

TREATMENT PLANT OPERATOR

# tpo™

DEDICATED TO WASTEWATER & WATER TREATMENT PROFESSIONALS

tpomag.com  
MAY 2016

ANNUAL  
COMPANY  
DIRECTORY  
PAGE 58

Chris Harrison  
Operations Superintendent  
Warsaw, Indiana

## Safety, End to End

**HIDDEN LAKE PLANT'S DESIGN HELPS  
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### on the cover

It's public and employee safety first for Chris Harrison and the team at the Hidden Lake Water Treatment Facility serving Warsaw and Winona Lake, Indiana. The new facilities ensure an adequate supply of safe water, and improvements in disinfection are designed to protect plant operators. (Photography by Amy Voigt)

## top performers:

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### A Productive Journey

An Alabama utility resolves lingering biosolids management issues with a thermal dryer that yields high-value Class A material.

By Ted J. Rulseh

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### Multitasker

Dustan Russum built an award-winning career as 'one-person DPW,' managing water and multiple public works jobs in tiny Frederica, Delaware.

By Jack Powell

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### Efficiency First

Ken Noyes and his team set energy efficiency as a top priority while making systematic upgrades to the Franklin Wastewater Treatment Facility.

By Ted J. Rulseh

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### Safety, End to End

The design of the award-winning Hidden Lake Water Treatment Facility is aimed at safeguarding public health and limiting the risk of work accidents.

By Jim Force

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### Are You Connected?

Alliances with groups working for water quality and environmental protection can help clean-water agencies win friends and further their agendas.

By Ted J. Rulseh, Editor

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### In the Shoes of Those in Need

A Water Walk sponsored by a Southwest Utah water conservancy district highlights week of fun and education around the value of water and treatment.

By Craig Mandli

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### Asking the Right Question

By refusing to be satisfied with established practices, the plant team in Vermont's capital has slashed energy use and helped the city toward its net zero goal.

By Doug Day

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Experience shows that thorough investigation of pumping issues leads to long-lasting and cost-effective solutions.

By Ben Lawrence

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A new venture looks to accelerate co-digestion of food waste as a way to divert organic material from landfills and increase renewable power generation.

By Ted J. Rulseh

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Robotic-style underwater vehicle enables the easy inspection of water tanks.

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An equipment rental company finds a creative solution for bypassing wastewater during repair of a deteriorated pipe at a treatment plant.

By Scottie Dayton

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A wetland shaped like an endangered small mammal provides effluent polishing and wildlife habitat in Petaluma, California.

By Jeff Smith

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IVL Flow Control solutions aim to help water utilities build autonomous distribution systems that ensure reliable supply and limit losses to leakage.

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Product Spotlight – Wastewater: Ultra-low phosphorus filter from Aqua-Aerobics

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By Ed Wodalski

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coming next month: June 2016

**FOCUS: ACE16 Show/**

**Odor Control and Disinfection**

- » Let's Be Clear: Of taxis, drones and aeration tanks
- » Top Performers:
  - Water Plant: Directors Awards in Salt Lake City, Utah
  - Wastewater Plant: H.L. Mooney Advanced WRF, Prince William County, Virginia
  - Wastewater Operators: Winning the WEF Operations Challenge
  - Wastewater Operator: John Holton, Southwest Licking (Ohio) Community Water and Sewer District
- » How We Do It: Advanced grit removal in Grand Island, Nebraska
- » Sustainable Operations: Award-winning CHP in Miami-Dade County, Florida
- » In My Words: Supporting water audit accuracy in California
- » Tech Talk: Understanding activated carbon
- » PlantScapes: Sports field conceals wastewater facilities in Alexandria, Virginia
- » Technology Deep Dive: Inline pumping for lift stations

A large, detailed image of a Flygt 4320 submersible mixer is positioned on the right side of the advertisement. The mixer has three large, curved, yellow propeller blades. The central motor and drive mechanism are grey and metallic, mounted on a sturdy metal frame. The background is a solid blue color.

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let's be clear

## Are You Connected?

ALLIANCES WITH GROUPS WORKING FOR WATER QUALITY AND ENVIRONMENTAL PROTECTION CAN HELP CLEAN-WATER AGENCIES WIN FRIENDS AND FURTHER THEIR AGENDAS

By Ted J. Rulseh, Editor

**A**s a lake property owner, I'm a member of local, county-wide and statewide lake protection organizations. Lately it has struck me that in working with these groups and attending their meetings, I've yet to encounter a clean-water operator.



I know that many utilities and individual operators do advocate in various ways for water-quality and environmental initiatives. One good example is the Franklin (New Hampshire) Wastewater Treatment Facility. Ken Noyes, chief operator (profiled in this issue of TPO), and members of his team support water-quality monitoring efforts on the Merrimack River, taking and analyzing water samples and placing rock baskets for macroinvertebrate studies.

In editing this magazine I have met other operators who volunteer for everything from watershed protection groups to fishery improvement projects to community pharmaceutical and hazardous waste collection programs. But why does such activity strike me as more the exception than the rule?

### WHY THIS MATTERS

My perception could be off base — I am not involved in daily life at clean-water plants and don't see everything operators do. But to the extent this perception is accurate, what's to be done to bring about change?

I feel confident in saying the general public harbors deep misconceptions about treatment plants. At the most basic level, many people think of them as sources of pollution, rather than preventers of it. It's also safe to say that those who see treatment plants for what they really are still (as a rule) grossly underestimate their importance.

Getting straight to the heart of the matter, treatment plants and collections systems need large investments in expansion, maintenance and modernization. And the willingness of people to support those investments (through higher user fees) is directly proportional to how important they think the facilities are.

### CHANGING PERCEPTIONS

The best way to change public perceptions of treatment plants is to connect them directly and visibly to environ-

mental quality improvement. And here, operators' ties to environmental organizations can have great value.

I'll admit, some environmental groups can be polarizing. Some can be radical. Maybe you don't want to connect with those that fit such a description — large segments of the public may not even be on their side.

But what about groups doing specific work for the benefit of the local environment? Who are they? What are their aims? Can your agency or facility support their missions? Naturally, there are only so many people on your team and only so many hours in a day. But what if you were to take a methodical approach to forging connections with the appropriate groups?

The groups worth supporting aren't limited to those working directly to protect your receiving water, or water resources generally. All that matters is that they connect somehow with quality of environment and quality of life outdoors.

### TAKING INVENTORY

The groups worth supporting aren't limited to those working directly to protect your receiving water, or water resources generally. All that matters is that they connect somehow with quality of environment and quality of life outdoors.

So, consider starting with an inventory. Watch your local newspaper and community bulletin boards. See what groups are out there. Watershed organizations for sure. Lake associations. Groups that promote youth hunting or fishing. Friends groups supporting state, county or city parks. Local land trusts. Bird-watching groups. Cast a wide net. Make a list of all the groups that conceivably would merit your involvement.

Then, get your team together and choose the groups where your support would seem the most mutually beneficial. Select a realistic number of groups — it doesn't pay to spread yourself too thin. Ask for a volunteer to serve as a liaison to each group. Then contact each group and offer to be of service; pay the membership fee if there is one.

### THE PAYOFF

There's no telling where the involvement with each group might lead. It could evolve into service on the board of directors. Or to a high-profile role in a highly visible community project. To names and pictures in the paper and online. To video on TV news. And more.

The benefit is clear: people in your community making solid connections between your team members, your facility and good things for the waters and the environment.

Has this approach worked for your facility? You are welcome to share stories of how you benefit from community involvement on the environmental front. Send me a note at [editor@tpomag.com](mailto:editor@tpomag.com). I promise to respond, and we'll share compelling stories in a future issue. **tpo**

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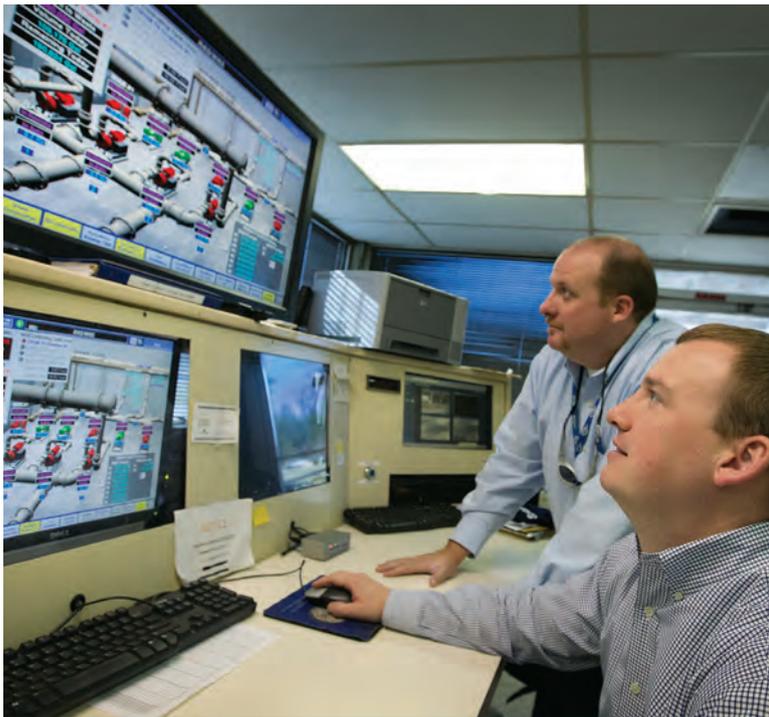
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## NO FEAR!

### Conquering Your SCADA Trust Issues

SCADA is great in many ways. However, technology does require a certain set of checks and balances. In this online exclusive, operator and plant supervisor Jeff Kalmes explains how he conquered his SCADA trust issues by developing a system that incorporates plant rounds with digital information.

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## OVERHEARD ONLINE

"To be clear, most water professionals are perplexed — even stunned — at what transpired in Flint. They take seriously their obligations to protect the families in their communities."

*Together, We Can Get the Lead Out*  
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## WATER WINNER

### Where Taste is King

Tasty water is serious business. In this feature, you'll learn more about the Berkeley Springs International Water Tasting event, which brings water producers from around the world together for some friendly competition.

Also, find out about the competition's newest category: purified water.

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## FLOOD RECOVERY

### Dealing With the Damage

Two St. Louis plants took a beating during a 500-year flood event in December 2015. In this online exclusive, you'll learn about the recovery process and see what plant staff learned from the record rains that caused more than \$25 million in damages to the wastewater treatment plants.

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# MULTITASKER

DUSTAN RUSSUM BUILT AN AWARD-WINNING CAREER AS 'ONE-PERSON DPW,'  
MANAGING WATER AND MULTIPLE PUBLIC WORKS JOBS IN TINY FREDERICA, DELAWARE

STORY: **Jack Powell** | PHOTOGRAPHY: **Mike Baker**

WHAT DO YOU DO WHEN YOU NEED YOUR TOWN'S WATER WELL up and running? How do you get an old municipal building floor torn up? Who can spell the mayor when he wants to take a break? In Frederica, Delaware, it's a no-brainer: Ask Dustan Russum.

