position of senior vice president and chief operating officer. He brings more than 20 years' experience to global operations management, most recently serving as executive vice president of the energy segment of Actuant Corp.



Kenneth C. Bockhorst

U.S. Water acquired Tonka Water

Tonka Water has joined the U.S. Water family, allowing it to expand its integrated water treatment offerings and applications. U.S. Water, with headquarters in St. Michael, Minnesota, serves a mix of more than 4,800 industrial customers.

JWC Environmental received Water Environment Federation Innovative Technology Award

JWC Environmental was awarded the Innovative Technology Award by the Water Environment Federation for its Wipes Ready technologies. The grinder technology, available exclusively on the company's Muffin Monster and Channel Monster products, helps combat the problems caused by disposable wipes products.

Singer added to sales team with two new hires

Singer has added Roger Hahn to the position of western USA sales manager and Bryan Cole as the central USA sales manager. Hahn brings more than 30 years of water industry sales experience, and Cole brings 12 years of technical sales experience in the valve and manufacturing industry. **tpo**



Roger Hahn



Bryan Cole



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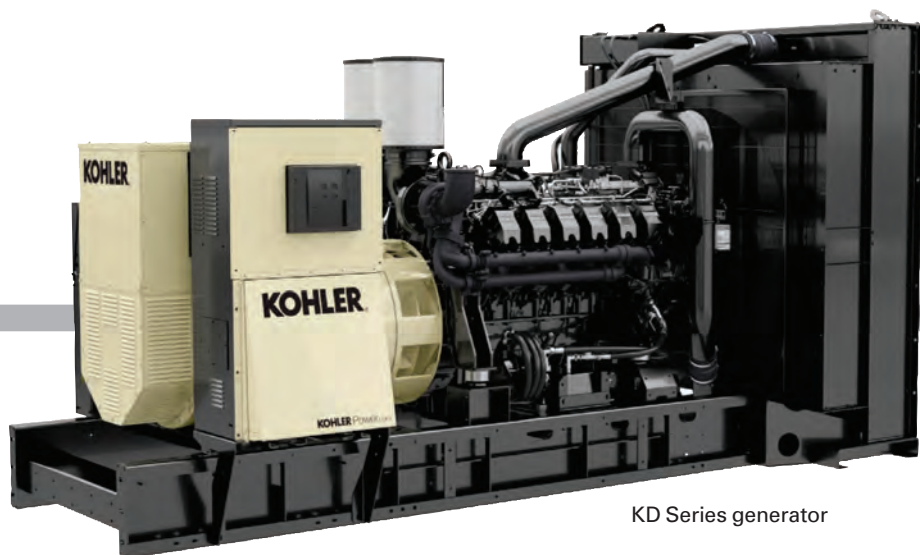


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KD Series generator



KD Series engine

A Step Up in Standby

A NEW SERIES OF LARGE-CAPACITY DIESEL GENERATOR SETS INCLUDES INNOVATIONS DESIGNED TO DELIVER HIGH PERFORMANCE AND EFFICIENCY IN COMPACT FOOTPRINTS

By Ted J. Rulseh

Diesel standby generator sets are basic equipment in water and wastewater treatment plants. They're designed to start immediately, ramp up quickly to full load, and power essential plant equipment until main utility power is restored.

Now, Kohler Power Systems has introduced KD Series diesel gensets, designed from the ground up to deliver standby power in compact and highly efficient packages from 800 kW to 4 MW. The units are powered by Kohler G-Drive diesel engines with fuel injection and engine management systems engineered to optimize performance.

The engines run smoothly and quietly with low vibration even under extreme operating conditions, extending service life. The common rail direct fuel injection system generates high injection pressures to maximize efficiency. This enables high power density and kilowatt displacement in packages that deliver high fuel economy.

Jim Rummel, senior product manager for large diesel, and Steve Zielke, marketing manager – vertical segments, talked about the KD Series in an interview with *Treatment Plant Operator*.

tpo: What makes this generator set series a good choice for standby power?

Rummel: Kohler has been in the generator business since 1920. We are one of four companies in the world that build their own engines and

gensets at 2 MW and above, and we're the only one who builds our own engines specifically for generators. The development of this series has gone on for seven years, and we've been able to focus on the latest technologies and design techniques to build a world-class product.

tpo: What specific advantage does this series offer to water and wastewater facilities?