Nominally, Russum serves as public works water operator for this town of 812 near the Murderkill River in eastern Delaware. In reality, he's much more. Since he joined the Frederica Water Department in 2014, Russum has brought creative, money-saving ideas, strong technical skills and a "gimme-what-you-got" commitment to the position.

## SALUTED FOR SKILLS

Russum, a native of nearby Harrington, a city of 3,700 that hosts the Delaware State Fair, has accomplished a great deal in a relatively short time. His accomplishments include helping Frederica earn a Best-Tasting Water Award from the Delaware Rural Water Association (DRWA) and being named that association's 2014 Water Professional of the Year.

Russum was honored for bringing the water system into EPA compliance, installing the town's fluoride system and for fixing a well that has substantially improved fire protection and water service for the east side of the community. Moreover,

he saved Frederica millions of dollars by using old parts and borrowing others to repair water equipment, and by applying his more than 14 years of water experience to rebuild chemical (chlorine) pumps rather than buy new ones.

"I was surprised and happy when I won," says Russum. "2014 was a good year for me. I had been here only a few months and we won the best-tasting water competition. Then a short time later I got the Water Professional of the Year award. There were eight or nine operators nominated, so I was very pleased to be recognized."



Dustan Russum, water operator with the Frederica (Delaware) Public Works Department.

## LOVING THE WORK

Russum's interest in providing safe, clean drinking water began soon after he graduated in 1998 from Lake Forest High School in Felton, Delaware. In 2000, he joined the City of Milford Sanitation and Street Department. A short while later he learned that the Town of Milton was hiring for a water department position as an equipment operator. After he got the job, the town sent him to an 18-week water operator course at Delaware Technical Community College to get his Grade 1 water operator certification.

He stayed in Milford for about five years before moving to Milton, about 38 miles south of Dover, the state capital. He spent eight years in Milton, becoming water supervisor in 2005 and director of Public Works in 2010. Living 10 minutes away, he knew Frederica well. In fact, he did a water meter upgrade for the town in 2013, got to know the water operator, and even volunteered to help out if he got sick. That operator started his own business and left, creating an opening that Russum filled in March 2014.

"I really love this job," says Russum. "Frederica is a great place to work. Everybody here is family-oriented, so if I have a family problem, they tell me to take care of that first. The people here always stand behind you, and they want you to succeed."

## PUMP REDUNDANCY

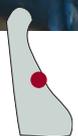
Succeed is what Russum has done almost from the day he started. Early on, he discovered a 550 gpm well house that had been sitting idle for nearly 10 years and asked, "Why don't we use it?" Fiscally cautious town officials wanted to know what it would cost to get it back online. Russum responded by researching the issue, fixing parts and updating controls. Result: For less



“Water is definitely a good career with a lot of opportunities. ... Every day is an adventure. There’s always something new going on. No two days are alike. What works today might not work tomorrow, so you always have to find a solution.”

**DUSTAN RUSSUM**

Among his achievements, Russum has saved his community millions by using old parts and borrowing others to repair water equipment.



**Dustan Russum, Frederica (Delaware)  
Public Works Department**

POSITION: **Water operator**

EXPERIENCE: | **16 years**

DUTIES: | **Oversee two well houses in the town water system; perform tasks as needed**

EDUCATION: | **Lake Forest High School, Felton, Delaware; water operator course at Delaware Technical Community College**

CERTIFICATION: | **Grade 1 water operator**

GOALS: | **Stay on and continue delivering excellent service**

GPS COORDINATES: | **Latitude: 39°00'30.90"N; longitude: 75°27'53.35"W**



Dustan Russum helped Frederica avoid a major expenditure by finding a fix for a water tower that had been slated for replacement.



Russum plugs into a newly installed changeover station. In high wind and subfreezing weather, he was preparing for a major snowstorm, which hit 36 hours later.

than \$10,000, he got the abandoned well house up and running and supporting the town's 750 gpm well.

Today, Russum operates the two wells that average 70,000 gpd between them and service 380 to 400 homes, drawing water from the Frederica Aquifer and treating it with fluoride and chlorine. The pumps are electronically linked. One well comes on, and the next time water is needed, the other well kicks in. If there is a serious drop in water pressure and one well can't keep levels up, the second one takes up the slack.

## FIXING A PHANTOM LEAK

Dustan Russum proved his value almost from the day he started in Frederica, Delaware. Case in point: a supposed leak in the town's 100,000-gallon water tank that he pursued with a vengeance.

When Russum came aboard, town officials told him there was a hole in the water tank and it couldn't be filled to capacity. Chick Glenden, the mayor, believed there was a leak because water had been seen pouring out the tank. At one point, the town considered installing a new bladder at great cost. Coincidentally, the town council was exploring a project with another engineer (who has since left) to build a 300,000-gallon water tower for \$1.8 million.

"One day I was working with Dustan in the well house and he said, 'Pete, our existing water tower isn't that bad,'" recalls council member Pete Rager. "This engineer wanted to put in a big water tower that would do us for the rest of our days, and Dustan said, 'I don't think this one needs to come down yet. Let's ask some questions.'"

That's just what Russum did, talking with experts and researching the issue online to find out if there was a leak and what could be causing it. He called in a contractor who did an inspection and confirmed that there was no leak. It turned out that the tower had a bad vent, which Russum ordered replaced.

"I was able to get the town more storage and more psi in the system due to my tweaking of the tank," says Russum. "We didn't need to tear the water tank down, so we ended up saving money."

That's somewhat of an understatement, according to Rager, who estimates that the town saved about \$1 million by not having to replace or extensively repair the tower. That tower will complement a new one being built at the other end of town, supporting Frederica's annexation of an 8-acre piece of property that includes a service station, convenience store and pharmacy.

Town officials appreciate Russum's contributions and ability to get the job done on a \$100,000 annual budget. Mayor Chick Glanden, for one, considers Russum a real asset, citing his creativity, commitment to saving money and willingness to pitch in.

"Dustan goes above and beyond the call; he does a little bit of everything for us and has saved us a ton," says Glanden. "He went over to an old building here and busted up the floor so we could pour a new one. Any leaks that come up in town, he'll fix himself, and if he can't he'll get a contractor. He's a one-person Public Works Department who does it all — from changing lightbulbs in Town Hall to sitting at the desk if I want to take a quick break."

Another booster is Pete Rager, a town council member who is getting involved in repairing equipment, doing water cutoffs (for non-payment of bills) and handling other projects. "Dustan is a hard worker who treats the town's money like it's his own," says Rager.

"Instead of going to a catalogue and buying the newest and greatest equipment, he'll say, 'Maybe we can make this work.' Everyone on the council agrees that Dustan is working out well for us. He's been in the water business so long

“Dustan goes above and beyond the call; he does a little bit of everything for us and has saved us a ton. ... He's a one-person Public Works Department who does it all — from changing lightbulbs in Town Hall to sitting at the desk if I want to take a quick break.”

**CHICK GLANDEN**

that he has a lot of resources we can use. Not only can he do it all, but he's also been good at teaching me how things work, so I can step in and help when the need arises.”

### INNOVATION AND SAVINGS

Other examples of Russum's ingenuity include:

- Rebuilding water treatment chemical pumps.
- Using all his resourcefulness to learn about and replace a 20-year-old rusted-out well pump that failed. This required much online research and numerous phone calls to pump suppliers and finally to a well driller, who pulled the pump so Russum could put in a new one.
- Installing an automatic flushing station (Kupferle) designed to improve and maintain chlorine residuals and flush disinfectant byproducts (DBPs). The unit runs water every morning for about two hours so the lines stay clear.

For Russum, it's all part of the job. He typically works 8 a.m. to 3 p.m., starting by inspecting the wells and checking the readings to make sure the water meets regulatory requirements. He's on call 24/7 every day. If that isn't enough, in his free time he works with his wife, Shelly, and other family members on his family's 50-acre farm, growing hay and vegetables sold at co-ops and farmers markets.

"Water is definitely a good career with a lot of opportunities," Russum says. "When I go to classes and seminars and I look around the room, many of the operators in this area are in the 55- to 60-year-old range. They'll be retiring pretty soon, and someone has to fill their shoes. Also, every day is an adventure. There's always something new going on. No two days are alike. What works today might not work tomorrow, so you always have to find a solution." **tpo**

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The Water Walk is a family event and a big part of the district's Water Week festivities.

# In the Shoes of Those in Need

A WATER WALK SPONSORED BY A SOUTHWEST UTAH WATER CONSERVANCY DISTRICT HIGHLIGHTS WEEK OF FUN AND EDUCATION AROUND THE VALUE OF WATER AND TREATMENT

By Craig Mandli

For the fifth straight year, a warm, dry winter stressed southwest Utah's water reserves. But it could be worse: While longtime locals call it the worst drought in memory, freshwater still runs from their taps.

That's why every May, the Washington County Water Conservancy District sponsors an event that highlights the efficiency of its potable water delivery system, but also encourages residents to conserve.

The annual Water Walk caps a week of outreach in St. George, Utah. At The Garden in Tonaquint Park, Mayor Jon Pike leads hundreds of residents on a 2-mile walk — the distance those in the world's water-stressed communities walk daily for clean water.

"People take clean, drinkable water for granted in this country," says Ron Thompson, general manager. "The Water Walk lets them walk 2 miles in the shoes of those who struggle every day to provide clean water to their families. The goal is to help put things in perspective."

## COMMUNITY GROWTH

That perspective is needed because Washington County's population has grown by more than 800 percent in the last 30 years, to more than 160,000, accelerating demand for water in the desert environment. More than 60 percent of the county's water is currently used for irrigation; much

“We feel it's important that our residents know there will eventually be a breaking point if we don't cut back and get usage under control. Water is the fundamental ingredient that protects quality of life.”

**RON THOMPSON**

of this irrigation water is too brackish for other uses, even landscape watering, without costly desalination. In 2010, the county used 320 gallons per person per day (including secondary water), versus a statewide average of 240 gallons, according to a 2015 Utah Division of Water Resources report.

"We obviously have a fairly robust water system, but we're also in the fifth year of a drought that hasn't broken yet," says Thompson. "We feel it's



PHOTOS COURTESY OF THE WASHINGTON COUNTY WATER CONSERVANCY DISTRICT

The district's Garden Fair includes interactive displays, children's games, educational booths, prizes, music, refreshments and other activities.

important that our residents know there will eventually be a breaking point if we don't cut back and get usage under control. Water is the fundamental ingredient that protects quality of life.”

## WEEK OF WATER

That quality of life is the basis of the district's Water Week activities. Besides the Water Walk, activities include a Garden Fair with interactive displays,



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kids' games, educational booths, prizes, music and refreshments. It's a family event that presents a panorama of the water industry and proper water practices.

"The fair is a community festival with an educational undertone," says Thompson. "We've done it for seven years, and it's gotten bigger every year. We get a lot of volunteers and community support."

Also part of the week are tours of the Quail Creek Water Treatment Plant and the St. George Wastewater Treatment Plant. The tours help visitors understand the water cycle. "The tours have grown in popularity every year," Thompson says.

"We want people to know there are no secrets when it comes to treating their water. It's well worth the effort just to hear the feedback when you let people see what's going on." Visitors learn about every step in the process, from collecting raw water at the Quail Creek Dam to discharge of effluent at the wastewater plant.