Rummel: Because of the large startup loads these facilities get from pumps and other equipment, we created a product line with very strong motor

“The development of this series has gone on for seven years, and we've been able to focus on the latest technologies and design techniques to build a world-class product.”

JIM RUMMEL

starting capabilities and very quick startup times. All KD Series generators comply with the international ISO 8528-5 Class G3 requirements for transient load performance. Because of how quickly they adapt to load, users can do startup and restore operations very quickly.

tpo: How rapidly can these units accept load in an emergency?

Rummel: The KD Series surpasses the NFPA requirement for 10-second

startup time to full load. The KD1000, with a 1,000 kW capacity that is a sweet spot for many wastewater applications, reaches 90 percent of rated voltage and frequency in 6.2 seconds from cold start. If it's already running and idling, it completes the zero to 100 percent load step significantly faster than that.

tpo: What are some of the key design innovations in this product line?

Rummel: Our common rail system reaches injection pressures of over 2,200 bar. Much of the efficiency starts there. Because of this process, we see low fuel consumption, high power density, and high kW displacement coming together to create an efficient package. Our system is also unique in that we don't use the fuel to cool the engine. That means when designing day tanks and fuel delivery systems, you don't need to incorporate chillers or oversize the day tank to account for warm fuel that's being returned.

tpo: What else about this product have customers responded to favorably?

Rummel: Engineers have been excited about our fuel lift. The KD1000, for example, reaches a fuel lift of 14 feet. That means more flexibility in where they can put the day tank without needing a booster station. So for example, if the genset sits above a day tank that is narrow and deep, there is no worry about the engine being able to suck out fuel when that tank gets low.

tpo: What is the benefit of high kW displacement in these engines?

Rummel: The KD1000 displacement is 27 liters; most other products in the market at that capacity are 30 to 33 liters or above. The result is a smaller footprint, less weight, less steel, fewer isolation pads and easier service. Because of this and other efficiencies built-in, we are very competitively priced even with all the innovation this series contains.

tpo: How are these generator sets controlled?

Rummel: The engines incorporate the Kohler Diagnostic (KODIA) System, which monitors all functions. It communicates seamlessly with the genset controller, which is also the user interface. Users can download data on anything happening with the engine and genset itself using a full-color display screen. We also supply switchgear and automatic transfer switches, or ATS. For standby, users can have a break-before-make system, where the utility power goes out and then the generator starts, or a make-before-break system, where the ATS senses that the utility is about to lose power and starts the genset ahead of it.

tpo: Do you envision these gensets being used for some form of load management or demand response in conjunction with utilities?

Rummel: Absolutely. For more complex systems that involve paralleling multiple units and integrating with the utility, we offer total system integration.

Zielke: We have extensive experience in the wastewater industry with our Engineering Solutions department and our ability to integrate entire systems. That is coupled with our distribution network. In the U.S. alone, we've installed hundreds of large gensets in wastewater facilities.

“We have extensive experience in the wastewater industry with our Engineering Solutions department and our ability to integrate entire systems. In the U.S. alone, we've installed hundreds of large gensets in wastewater facilities.”

STEVE ZIELKE

tpo: What has been the response from customers and prospects since this series was introduced?

Rummel: Over several months, we held local events where our distributors had a generator set available for demonstrations. We invited many consulting engineers and people from the wastewater industry. The customer feedback has been really positive. We had a sales plan for the first 12 months after release, and we reached that plan within six months. This series has been accepted at a rate twice as fast as we projected. The customers see the advantages. **tpo**



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1



2

1. BLUE-WHITE INDUSTRIES MICRO-FLO

The Micro-Flo flow verification system from Blue-White Industries is designed to be used with metering pumps to provide accurate flow measurement and accumulated flow data. It can be installed directly into a pump's discharge tubing, inline in the system after the pump or by mounting it to a panel. If the chemical should fail to inject, the pump will stop and an alarm relay will close, allowing for remote alarm indication or initiation of a backup injector pump. It is factory calibrated, so there's nothing to program and the total reset function can be disabled. **714/893-8529; www.blue-white.com**

2. OR-TEC'S BLUE WHALE MICRO BAR SCREEN

OR-TEC's Blue Whale micro bar screen removes wipes, rags, plastics, hair and other stringy material at the headworks. The 2 mm multirake screen is self-cleaning and is guaranteed not to bind. It uses a parallel array of wedge-sectioned bars with even spaces to form the screen face. The bars have only two contact points where material can block, so solids that pass through the two contact points can't become clogged between the bars. A cleaning rake with slotted teeth penetrates past the opening on the bars, cleaning the array and preventing clogging or blinding of the screen. **216/475-5225; www.or-tec.com tpo**