"People see the effluent we start with at the wastewater plant, and they think that's what is released to the environment," says Thompson. "We bring them into the lab to demonstrate the extensive testing we do on potable water and treated wastewater. I think they go away appreciating just how many steps we need to take to provide high-quality drinking water and protect the environment."

### CONSTANT OUTREACH

The district's outreach programs don't end with Water Week. Plant tours are available to school and community groups year-round, and employees regularly give school presentations on water conservation. "The tours are extremely popular with home school groups, Boy Scout troops and other youth groups," says Thompson. "The more informed the public is, the better decisions are ultimately made."

Thompson says it's important that the district keep the area's decision-makers in the loop as well. The area's ongoing drought conditions mean that long-term planning is paramount. "Our leadership is very engaged in



Plant tours teach participants about every step in the treatment process. Hank Childers, the wastewater plant operations manager, lead this tour.

what we do here," he says. "They realize that water sustains the economy."

While Water Week goes back seven years, community outreach goes back more than 30. Thompson says maintaining transparency, celebrating clean water, and highlighting the steps to produce and protect it should be building blocks for every municipal treatment plant's business model.

"We realize it's the taxpayers that own these plants," he says. "All you have to do is look at what's happening in Flint, Michigan, to realize how outreach is more important today than ever. It's our duty to make sure the people understand how our plants work." tpo

# A Productive *Journey*



AN ALABAMA UTILITY RESOLVES LINGERING BIOSOLIDS  
MANAGEMENT ISSUES WITH A THERMAL DRYER  
THAT YIELDS HIGH-VALUE CLASS A MATERIAL

STORY: **Ted J. Rulseh**

PHOTOGRAPHY: **Meg McKinney**

**THE MUNICIPAL UTILITIES BOARD OF THE CITY** of Albertville evaluated numerous options before settling on a long-term biosolids technology.

Between landfilling 30 years ago and indirect closed-loop thermal drying today, the utility tried land application of Class B biosolids and explored thermophilic digestion, lime stabilization and various direct drying technologies.

Elden Chumley, general manager and CEO, calls the Alabama utility's BIO-SCRU drying system (Therma-Flite) a clean and economical process that yields Class A biosolids with a variety of potential applications.

"Nearby landfills were no longer in operation and land application sites were limited," says Chumley. "We had to start looking for the next phase. We asked, 'As the city grows, what is going to be our option?' We looked at drying technologies for reductions in volume, handling costs and regulatory restrictions. Today, our end product is 90 percent dry and meets the Exceptional Quality requirements. It has done very well in the marketplace. Further treatment of the material makes it easier to find end uses for it."

The process yields about 104 dry tons per month. Most of the material is applied to hay fields; some is used for landscape fertilization.

### QUALITY EFFLUENT

Albertville, in northeast Alabama, has a diverse industrial base that includes poultry processing, automotive and paper manufacturing, plastics extrusion and wood products. It is also, in Chumley's words, "the fire hydrant capital of the world" — Mueller Systems operates a large plant there.

Albertville's 11.5 mgd (design) wastewater treatment plant uses a conventional activated sludge process to treat an average 7 mgd flow that is about half industrial. Effluent discharges to Turkey Creek, which ultimately flows into Short Creek (a Tennessee River tributary) upstream of Albertville's drinking water intake.

For that reason, and because Turkey Creek is classified as a fish and wild-life stream, effluent quality is paramount. The plant consistently meets permit limits of 5 mg/L BOD, 30 mg/L TSS and 1.2 mg/L ammonia. Final effluent is disinfected with chlorine and dechlorinated with sulfur dioxide.



Newer structures along the treatment plant's front drive include active treatment tanks with geodesic dome covers (Temcor).



## Municipal Utilities Board of the City of Albertville (Alabama)

FOUNDED: | 1943

POPULATION SERVED: | 20,000

PLANT FLOWS: | 11.5 mgd design, 7 mgd average

BIOSOLIDS PROCESS: | Thermal drying (Class A product)

BIOSOLIDS VOLUME: | 104 dry tons per month

BIOSOLIDS USE: | Mainly agricultural fertilizer (hay)

CITY WEBSITE: | [www.mub-albertville.com](http://www.mub-albertville.com)

GPS COORDINATES: | Latitude: 34°16'5.35"N; longitude 86°12'39.70"W



Primary and waste activated sludges are anaerobically digested and dewatered to 16 to 17 percent solids on a belt press (Alfa Laval Ashbrook Simon-Hartley) before thermal drying.

### PROCESS OF ELIMINATION

Albertville's biosolids journey goes back to the mid-1980s, when sludges were dewatered on drying beds, manually removed and hauled to a city-owned landfill. In the early 1990s, that landfill was converted to construction and demolition waste only. The utility had to seek alternatives because private landfills charged tipping fees and were farther away, increasing hauling costs.

"We decided in 1994 to land-apply Class B biosolids," says Chumley. "We met all the Class B qualifications because of the heating process in the digest-

The team at the Albertville wastewater treatment plant includes, from left, front row: Austin Harvey, Bryan Miller, Lance Davis, Casey Cook and Elden Chumley. Stairs, front row: Mike Smith, Dale Williams, Michael Childers, Lucas Moore, Tyler Harden, Erik Springfield and David Gilbert. Stairs, back row: Lance Mullinax, Jake Eason, Keith Galloway, Kadin Dick and Billy Woodham.

ers. We began applying biosolids to hay sites for cattle operations." A third party hauled and applied the dewatered cake.

Land application worked reasonably well, but wasn't ideal. Sites had to be permitted. Farmers had to keep livestock off treated ground for specified periods. Because the closest suitable farms were 13 to 20 miles from the treatment plant, trucking costs were significant. "When fuel costs got up to \$4 a gallon at various times, we were spending \$160,000 to \$200,000 a year in handling costs," Chumley says.

There were also seasonal issues. In wet conditions, when application sites were not available, material had to be landfilled and tipping fees paid. "Eventually we built a covered storage area so we could hold product until farmland was available," says Chumley.

### STEPPING UP IN CLASS

In the mid to late 1990s, Albertville began to investigate producing Exceptional Quality material. Thermophilic digestion turned out not to be feasible because the existing digesters were not designed for sustained higher temperatures — new digesters would need to be built.

"We studied dryers and actually took bids on one," Chumley says. "The capital costs at that time were prohibitive. Between that and the price of nat-

“Once our staff received training from the dryer technical team, they rose to the occasion.

The production of Class A biosolids adds some extra work to our process. The team really stepped up to the plate because it was the best thing for the future of our community.”

**ELDEN CHUMLEY**

ural gas to run the dryer, it didn't make sense versus what we had been doing. Instead of \$200,000 a year in handling costs we were facing up to half a million dollars for operations, plus the capital cost. Therefore, we had to shelve that project.”

A study of lime stabilization in the early 2000s found that the treatment plant lacked adequate space, and the issues of limited farmland and high hauling cost remained. The search ultimately led to the drying technology in place today. “We kept looking for a dryer we could run economically, and we found it in the Therma-Flite dryer,” says Chumley. Krebs Engineering of Birmingham was the consultant on the project; the dryer went online in 2014.

### AUTOMATED PROCESS

The BIO-SCRU dryer system is fully automated; all operating parameters are regulated by a programmable logic control (PLC) system. The technology is designed to dry digested as well as undigested primary and waste activated sludges, as well as mixtures of those types.

The heat for drying comes from thermal fluid circulated through twin screw rotors, flighting and the outer jacket of the drying chamber in a closed-loop path. Drying proceeds under slight negative pressure in a sealed chamber. A lock box and cooling screw maintain the seal at the discharge. An integrated scrubber/condenser removes vaporized water and captures particulate. The system's self-clearing design continuously removes buildup from the heat-transfer surfaces. A series of cutters keep large clumps from building up and passing through the system.

“We liked the thermal fluid concept,” says Dale Williams, wastewater plant manager.

“Once we heat the fluid, it recirculates, and we just use energy to maintain the temperature. That makes the dryer more efficient. It also has a smaller footprint so that we could put it in an existing space.”

SEPEX pumps deliver 17 percent solids cake into hoppers from which the drying unit is fed. The thermal fluid circulates at about 540 degrees F; the product itself is heated to about 220 degrees F for a detention time of three to four hours, depending on how much feedstock material is being processed. At discharge, the material passes into a water-jacketed cooling screw that lowers the temperature to about 100 degrees F, and then is air-cooled in two screw conveyors (SPIRAC).

### TARGETING EFFICIENCY

The dryer can operate in a batch mode, but the Albertville team prefers to run it continuously for two to three days at a time to avoid the inefficiency that goes with repeatedly starting up and cooling down. Operator interaction is limited. “The biggest thing is to maintain a constant feed rate and constant temperatures to ensure a 90 percent solids product,” says Williams.

The boiler (The Fulton Cos.) inside the dryer system can burn both pipeline natural gas and digester

biogas; the Albertville team uses both and is looking to expand the biogas share. “We don't have enough biogas to fully run the dryer,” says John Wright, wastewater superintendent.

“At present, we use about 70 percent natural gas and 30 percent biogas.”

They are exploring ways to feed the boiler a blend of natural gas and biogas. That would eliminate the short production delays that go with switching from one fuel to the other. Meanwhile, they have added two methane storage tanks and now have three. “When we had only one tank, we would build

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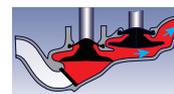


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ABOVE: Bryan Miller, left, and Michael Childers, maintenance technicians, check the gauge on a progressive cavity pump (SEEPEX). LEFT: Elden Chumley, general manager and CEO, feels his team stepped up to the plate during the transition to the production of Class A biosolids.

up a fuel supply and use it, and then we had to wait to rebuild the supply from the digesters before we fed biogas again,” Wright says. “The additional storage tanks will give us longer runtimes on biogas. Now we can fill one tank while we’re pulling out of another.”

### APPEALING PRODUCT

The dryer’s end product has the consistency of coarse sand and is dark gray. Demand has been immediate and strong. It’s sold in large bags that hold nearly a ton of material; the price is \$15 per bag. The primary customer is a farmer who picks up the product at the treatment plant and applies it to hay land. This has eliminated the treatment plant’s hauling costs.

“We have a verbal commitment with him for a year,” Chumley says. “This is our first year of full dryer operation, and we’re in a trial and error mode with marketing. The product has a high nitrogen content. The farmers in our area understand its value. We’re not having any difficulty selling it. We’ve talked to other farmers who want to apply it straight to farmland. We’ve talked to potential customers who want to blend it with other fertilizers. We’re not sure what direction we’ll go in the long term, but it’s great to have a number of options.

“We’re evaluating the price we sell the product for. I believe the people we’re dealing with now, and others who are interested, would be willing to pay a little more. After we get this first year under our belt, we’ll have more information, and our prices may change.”

*(continued)*

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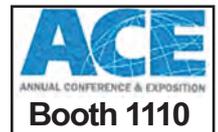
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## IT'S IN THE BAG

There are many ways to load and transport dried biosolids products. The Municipal Utilities Board of the City of Albertville uses bags — great big ones.

“We’re using what we call super sacks,” says John Wright, wastewater superintendent.

“They’re breathable bags often used to haul sand, gravel and other products. Each bag holds about 1,600 to 1,800 pounds of our material.”

The bags, purchased from Joe M. Almand in Atlanta, Georgia, have straps at the four corners that can be used for handling. The treatment plant team engineered a hookup and auger system to fill the bags. “We’re set up with two chutes,” says Wright. “When one bag is full, we can pull a chain lever and switch over to start filling the other bag, while the full bag is removed and replaced with an empty bag for another run. We change bags about every two hours. We use a forklift to load the filled bags onto truck trailers for hauling.”

It’s possible to blow dried biosolids into storage silos or load it directly into trucks. Albertville chose to use the bags largely for dust control: The plant is not equipped to spray the product with oil or water for dust mitigation.

The bags do pose logistical issues for farmers at the land application sites: The bags have to be opened and the product transferred to broadcast spreaders. “In the future, we may come up with a different mechanism where we could load directly into a spreader,” says Wright. “As of now, that’s a capital investment we’re not prepared to make.”

“ We liked the thermal fluid concept. Once we heat the fluid, it recirculates, and we just use energy to maintain the temperature. That makes the dryer more efficient.”

DALE WILLIAMS

## SUBSTANTIAL SAVINGS

The dryer was part of a \$6 million plant upgrade project that also included a PISTA Grit system (Smith & Loveless) at the headworks, an improved digester mixing system, and the two new biogas storage tanks and low-pressure gas delivery system.

Chumley estimates payback on the dryer itself at about seven years, counting elimination of \$200,000 in annual hauling costs and revenue from product sales. The dryer was designed to handle Albertville’s biosolids volume while running at half capacity. That means potential exists to dry material from neighboring communities.

Chumley expressed gratitude to Therma-Flite representatives who helped with installation and startup, and to plant team members. “Therma-Flite had staff members here for the first 45 days,” he says. “Our people were right there beside them and received valuable training.

“Once our staff received training from the dryer technical team, they rose to the occasion. The production of Class A biosolids adds some extra work to our process. The team really stepped up to the plate because it was the best thing for the future of our community.” **tpo**



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# Asking the Right Question

BY REFUSING TO BE SATISFIED WITH ESTABLISHED PRACTICES, THE PLANT TEAM IN VERMONT'S CAPITAL HAS SLASHED ENERGY USE AND HELPED THE CITY TOWARD ITS NET ZERO GOAL

By Doug Day

In his five years at the Montpelier Water Resource Recovery Facility, Chris Cox has learned the value of asking one simple question: “Is this how it has to be?” Since 2010, that question has helped the plant staff cut total energy use almost in half.

That helped the plant win the 2015 Governor’s Award for Environmental Excellence and the 2014 Energy Management Award from Efficiency Vermont, which has helped in the energy reductions over the last six years.

The assistance has included funding for projects and an energy audit in December 2013. “That helped get the ball rolling, and it got all the operators thinking about being more energy conscious,” says Cox. “We took what they had and went running with it.”

Most of the success has come from about 16 small projects over the last three years at the city’s conventional activated sludge plant (3.97 mgd design/1.8 mgd average flow). Cox became chief operator last summer and gives much of the credit for the energy savings to his predecessor, Bob Fischer.

Average daily electrical use has been reduced by 34 percent in six years, from 5,040 kWh in 2008 to 3,350 kWh in 2014. In the last five years, the plant cut its average gasoline use by 50 percent, from 30,000 gallons in 2010 to 15,000 gallons a year today.

“We’re trying to figure out if we can take in other organic waste to increase the methane production to maybe talk about cogeneration. That would be a great help.”

**CHRIS COX**

## QUESTIONING ATTITUDE

Thinking outside the box has helped the plant staff come up with ideas that go against long-standing past practice. For instance, the dissolved oxygen level in the aeration basins had been maintained at 4 mg/L because of problems with filamentous bacteria. Since blowers make up about 38 percent of the plant’s electrical demand, reducing DO to 2 mg/L meant big energy savings and did not affect the treatment process.

For many years, the plant had run two of its three Archimedes screw pumps and their 40 hp motors all the time in winter to keep them from freezing. “Two years ago, we decided to try to run just one,” says Cox. “We bump-start the other two periodically just so they won’t freeze. That works fine, and there haven’t been any issues.”



The primary settling tanks at the Montpelier plant with a movable bridge for primary sludge collection. INSET: The plant won the Governor’s Award for Environmental Excellence in 2015.

Another energy waster was a 5 hp blower that ran about 40 hours a week to ensure that the thickened waste activated sludge would stay in suspension. “In the last month, we haven’t run it once and we’ve been able to pump sludge,” Cox says.

Septage and leachate handling has also been a target. The plant takes in 30,000 gallons of leachate per day from the state’s only active landfill and 30,000 gallons of septage. Keeping it mixed used a lot of energy that turned out to be unnecessary.

“We have two 50,000-gallon tanks, and they each have a 5 hp mixer and a 40 hp blower to keep the solids suspended,” says Cox. “We just stopped mixing and aerating it. We were worried about how often we would have to clean the tank due to plugging, but we found that it’s actually cleaner not mixing or aerating it.”

The plant has even increased the amounts of septage and leachate it accepts, which means keeping a close eye on *E. coli* every week. But the tipping fees provide income that helps fund energy-saving equipment. “Last year we made more than \$800,000,” says Cox. “It gives us the ability to act on energy savings ideas that we have.”

## RECENT PROJECTS

Improvements also extend to the headworks. The addition of influent

screening many years ago made it unnecessary to grind primary sludge before it was pumped to the digesters, but the facility's grinder pump still had to be run because it was inline. In June 2015, the team removed the grinder and replaced it with a 4-foot section of pipe, eliminating another 3.5 hp motor that ran about three hours per day.

In September of that year, the plant began two projects to improve power use and monitoring. The local utility, Green Mountain Power, penalizes industrial users that don't have a 95 percent power factor; the Montpelier plant's rating was 86.3. Independent Capacitor Corporation installed a 600-volt capacitor to achieve the 95 percent power factor for \$5,600. It will save nearly \$4,000 per year on electric bills.

Efficiency Vermont provided \$4,000 toward \$12,000 in power monitoring equipment to measure demand from all main breakers in the facility. The plant's average monthly peak load is 246 kW. Cox expects the monitoring equipment to enable a reduction to 225 kW, for a potential savings of \$3,800 per year.

"I can set a limit of, say, 200 kW, and if power demand exceeds that an alarm will sound," says Cox. "I've set up a protocol of turning off different pieces of equipment that won't affect effluent quality yet will keep us from hitting a certain peak demand."



The Montpelier plant staff includes, from left, Devin Hoagland, lab operator; Matt Lamson, assistant chief operator; Chris Cox, chief operator; and Bob Fischer, former chief operator.

Utility companies have different peak-shaving programs, and Cox advises operators to become familiar with their peak demand charges and how they affect the monthly bill.

### NET ZERO GOAL

In 2014, city leaders launched Net Zero Montpelier, a quest to become the first capital city in the nation to produce or offset all of its electric, thermal and transportation energy needs with renewable sources. "The city's Energy Advisory Committee has some expertise and is helping us to get the digesters to be more efficient," says Cox. "We're trying to maximize the potential for the methane we produce because we take in so much septage and leachate."

Currently, the plant does not produce electricity from its biogas; the fuel is burned in a boiler to heat the three anaerobic digesters and one building. "We're trying to figure out if we can take in other organic waste to increase the methane production to maybe talk about cogeneration. That would be a great help," Cox says.

Also on the horizon is an energy efficient hybrid screw blower. Efficiency Vermont will help fund that once cost estimates and energy savings are estab-

lished. Hybrid blowers are generally about 30 percent more efficient than the existing positive displacement blowers.

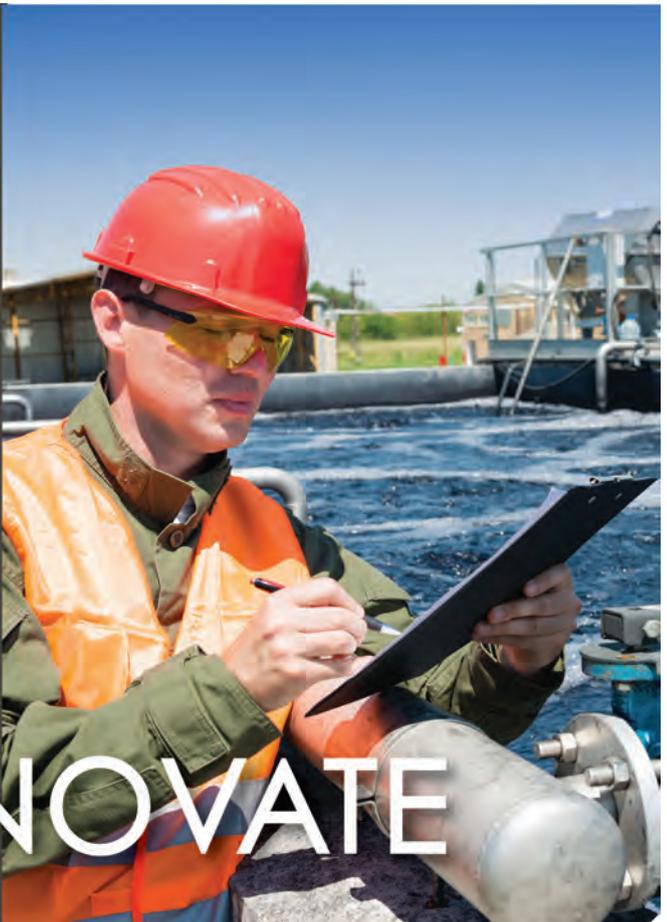
Efficiency Vermont will also fund \$4,500 of the \$15,000 cost of installing variable-frequency drives on the plant's three lift pumps that move sewage from primary to secondary treatment. Each has a 40 hp motor and can pump 4 mgd, much more than the plant's flow. The VFDs are expected to save more than \$5,000 in the first year alone, providing a two-year payback.

Two belt filter presses are also being retired and will be replaced with new automated technology that is more energy efficient, uses less water and produces a higher percent solids material.

Cox is happy with the results but knows the work never ends. "As the state comes out with tighter regulations, we have to use more energy," he says. "Every addition to get higher quality water is going to mean more electricity, so it's a never-ending battle." **tpo**

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# Treat Causes, Not Symptoms

EXPERIENCE SHOWS THAT THOROUGH INVESTIGATION OF PUMPING ISSUES LEADS TO LONG-LASTING AND COST-EFFECTIVE SOLUTIONS

By Ben Lawrence

A woman's foot was killing her. She was an avid runner, but a sharp pain in her arch was keeping her away from the sport she loved.

The first two doctors she visited immediately zeroed in on the point of pain. "Let's give you a cortisone shot," offered Doctor 1. Doctor 2's advice: "Put orthotics in your shoes and your arch won't hurt so much."

Doctor 3 offered a different solution: "Your foot isn't the problem. It's your posture." A week after taking Doctor 3's prescription, her foot pain disappeared.