For FREE information on these products, check the box(es) below:

- ☐ 1. Blue-White Industries Micro-Flo flow verification system
- ☐ 2. OR-TEC's Blue Whale micro bar screen
- ☐ Multilog LX-2 data logger from Fluid Conservation Systems
- ☐ CA80TP phosphorus analyzer from Endress+Hauser
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water: product spotlight

Remote telemetry eliminates site visits

By Craig Mandli

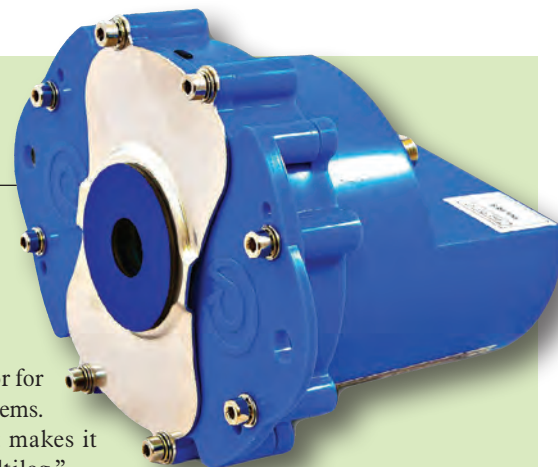
Making site visits to collect data from the water monitoring equipment in your distribution network is often a tedious process. Those lost hours could be more valuably spent on other tasks, but data collection is an important component to keeping the network operating to its full potential. Thankfully, the next-generation **Multilog LX-2** from **Fluid Conservation Systems** offers remote 3G telemetry that's designed to eliminate those water monitoring site visits.

The unit is a battery-powered, multiple-channel data logger for flow and pressure monitoring in water distribution networks. The device builds on the monitoring capabilities of its predecessor, the Multilog, with the addition of remote data transfer and upgraded processing abilities.

Designed to fit inside very shallow Atplax box installations, the logger is ideal for many applications, including logging key customers and monitoring flow and/or pressure in a district or zone to assess demand, leakage and pressure conformance. It utilizes GPRS technology to provide rapid transmission at low cost, enabling data to be retrieved more frequently for analysis and response.

"It's a good fit for applications that require pressure and flow monitoring, trunk main monitoring for pressure and noise, CSO, flow, level, pump run time, and rain event monitoring," says Vincent Favre, the North

Multilog LX-2 from Fluid Conservation Systems



American sales director for Fluid Conservation Systems. "Its versatility is what makes it an upgrade on the Multilog."

In addition to digital and analog inputs, the Multilog LX-2 has a serial input that enables it to connect easily to a wide range of leak noise and ultrasonic level sensors and water meters, including the SonicSens ultrasonic level sensor, Permalog+ leak noise loggers, and Modbus-compatible sensors and meters. Multiple recording options can capture a mixture of minimum, maximum, average or spot values in each sample interval. Resulting data can be transferred wirelessly to the Fluid Conservation Systems secure DataGate web-based portal and easily accessed from any internet-enabled device. "Its unique range of inputs offers a nice value for the user," Favre says.

A 5-year battery life along with remote programming and firmware upgrades eliminate the need for expensive and time-consuming site visits. It is IP-68 rated fully waterproof, having been tested to a depth of 10 meters over a 24-hour period. "The feedback from customers using it has been excellent," Favre says. "We're very excited about it." **800/531-5465; www.fluidconservation.com**

wastewater: product spotlight

Real-time phosphorus analysis

By Craig Mandli

Measuring the level of phosphorus in your effluent is essential to making sure your plant stays within discharge regulations. In most industrial and water and wastewater plants, phosphorus measurements require that a technician pull a sample manually and take it to a lab for analysis. However, with the **CA80TP** from **Endress+Hauser**, the measurement is performed online — as accurately as a lab analyzer — while saving time.

“The CA80TP provides laboratory-quality results for total phosphorus on a routine basis,” says Steve Smith, senior product marketing manager, liquid analysis for Endress+Hauser. “Its low reagent consumption, automated cleaning and calibration, and ease of maintenance and use all add up to a low cost of ownership. It allows operators to obtain more real-time results rather than waiting for time-consuming lab analysis.”

The CA80TP measures phosphorus in ranges of 0.05 to 10 mg/L, or 0.5 to 50 mg/L. It has two 4-20mA outputs with the option for additional outputs including Modbus RS-485, Modbus TCP, PROFIBUS DP and EtherNet/IP. The 4-20mA outputs transmit the phosphorus measurement value. The other outputs can be used to transmit the process variable, plus status and diagnostic information.

“The system is used to monitor influent phosphorus loads to the wastewater plant, providing valuable feedforward data to the treatment process,” Smith says. “Even more important is the application of the CA80TP in final effluent monitoring, with documented analysis results that ensure discharge limits are being met.”

To determine total phosphorus, a sample must be digested. Samples are drawn from the process using a suction strainer or can be taken from a bypass piping system. A precise sample volume is digested at high temperature with a digestion reagent. An optical dosing unit, used to dose sample and reagents, uses a redundant light barrier for a high level of reliability, guaranteeing precise and reproducible results from extremely small volumes of reagent. The temperature in the reaction vessel is kept constant to ensure complete digestion takes place within a short period of time.

“The CA80TP is a perfect fit for wastewater treatment systems because the product was specifically designed for this market and their need to measure total phosphorus in a timely manner directly at the process,” Smith says. “The feedback we have received is extremely positive. Field sites are proving that this analyzer is producing lab-quality results on a more frequent basis than relying on a lab.” 888/363-7377; www.us.endress.com



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people/awards

The Water Environment Federation announced its 2017 WEF Fellows recipients:

- **Eleanor Allen**, Water For People, Denver.
- **Rajendra Bhattarai**, Austin (Texas) Water Utility.
- **James Clark**, Black & Veatch, Los Angeles.
- **Paul Dombrowski**, Woodard & Curran, Holyoke, Massachusetts.
- **Al Goodman**, CDM Smith, Pekin, Indiana.
- **April Gu**, Northeastern University, Boston.
- **Ed McCormick**, McCormick Strategic Water Management, Oakland, California.
- **Sandra Ralston**, Consensus LLC, Isle of Palms, South Carolina.
- **Thomas Sigmund**, Green Bay (Wisconsin) Metro Sewerage District.
- **James E. Smith Jr.**, retired emeritus chair, Cincinnati.
- **Daniel Zitomer**, Marquette University, Milwaukee.

The **Laughlin (Nevada) Water Resource Center** received a Peak Performance Gold Award from the National Association of Clean Water Agencies.

For the seventh straight year, the town of **Coupeville, Washington**, received an Outstanding Wastewater Treatment Plant Award from the Washington Department of Ecology.

Dean Grant was hired as public works director for the city of Bowie, Texas.

Marie Prezioso was named executive director of the West Virginia Water Development Authority, which finances construction of local wastewater and water facilities.

Gov. Andrew Cuomo and New York state leaders renamed Riverbank State Park in Harlem after retiring **Assemblyman Herman “Denny” Farrell**. The park sits atop a wastewater treatment facility; Farrell played a critical role in ensuring that the park was built.

The city of **Williston, North Dakota**, dedicated its \$105 million wastewater treatment plant, which can handle a population of 60,000 and can be expanded if necessary.

The **Forest Park Water Treatment Plant** in Chalfont, Pennsylvania, received a five-year Presidents Award from the Partnership for Safe Water.

The **State College Borough Water Authority** received its 10th consecutive 2016 Area-Wide Optimization Award at the Water Works Operators’ Association of Pennsylvania conference.

The **Mankato, Minnesota, Water Treatment Backwash Reclamation Project** was named Project of the Year by the American Public Works Association. The project converted holding water tanks used in the water treatment process to reusable tanks.

The city of Valdosta, Georgia, named **Walter “Darryl” Muse** director of utilities. He brings nearly 25 years’ experience in water and wastewater system operation and management.

Water Treatment Plant 4 in Austin, Texas, was named the Berl Handcox Sr. Water Treatment Plant. The award is named for a former council member and the first African-American to serve on the dais.



OWPCA award winners for Norman, Oklahoma, are shown with department leaders at the association conference. From left are Clayton Herron, plant operator; Bennie Gilmore, plant operator; Sam Drain, OWPCA awards chairman; Scott Lewis, plant operator; Scott Aynes, water plant supervisor; Rachel Croft, laboratory manager; Greg Apperson, plant operator; Andy Bruehl, operations and maintenance technician; and Geri Wellborn, water plant manager.