What does a woman's foot problem have to do with your treatment plant's maintenance problems? In both cases, the focus too often is on the *symptom*, not the *cause*.

The Hydraulic Institute (HI) supports initiatives that can help facility operators get quickly to the root of pump problems and resolve them cost-effectively.



Solids handling pumps found in the pump pit at the University Area Joint Authority.

## WHAT'S THAT NOISE?

A recent event at a wastewater pump station in Pennsylvania illustrates perfectly. The pump system moves wastewater from a storage tank (wet well) to a discharge point at a gravity sewer a long distance from the pump station.

Two pumps are used most of time, pumping through a low-head force main. Three additional pumps are activated during high flows. These pumps discharge into a high-head force main with several high points and low points, traversing 11,000 feet to the gravity sewer.

But the system had a problem: When the high-head pumps kicked on, they occasionally emitted strange noises and vibrations. The maintenance team had some ideas about the cause of the intermittent problem, but their unanswered questions might sound familiar:

- What's wrong with these pumps?
- Under what running conditions are they emitting these unsettling sounds?
- What's causing the problem?
- How can we fix it?

## THOROUGH INVESTIGATION

*ANSI/HI 9.6.5 Rotodynamic Pumps – Guideline for Condition Monitoring* is an industry guideline developed by the Hydraulic Institute that can be used to help prevent critical pump and system failures before they occur.

The guideline specifies means of monitoring power, temperature, corro-

Although the pump station's high-head pumps were emitting all kinds of worrisome signals, the pumps weren't the problem. The real problem was an uphill/downhill, rising/falling pipe system that was siphoning its own flow and causing the pumps to cavitate.

sion, leakage, pressure, vibration, periodic lubricant, shaft position, rate of flow, speed, bearing wear and other parameters. It also provides information on condition monitoring failure modes, indicators, vibration analysis, condition-based maintenance and a preinstallation hydrostatic test.

The guideline educates engineers and maintenance professionals on what type of monitoring and at what interval is appropriate to identify the cause of failure, or to predict failure, thus allowing for scheduled maintenance.

Since the pumps in the example were critical assets for which failures were costly, and because the failures were somewhat random, the guideline recommended that the appropriate monitoring equipment be installed, that data be monitored continuously and that an alarm indication be provided based on set operating parameters. Based on the recommendations of the guideline, the group needed to answer:

- What data is appropriate to gather and with what type of instrumentation?
- How can we monitor these pumps 24/7 and document the problem right when it happens?
- How can we test various solutions without tearing apart the whole system?
- What is the root cause of this problem?

## COST-SAVING APPROACH

Based on the failure modes and indications, the group chose pump vibration and system pressures as conditions to monitor. Believing that identifying and solving the problem would likely cost a mint in engineering, monitoring equipment, installation and consulting and maintenance fees, the organization took a different approach.

They used wireless sensors for easy and flexible installation and lower cost than hardwiring. They also deployed a new pump system software simulation program and engaged groups of engineering students from The Pennsylvania State University (Penn State) looking for real-world experience.

Collaborating with sponsors, Penn State technicians and the University Area Joint Authority, student groups addressed pump system efficiency issues using Internet-based sensor technologies and simulation modeling software.

*(continued)*

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Two student teams sought engineering solutions to one of the biggest challenges in the industrial world: reducing pump inefficiencies that account for up to 20 to 40 percent of wasted electrical energy in industrial and building services. A third team designed and built a pump test loop that was so well done that the sponsoring company intends to continue its use.

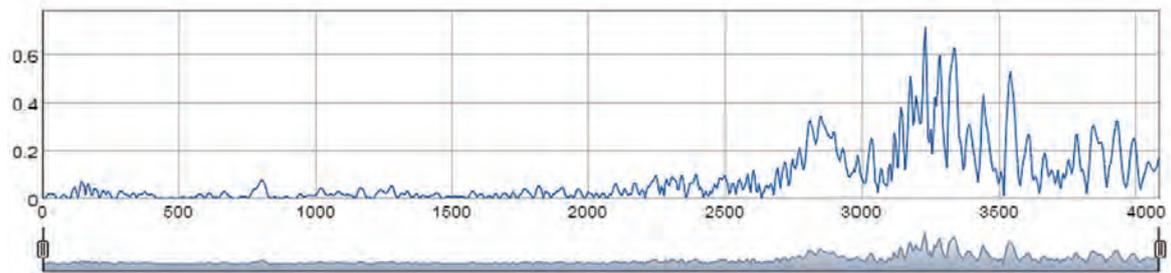
## DRAMATIC RESULTS

The wireless vibration and pressure sensors captured thousands of system-wide data points that would have been impossible for the maintenance staff to capture through traditional methods. The software simulation allowed the team to test hundreds of pump system adjustments without picking up a wrench. The students, by nature comfortable with big data and new technologies, discovered the root cause and developed a fix.

Although the pump station's high-head pumps were emitting all kinds of worrisome signals, the pumps weren't the problem. The real problem was



Graph indicates high and variable overall acceleration, an indication of potential cavitation.



Graph indicates high frequency vibration, an indication of potential cavitation.

an uphill/downhill, rising/falling pipe system that was siphoning its own flow and causing the pumps to cavitate.

Instead of “deadening” the pumps’ cavitation or increasing the suction pressure (two common suggestions), the students designed a simple circulation system at the highest point of elevation in the piping. This circulation system allows the fluid to catch up with itself before careening down the other side of the hill.

The fix cost \$1,000, as opposed to either replacing damaged pumps (\$45,000) or responding to a hazardous overflow situation (\$100,000 or more).

## WISE ADVICE

The next time your pump system shows signs of poor health, look beyond the point where you see or hear a symptom. Ask yourself: What kinds of new wireless technology and software might help identify the cause of this problem? Where can I find a group of eager engineers with the technical savvy to put it all together?

Oh, and next time your foot hurts, check your posture.

## ABOUT THE AUTHOR

*Ben Lawrence (blawrence@kcftech.com) is vice president of KCF Technologies, a technology innovation company based in State College, Pennsylvania, that focuses on putting inventions to work in industrial applications. tpo*

## ABOUT THE HYDRAULIC INSTITUTE

The Hydraulic Institute (HI) is the largest association of pump industry manufacturers in North America. Founded in 1917 and based in Parsippany, New Jersey, it serves member companies and pump users by providing product standards and a forum for the exchange of industry information.

The institute has established itself as the leading voice for the North American pump industry. It offers a wide variety of programs and services tailored to member needs: standards development, networking, access to specific statistical data and economic reports, promotional opportunities, educational materials, breaking industry news, participation in industry initiatives and more.

HI's current programs include a capstone design initiative. An early success of that initiative was a project funded by Flowserve Corporation at Penn State. Working to Flowserve's specifications, students designed and built a pump loop for future training and testing purposes at the company's facility in Bethlehem, Pennsylvania.

A team of capstone design students designed a piping layout, purchased construction materials, assembled the loop and then operated it using a pump and motor supplied by Flowserve. The team created a final report documenting all design decisions, appropriate

drawings, proper instrumentation and assembly instructions.

“As a fellow engineer, I was impressed how quickly these mechanical engineering students learned to design a solid pump test loop with proper instrumentation using HI standards, with excellent results,” says Jessica Phillips, a Flowserve engineering manager.

The Penn State Capstone Projects are the start of an endeavor by HI and its members to work with manufacturers and engineering universities and colleges to implement diverse capstone programs related to pump systems optimization. Besides expanding awareness of pump system efficiency within the pumping industries, the projects will help to recruit mechanical and industrial engineering graduates to those industries.

“The support of industry for capstone design projects at our nation's universities is a win-win proposition,” says Gary Koopmann, emeritus professor at Penn State. “Our young engineers enter the workforce with real-world experience and, in turn, supporting industries are well positioned for early recruiting activities.”

For more about HI, visit [www.pumps.org](http://www.pumps.org).

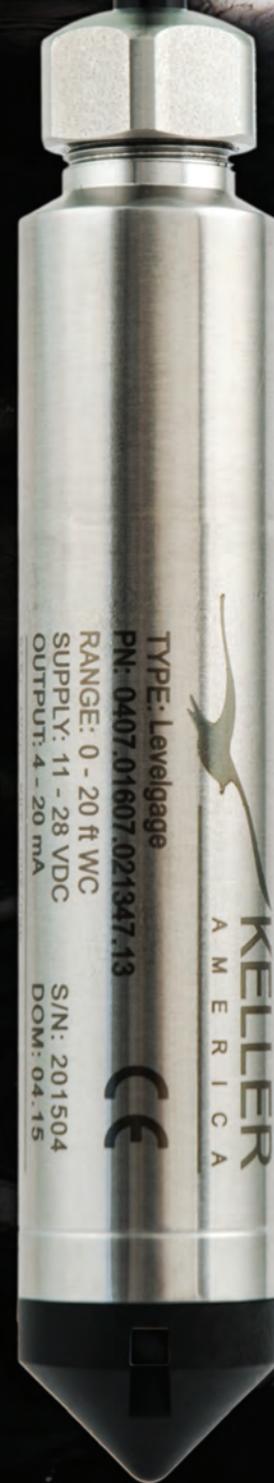
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# EFFICIENCY FIRST

KEN NOYES AND HIS TEAM SET ENERGY EFFICIENCY AS A TOP PRIORITY WHILE MAKING SYSTEMATIC UPGRADES TO THE FRANKLIN WASTEWATER TREATMENT FACILITY

STORY: **Ted J. Rulseh** | PHOTOGRAPHY: **Elizabeth Frantz**

ENERGY EFFICIENCY IS PART OF THE DISCUSSION IN ALMOST EVERY upgrade at the Franklin (New Hampshire) Wastewater Treatment Facility.

It may not be the sole deciding factor, but it has been a key consideration in projects from aeration upgrades to dewatering improvements, pumping retrofits and roof replacements.

“Everybody is energy-conscious now,” says Kenneth Noyes, chief operator at the plant. “In everything we do, we’re trying to reduce energy consumption. I’m sure every treatment plant in the state and every plant in the country tries to do that. It’s an easy way to reduce costs, especially here in New England, where we have some of the highest energy rates around.”

The Franklin plant team has been steadily at work upgrading a facility built in 1979. Now, they’re preparing to deal with an effluent phosphorus limit that could be included in the plant’s next NPDES permit.

## REGIONAL TREATMENT

The Franklin plant (11.5 mgd design flow, 5.5 mgd average) is part of the Winnepesaukee River Basin Program, a state-owned collections and treatment system serving 10 communities in New Hampshire’s Lakes Region with a total resident population of about 62,000 that swells dramatically during summer and winter tourist seasons.

The plant receives wastewater through 50 miles of interceptor sewers, fed by the community collections systems. The network includes 14 pump stations, all controlled by a SCADA system. Influent is largely residential. Noyes and his team, all employees of the state Department of Environmen-



Kenneth Noyes, chief operator, Franklin Wastewater Treatment Facility.

tal Services, run the plant with a \$4.2 million operating budget.

Noyes grew up and graduated from high school in Tilton, the “next town over” from Franklin. He worked for several years with an electronics company in roles that included industrial pretreatment. When that company closed up shop 27 years ago, he landed a second-shift operator position at the Franklin plant.

He took night classes through a community college to gain certification, ultimately earning Grade IV wastewater operator and Grade II collections system licenses. He progressed to Operator II and first-shift operations supervisor before taking his present position 10 years ago.

## CONVENTIONAL PROCESS

Today he oversees a basic activated sludge process. After a flume where influent flow is measured, the wastewater passes through two mechanical bar racks manufactured by E & I Corporation with 1.5-inch bars screens, followed by two aerated grit chambers (Sanitaire – a Xylem brand).

The rest of the process includes two primary clarifiers (750,000 gallons each), four aeration tanks with three bays each and two secondary clarifiers (1 million gallons each). After UV disinfection (Ozonix), effluent is discharged to the Merrimack

River. Effluent averages 12 mg/L CBOD (permit 25 mg/L monthly average) and 11 mg/L TSS (permit 30 mg/L). At present, the plant is required only to report ammonia and phosphorus levels.

Primary and waste activated sludges, blended with septage (4.5 million gallons per year), are thickened and sent to two inground primary anaerobic



“ In everything we do, we’re trying to reduce energy consumption. ... It’s an easy way to reduce costs, especially here in New England, where we have some of the highest energy rates around.”

KEN NOYES

ABOVE: Noyes checks on a GEA Westfalia separator in the centrifuge room. LEFT: The 11.5 mgd (design) Franklin plant is part of a state-owned collections and treatment system serving 10 communities.



## Kenneth Noyes, Franklin (New Hampshire) Wastewater Treatment Facility



POSITION: | **Chief operator**

EXPERIENCE: | **27 years with Franklin facility**

CERTIFICATIONS: | **Grade IV wastewater operator,  
Grade II collections system**

MEMBERSHIPS: | **New England Water Environment  
Association, New Hampshire Water  
Pollution Control Association**

GOALS: | **Train a successor; maintain a compliant,  
efficient operation**

GPS COORDINATES: | **Latitude: 43°25'58.59"N;  
Longitude: 71°38'56.56"W**



## IT TAKES A TEAM

Ken Noyes received the 2014 New England Water Environment Association (NEWEA) Operator of the Year award for New Hampshire. If he had his way, he would slice it up into 18 pieces for his colleagues at the Franklin Wastewater Treatment Facility.

"I have a hard time with individual awards," he says. "It takes everybody to run a treatment plant. I can't do it on my own. My team members are all good people. They all should get awards. That's the way I feel."

Indeed, the entire team has won recognition by way of other awards citing the whole plant's accomplishments. They include:

- 2014 NEWEA George W. Burke, Jr. Safety Award
- 2012 Governor's Excellence in Energy Efficiency Award
- 2006 U.S. EPA First Place Award in Plant Operations and Maintenance (large secondary plant category)
- 1995 U.S. EPA Second Place Award in Outstanding Pretreatment Program

Noyes' operations team includes Arthur O'Connell, operations supervisor; Mark Corliss, plant operator II; and operators Alan Kjellander, Kevin Whelan, Jason Young and Richard Brock.

The plant team also includes Kelly Potter, lab scientist; Don Watson, engineering technician; Craig Shippee, Stephen Sawicki, Tim Pelletier and Gary Grant, plant maintenance engineers; Stan Mitchell, John Spadafore, Jeff Winchell and Tony Brown, electrical/electronics team members; and Barbara Aube and Sharon McMillin, administration.

Kenneth Noyes, left, and electrician Tony Brown check on a power supply unit on the plant's UV disinfection system (Ozonix).

digesters, followed by two secondary digesters with floating covers. Solids reduction averages 50 to 55 percent. Biogas from the digesters is burned to heat the main plant buildings and to supply process heat to the digesters.

"All last winter, we only used 270 gallons of No. 2 fuel oil for heating everything here," says Noyes. "We would need 15,000 to 30,000 gallons if not for the digester methane." The team has looked into adding generator sets for combined heat and power; so far that has not proven economically feasible.

Two centrifuges (GEA Westfalia) dewater the biosolids to about 25 percent solids. All of the Class B cake (597 dry tons last year) is applied to hay and cornfields by private contractor Resource Management, which handles all site selection and permitting.

## STEADY PROGRESS

Starting long before Noyes became chief operator, the Franklin plant has seen multiple improvements. "Around 1990, we changed from coarse-bubble to fine-bubble diffusers [Sanitaire]," says Noyes. "We paid for that upgrade in one year in reduced energy costs."

Another project replaced nine centrifugal pumps used for moving sludges around the facility with positive displacement pumps (Moyno). Along with that project came a complete upgrade of the plant heating, ventilation and air conditioning (HVAC) system by McQuay.

"In 2008, we replaced our plate-and-frame filter presses with the Westfalia centrifuges," says Noyes. "The centrifuges consume more electricity, but they produce a drier cake and enable us to speed up production. We used to have a split shift working the presses until 9 p.m. from July to December,

and we also had to work some Saturdays to keep up. With the centrifuges, we're only running one shift and not putting in overtime. So it's a net positive."

The plant's biggest energy project to date included the 2008 replacement of four aging positive displacement blowers with two 100 hp and two 150 hp high-speed turbo blowers. "We reduced our aeration energy consumption by about 50 percent and total facility energy consumption by 20 percent, while providing better system control," Noyes says. "We reduced our annual

“We shift people around so they're not on the same job all the time. I don't have to tell them what to do. They know their responsibilities. If something goes wrong, we all jump in. We all get our feet wet.”

#### KEN NOYES

power costs by \$63,000 and cut annual greenhouse gas emissions by about 300 tons.”

The project cost \$2 million, but half was covered by a grant under the American Reinvestment and Recovery Act (federal stimulus) and another \$100,000 by an energy efficiency rebate from Public Service of New Hampshire (now Eversource Energy). "So the entire project cost us \$900,000, and the payback on our blower investment was about four years," says Noyes.

#### CAREER SATISFACTION

Saving energy is just one of the rewards Noyes finds in his profession. Another is leading an experienced and dedicated team. Arthur O'Connell, operations supervisor, has a Grade 3 wastewater license and functions as operator in charge when Noyes is away. Mark Corliss, an Operator II, also serves in a supervisory role.

"Most of our people have been here more than 10 years," Noyes says. "They're all good people. They like their work. We shift people around so they're not on the same job all the time. I don't have to tell them what to do. They know their responsibilities. If something goes wrong, we all jump in. We all get our feet wet."

Like many operators, Noyes came to the profession by happenstance but quickly fell in love with it: "I've never heard anyone say, 'When I grow up, I want to be a treatment plant operator.' I didn't either. It's something we fall into. I came to this plant and saw the tunnels with all the piping and electrical systems, and all the equipment. I learned that other than chlorine, no chemicals were used to treat the wastewater — it was all done with microorganisms. It was just fascinating.

"I also liked the idea of helping the environment. At the time I grew up, you didn't swim in the rivers up here. The cities and towns and paper mills pretty much just dumped sewage into the water. If you looked in the river you'd see toilet paper going by. If the woolen mill was using orange dye one day, the river would be orange."

Today, he says, the Pemigewasset, Winnepesaukee and Merrimack rivers are thriving: "They all have rainbow, brook and brown trout in them. Atlantic salmon were stocked in the Merrimack River close to where we discharge until last year when the government ended the program."

The Franklin plant goes beyond its treatment function in helping protect the rivers. The team supports the Upper Merrimack Monitoring Program by taking water samples upstream and downstream from the plant. In addition, the plant lab runs *E. coli* tests at no charge on samples taken each year by volunteers from 17 sampling sites on the river.

Plant team members and other volunteers also place rock baskets in the river above and below the outfall for several weeks each summer. Macroinvertebrates that colonize the rocks are later counted and identified to help create a comprehensive, long-term picture of the river's health.

#### INSPIRING OTHERS

In his spare time, Noyes serves on the five-member state certification committee for wastewater operator licensing. The committee interviews all licensees who

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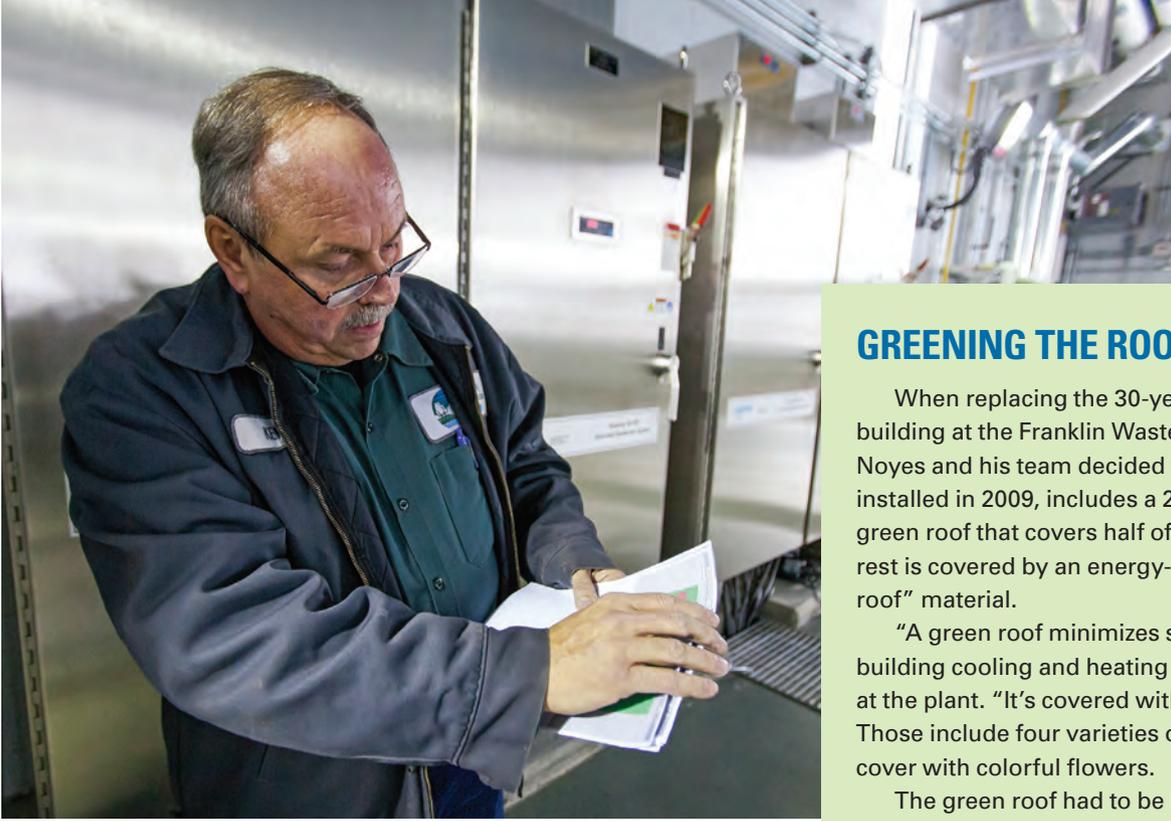
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Noyes came to the Franklin plant with experience working with an electronics company in roles that included industrial pretreatment. He began his wastewater career as a second-shift operator.