The city of **Norman** topped eight other cities in the Oklahoma Water Pollution Control Association (OWPCA) annual Water Tasting Contest. The city advances to the next level of competition during the 2018 AWWA conference.

Norman also received several individual OWPCA awards:

- **Robert Travis**, Wastewater Collection System Technician of the year
- **Veon Richmond**, Darcey Award (Wastewater Treatment Plant Operator of the Year)
- **Kellie Seeds**, Wastewater Administrative Technician of the Year
- **Dustin Cozard**, Wastewater Operator Newcomer of the Year
- **Scott Lewis**, Water Plant Maintenance Technician of the Year
- **Andy Bruehl**, Water Plant Maintenance Supervisor of the Year
- **Rachel Croft**, Water Plant Lab Manager of the Year
- **Tommy Martin**, Water Distribution System Maintenance Technician of the Year
- **Bennie Gilmore**, Large Water Well System Operator of the Year
- **Greg Apperson**, Large Water Well System Maintenance Technician of the Year
- **Clayton Herron**, Stapley Award (Water Plant Operator of the Year)
- **Mary Wray**, Water System Administrative Technician of the Year

Ronald Anderson passed his Rhode Island Grade 1 Wastewater Operator Exam, and he is currently an operator in training at the Cranston Water Pollution Control Facility.

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

events

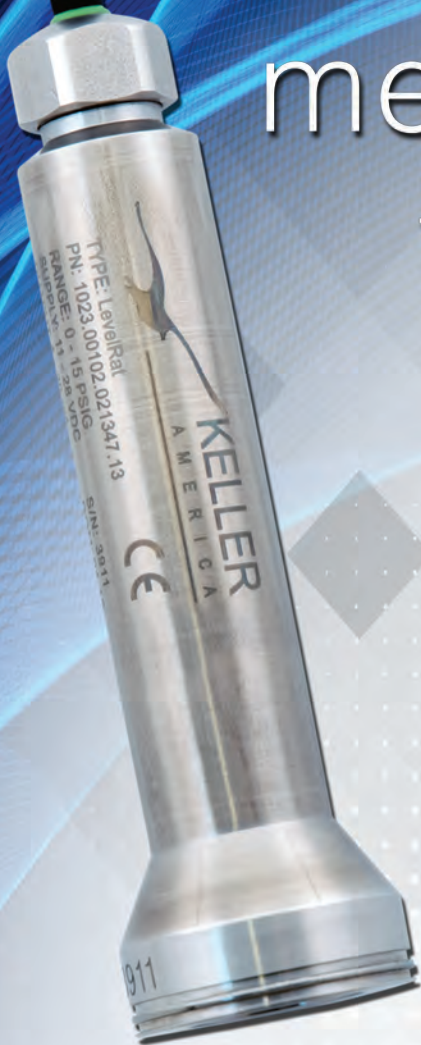
Dec. 1

Waste-to-Energy Workshop: Improving the Feasibility of Small-Scale Digesters and CHP, West Chester University of Pennsylvania. Content will focus on small-scale organic waste-to-energy systems for farms, campuses, food processors, breweries and wastewater treatment plants. Visit www.wcuwastetoenergy.eventbrite.com.

Dec. 3-5

North American Water Loss Conference, Paradise Point Resort, San Diego. Visit www.northamericanwaterloss.org.

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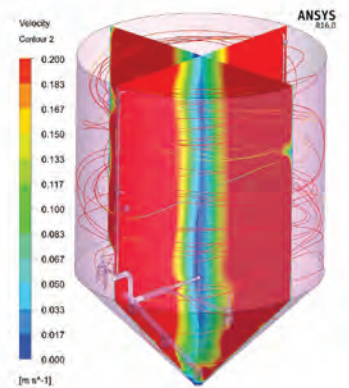
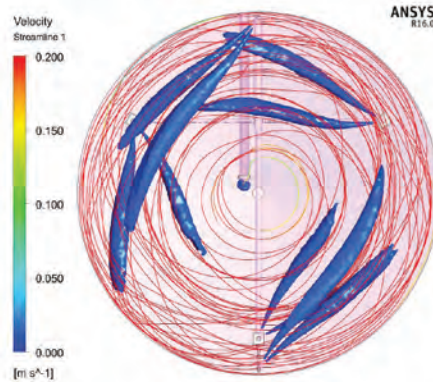
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