## GREENING THE ROOF

When replacing the 30-year-old original roof on the main building at the Franklin Wastewater Treatment Facility, Ken Noyes and his team decided to go green. The new roof, installed in 2009, includes a 200- by 75-foot section of vegetated green roof that covers half of the flat roof's total surface. The rest is covered by an energy-efficient, reflective white "cool roof" material.

"A green roof minimizes stormwater runoff and helps reduce building cooling and heating loads," says Noyes, chief operator at the plant. "It's covered with plants native to New Hampshire." Those include four varieties of sedum, a quick-growing ground cover with colorful flowers.

The green roof had to be limited in size because the gravel base and soil place a heavier load on the structure than a conventional roof. "It does look pretty when the plants flower," Noyes says. "It's built with cups that collect rainwater to sustain the plants through short dry spells. We water it every couple of weeks if we're not getting enough rain."

At the time of the green roof project, the main building also received a lighting upgrade to high-efficiency fluorescent lamps.

“The people who work in this industry are some of the best, in my book. I haven't met a bad operator in the wastewater field.”

**KEN NOYES**

pass Grade II and above, and Noyes uses that as a chance to offer a little inspiration. "I tell them I love the job I'm doing," he says. "I tell them there are a lot of opportunities in the wastewater field: operations, lab, electronics, electrical, maintenance. It's a big, diverse, great career. I can tell you there are some nice treatment plant operators coming up through the ranks.

"I also love giving tours of the treatment plant. People are always amazed at what happens here. Most people never give it a thought of what happens after it leaves their house."

As a member of the New Hampshire Water Pollution Control Association, Noyes takes opportunities to visit other plants: "Four times a year we have functions where we go meet other operators. If ever I have a question about some piece of equipment, I can call anyone in the state who has that same equipment and they'll tell me the truth. That's what's nice about the network.

"The people who work in this industry are some of the best, in my book. I haven't met a bad operator in the wastewater field." **tpo**

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# The Daily Grind

A NEW VENTURE LOOKS TO ACCELERATE CO-DIGESTION OF FOOD WASTE AS A WAY TO DIVERT ORGANIC MATERIAL FROM LANDFILLS AND INCREASE RENEWABLE POWER GENERATION

By Ted J. Rulseh

Clean-water plants looking to boost biogas and energy production often explore co-digestion — adding food waste or other organic material to their anaerobic digesters.

Now, a Wisconsin company has launched a venture that takes a unique approach to co-digestion, essentially bringing sources of food waste and digester/energy producers together.

Grind2Energy is a business of InSinkErator, a manufacturer of the food waste disposers found under homeowners' kitchen sinks and in the kitchens of commercial food establishments. The company offers a service in which a grocer or other business uses a commercial disposer to grind up food waste otherwise put in the trash and hauled to a landfill.

Instead, the ground-up material in slurry form is stored in a tank and later pumped out and trucked to a wastewater treatment plant or privately owned, stand-alone digester. Michael Keleman, manager of environmental engineering, marketing and business development, says the offering has a dual benefit in diverting organic waste from landfills while helping clean-water plants generate more biogas and more energy to help offset their operating costs.

Before joining InSinkErator eight years ago, Keleman was in the wastewater treatment profession for nearly 20 years, much of that time in plant superintendent jobs in Indiana. He still holds an Indiana Class 4 (highest) municipal wastewater treatment plant operator license, an Indiana Class C industrial wastewater license, and a Wisconsin Grade 2 wastewater operator license. Keleman talked about Grind2Energy in an interview with *Treatment Plant Operator*.

**tpo:** Why is it important to divert food waste and other organic waste from landfills?

**Keleman:** Organics in landfills result in emissions of the greenhouse gas methane. Landfills do a pretty good job of capturing that methane. The EPA Landfill Methane Outreach Program says about 600 landfills in the U.S. capture methane for energy. But when you put food waste in the garbage, it takes several days before it's collected. Then it goes to a landfill where it may be weeks before it is covered. So most of the organic material

“So far, the treatment plants that are accepting our food waste slurry simply say, ‘We want more of this.’ It has very high volatile solids content, greater than 90 percent, and it's rapidly biodegradable.”

**MICHAEL KELEMAN**

decays before the methane can be captured. If you send that material to the sewer through a food waste disposer, it reaches the treatment plant within a few hours. It settles out in primary treatment and then can be converted to energy and soil amendment in anaerobic digesters.



Michael Keleman (right) of Grind2Energy confers with James Olivas on a grocery store customer site.

**tpo:** Do you see a trend toward more diversion of organic wastes?

**Keleman:** Yes. There is a mega-trend toward diverting food waste from landfills and incinerators. It started in the European Union where they have a lack of space for landfills. Canada has many mandates focused on keeping organic waste out of landfills. Now states like Massachusetts, Connecticut, Vermont, Rhode Island and California are following suit.

**tpo:** How do food waste disposers fit into this picture?

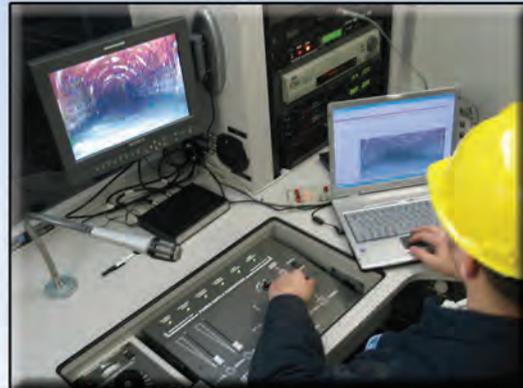
**Keleman:** About 50 percent of food waste comes from residential sources. The other 50 percent comes from commercial, institutional and industrial sources. Massachusetts now mandates installation of at least one disposer in commercial locations serving at least 20 patrons. Philadelphia last December passed a mandate requiring residential disposers in all new construction. This suggests that commercial disposers should be embraced as one opportunity to manage organic waste.

(continued)

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**tpo: Why can't commercial food waste generators just install commercial disposers and send their material into the sewer system?**

**Keleman:** If you are generating 1 ton or more of food waste per week, that's quite a bit of material. Generally, using a commercial food waste disposer requires the use of up to 7 or 8 gpm of water while grinding to transport that material through the sewer. Grind2Energy uses 1 to 2 gpm to create a slurry that is pumpable and suitable for anaerobic digesters.

**tpo: What kinds of establishments tend to generate that volume of food waste?**

**Keleman:** Grocery stores certainly produce more than 1 ton per week. So do sporting venues, hotels, casinos and food courts. Restaurants typically don't produce that much.

**tpo: In basic terms, how does the Grind2Energy service work?**

**Keleman:** We focus on areas where there are landfill mandates, to give those businesses an opportunity to divert material from the landfill. They process the waste in a 10 hp commercial-grade food waste disposer. The slurry is placed in a holding tank and ultimately removed and hauled by a vacuum truck directly to a digester. We contract with the haulers. Instead of selling the system at a capital cost to the customer, we enter a two- to three-year agreement where we charge them a monthly fee for the installation, maintenance, pumping, hauling and tipping fees at the digester, if any.

**tpo: Is this cheaper than putting the material in a dump container and hauling it to a landfill?**

**Keleman:** It can be, especially in jurisdictions where landfill tipping fees are \$100 to \$150 a ton, as in places like Massachusetts.

**tpo: Other than to save money, why would a food business sign up for this service?**

**Keleman:** Resource recovery can be a big part of a public relations message. They can tell customers they're recovering resources by turning their waste into energy and fertilizer. Also, if you've ever walked outside a large commercial food enterprise where they have their dump containers, there are always odors, and there are pest issues. In our process, the material is contained in a vessel. The other benefit is labor savings. Instead of carting the material outside, they stand at a table and grind the waste and it's gone.

**tpo: What motivates treatment plants to accept the material?**

**Keleman:** There is another mega-trend, promoted by the Water Environment Federation, to rebrand treatment plants as water resource recovery facilities. Progressive plants see an opportunity to use their digesters to boost biogas production, create energy to offset their costs, and in some cases become energy independent or even net energy positive.

It's also an opportunity to generate revenue from tipping fees.

**tpo: What are the obstacles to getting this material accepted at treatment plants?**

**Keleman:** Almost every treatment wants to have its own evaluation. When we first call on them, they want a lab report. They want to see a sample of the material and have a sit-down discussion. There's a perception that co-digestion will significantly increase the amount of biosolids they have to manage, so they have to evaluate that as well. They also need a receiving station — a way of blending the material directly into their digesters. And they have to establish a tipping fee for accepting the material.

**tpo: Are treatment operators concerned about upsetting their digesters?**

**Keleman:** To operate an anaerobic digester you have to keep the volatile-solids-to-alkalinity ratio in line. Food waste slurry does increase the volatile fatty acids, such as acetic acid, which is the building block for pro-

ducing methane. If you were to overfeed the digester too quickly, you could go acidic, kill off the methane-generating bacteria and compromise your ability to process biosolids. However, a co-digestion study published a couple of years ago by the Water Environment Research Foundation said that until you get over the 25 percent hydraulic loading rate with outside organic waste, the risk is minimal.

**tpo: What effect does accepting your material have on biosolids volume?**

**Keleman:** In the range of 30 percent of the dry solids from food waste could become biosolids. So it's not a significant incremental amount. In fact, there is some synergy to adding organic waste that has a high carbon-to-nitrogen ratio to sewage sludge in a digester, in that you get improved volatile solids destruction. We're doing research at Western University to quantify that synergy, to show just how much incremental biosolids really is produced.

**tpo: What is the reaction to your material from treatment plants that have accepted it?**

“We have nearly 40 installations at commercial food service establishments. ... That includes nine in the Massachusetts area, several in Cleveland and Columbus, Ohio, and 15 in southeast Wisconsin. Right now, we are delivering slurry to nine digesters.”

MICHAEL KELEMAN

**Keleman:** So far, the treatment plants that are accepting our food waste slurry simply say, 'We want more of this.' It has very high volatile solids content, greater than 90 percent, and it's rapidly biodegradable. The methane potential testing we've done in-house shows that the organics are converted to methane in five to 10 days. It doesn't take the 20- to 30-day detention time that a digester normally requires to process wastewater sludge.

**tpo: How extensive is your network of food business customers and digesters?**

**Keleman:** We have nearly 40 installations at commercial food service establishments, mainly supermarkets. That includes nine in the Massachusetts area, several in Cleveland and Columbus, Ohio, and 15 in southeast Wisconsin. Right now, we are delivering slurry to nine digesters. We deliver to the Nine Springs Wastewater Treatment Plant in Madison, Wisconsin, the South Shore Water Reclamation Facility in Milwaukee and the Downers Grove Wastewater Treatment Plant in Illinois. The others are stand-alone digesters.

**tpo: What does your team at Grind2Energy consist of?**

**Keleman:** My colleague Casey Furlong is an environmental specialist and worked in solid waste management operating landfills for over 15 years. We have a team of engineers who design our systems. We have a service department that monitors the tank levels and schedules the pickup and hauling. We also have a sales team. I attend trade shows and conferences to stay on top of the latest trends and technology in the wastewater space. I get to communicate with a lot of wonderful wastewater treatment professionals.

**tpo: Do you have a concluding message for the operator community?**

**Keleman:** Most people in the United States take the food waste disposer in their kitchen sink for granted. They probably don't think twice about where that material goes. The idea that they could use their disposers to reduce what they send out to the curb and to the landfill, and help their local treatment plant become more energy independent — that is something I wish more operators would talk about. **tpo**

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# Safety, End to End

THE DESIGN OF THE AWARD-WINNING HIDDEN LAKE WATER TREATMENT FACILITY IS AIMED AT SAFEGUARDING PUBLIC HEALTH AND LIMITING THE RISK OF WORK ACCIDENTS

STORY: **Jim Force** | PHOTOGRAPHY: **Amy Voigt**



John McConnell, field service representative, tests water samples in the lab on a Hach DR3900 spectrophotometer.

**IT'S PUBLIC AND EMPLOYEE SAFETY FIRST AT THE** new Hidden Lake Water Treatment Facility and distribution system serving Warsaw and Winona Lake, Indiana.

The new facilities, owned and operated by Indiana American Water, ensure an adequate supply of safe water for the communities' customers, which include Warsaw's growing orthopedic appliance industry.

Improvements in disinfection are designed to protect the safety of plant operators. Emergency generators guarantee power in the event of storms or other outages. And modifications to the supply system give the community more than adequate pressures for firefighting and new development. The project was commissioned in October 2011.

"From the initial design stage, our highest priority was safety — to eliminate injuries to our staff, protect our community and make our operation disaster-resistant," says Chris Harrison, operations superintendent. All three objectives have been met.

### NOT-SO-GOOD OLD DAYS

The good old days weren't exactly that where Warsaw's water treatment was concerned. The previous system owner operated four water treatment plants, which at one time drew raw water from an area lake. "These were old iron and manganese filters, dating to the late 1950s and 1960s," says Harrison. "They were way past their useful service life."

Not only that, the former facilities failed to produce the high-quality finished water needed for the community's orthopedic industry, let alone other users. "Warsaw is the orthopedic capital of the world," says Harrison. "Manufacturers need clean water to wash down parts and implants like artificial hips and knees. Our water is treated further in their on-site reverse osmosis and ion exchange systems. With the old system, the iron and manganese suspended in the water created all kinds of havoc in their operations."

In addition, the distribution system was not capable of reliable pressures to meet the demands of fire service and further community development. Oddly, the system was segregated into four separate pressure zones, even though the terrain in the service area is relatively flat.

“From the initial design stage, our highest priority was safety — to eliminate injuries to our staff, protect our community and make our operation disaster-resistant.”

**CHRIS HARRISON**

## Hidden Lake Water Treatment Facility (serving Warsaw and Winona Lake, Indiana)



COMMISSIONED: | 2011

POPULATION SERVED: | 17,500

SOURCE WATER: | St. Joseph and Wabash River tributary outwash aquifer

PLANT PROCESS: | Pressure filtration

CAPACITY: | 6 mgd (upgradable to 9 mgd)

SYSTEM STORAGE: | 2 million gallons

DISTRIBUTION: | 2 booster stations, 90 miles of water main

GPS COORDINATES: | Latitude: 41°16'1.42"N; longitude 85°51'36.61"W

WEBSITE: | [www.amwater.com](http://www.amwater.com)

Finally, some of the old facilities were in the floodplain.

The first thing Indiana American Water did was conduct a comprehensive planning study to identify the water needs of the growing community and its industries. The study team conducted flow modeling and developed the details of needed distribution system improvements. Then, an in-house design team visited four other American Water facilities, including design-build projects, to gather design ideas.

“Our engineers and the design team walked through the process and came up with a design that is sustainable, disaster resistant and upgradable,” Harrison says. The design accounted for anticipated growth, which is averaging 70 to 120 new service connections a year.

“Proper planning up front helps with infrastructure solutions,” says Harrison. “We looked at the demand, analyzed the water-quality issues and came up with a resolution.”

The \$25 million treatment facility and distribution improvements were constructed under a design-build contract, led by the engineering firm of Hazen and Sawyer and



## ENVIRONMENTALLY SENSITIVE

The new Hidden Lake Water Treatment Facility and its distribution system are designed with safety in mind, and the same guide applied to the siting of the project in the first place.

The U.S. Army Corps of Engineers and the Indiana Department of Environmental Management expressed early concerns that the treatment facility and groundwater wellfield could harm endangered clubshell mussels and negatively affect river flows and adjoining forested wetlands, especially during drought conditions.

According to Indiana American Water’s Chris Harrison, plant operations superintendent, the mussels lived in an area originally planned for discharge from the plant’s backwash water lagoons. When a study identified several species of mussels in the receiving stream, the plans were changed to move the outfall downstream to an area with unsuitable mussel habitat.

“Additionally,” says Harrison, “the lagoon outfall piping was directionally bored to mitigate any disturbance of the natural surroundings.”

The Corps and Indiana American Water conducted hydrogeological studies to determine the effect of pumping up to 1 million gallons of raw water daily from the new wellfield near the river. The conclusion was that the aquifer could sustain the withdrawal, especially since five existing wells were being shut down.

Says Harrison, “It was a big win in managing our natural resources and being responsive to our customers.”

Chris Harrison, left, operations superintendent, and John McConnell, with the plant’s on-site sodium hypochlorite generation system (Process Solutions).

contractor River City Construction. The project took just one year from groundbreaking to completion and received a Water/Wastewater National Award of Merit from the Design-Build Institute of America. The treatment plant is also LEED-certified.

## UPGRADED TREATMENT

In the new treatment process, raw water is drawn from six wells in a new wellfield constructed with environmental impact top-of-mind. At the plant, the water is aerated and then pumped through four new two-cell pressure filters, designed by American Water, to remove iron and manganese. The design includes multiple options for chemical feeds if necessary.

The filter train is expandable to six units, according to Harrison, and the piping arrangement can also be expanded to bring plant capacity to 9 mgd from the current 6 mgd. Actual flow at present is just under 3 mgd.

The filters are equipped with automatic backwash systems controlled by the plant’s new SCADA system, designed by Langtech. “Before, the old filters were backwashed manually,” says Harrison. “Now we’re seeing runtime of up to 120 hours between backwashes. That cuts down on the amount of non-revenue water. The new SCADA system automatically starts the backwash cycle according to the setpoints we establish in the programming.”

The plant’s safety theme carries over to the disinfection process, which uses on-site generation of sodium hypochlorite (Process Solutions) in place of chlorine gas. “In opting for on-site generation, we anticipated an increase in chemical costs,” says Harrison. “So far, though, we haven’t really seen an increase.” Finished water is stored in a 1.1-million-gallon clearwell (DN Tanks).

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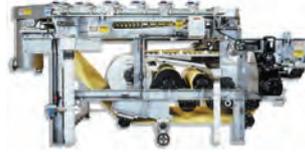
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- produce Class A product
- high efficiency



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- high cake solids
- low polymer cost



### Gravity Belt Thickener

- sludge thickening
- high rates
- low polymer cost



### Dissolved Air Flotation

- sludge thickening
- wastewater clarification
- high float solids



### Rotary Vacuum Filter

- sludge dewatering
- wastewater clarification
- continuous operation



### Plunger Pump

- sludge transfer
- positive displacement
- high suction lift



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### EFFICIENT DISTRIBUTION

In the distribution system, variable-frequency drives (VFDs) efficiently maintain pressure, and the impact shows up in low energy costs and improved operational control. When compared to the old system, Hidden Lake sees an average electric bill reduction of \$1,500 per month by staying within the pump curve, and controlling the tower height using the VFDs.

“We reduced the number of needed pressure zones from four to two,” Harrison says. “Warsaw is basically a swampy area. There originally were four different gradients in the system, and with the changes we made, there was no need to continue that. With proper planning, we were able to combine three existing zones into one, tear down one elevated tower and raise the west tower by 32 feet.

“The VFDs on our pump motors (US Motors – Nidec Motor Corporation) run according to the height of the water in the tower. We were able to maximize our resources by operating at seasonal fill rates.” Stag-

Carl Slone, field service representative, does utility locating at an apartment complex being built in Warsaw.





Chris Harrison,  
operations  
superintendent

ing of the levels in the towers is based upon meeting daily demands and maintaining the fire flow requirements in the system.

In addition, by combining three pressure gradients into one main zone, pressure has increased by 13 to 15 psi throughout the distribution system. “That enhances our fire flow, which helps meet our design criterion of 3,500 gpm for three hours of continuous fire flow to our industrial and commercial customers,” Harrison says.

“We show up with a cup of coffee and go over what actions are required for that day, what problems we foresee.”

**CHRIS HARRISON**

Security is heightened, as well. The design of the new tanks allows for the delivery of bulk chemicals just twice a year, eliminating the old manual process of transferring 55-gallon drums each month and avoiding back strains and other injuries.

The new SCADA system monitors and controls the entire operation and is a boon to efficiency and security. “It’s a very useful tool,” Harrison says. “We can now monitor our efficiency and even see if someone is tapping into a hydrant. We can monitor the towers, the high-service pumps and the entire operation from our desks. Staff can communicate better. We never had that resource before.”

In the field, modifications have been made to the community’s 90-mile-

### IN-PLANT SAFETY

Chemical storage and handling is also improved at the facility. “Each chemical room was designed to eliminate or reduce slips, trips and falls, and to provide ease of access for the staff while transferring chemicals or calibrating feed rates,” Harrison says. Each room is also equipped with large, insulated translucent panels that admit natural light. The panels are removable in case a bulk storage tank should fail.



Lab analysis helps keep plant processes in control.

long distribution system. More than 9,000 linear feet of new and replacement water main has been installed. The projects included 100-year-old infrastructure that had performed well but needed an upgrade to meet the growth in the communities. Upgrades were executed with a combination of open-cut excavation and directional drilling.

Some of the new mains have been looped, providing redundancy to ensure pressure in areas where water was historically supplied from a single direction. Finally, Warsaw has upgraded its metering system to all radio reads, replacing a system of manual readings and touch pads.

### SAVVY STAFF

The staff at Hidden Lake is small, but skilled in a variety of areas. Harrison’s team includes Brenda Sumpter, operations support representative, and Carl Slone, John McConnell and Adam Hudson, field service representatives. “This is a high-tech facility,” says Harrison, who started in the clean-water field 33 years ago, as a 17-year-old painting curbs. “Our employees are trained in both plant and distribution system operation, with expertise in mechanics and computers. The learning curve was short once they became familiar with the operation.”

Besides being computer-savvy, operators need to know how to run the equipment in case the control system should fail. That’s one of the reasons Harrison holds weekly “splash” meetings, as well as tailgate talks each morning. “We show up with a cup of coffee and go over what actions are required for that day, what problems we foresee,” he says. “The talks help us communicate. The priority is safety. We haven’t had a lost-time accident here in 13 years.”

And the new facility actually helps the communications process. “Before we upgraded, operations were dispersed throughout the community. The office was in one place, the distribution center was across town and treatment was at four different plants.”

Now everything is under one roof, enhancing teamwork, time management and water quality. And, of course, safety. **tpo**

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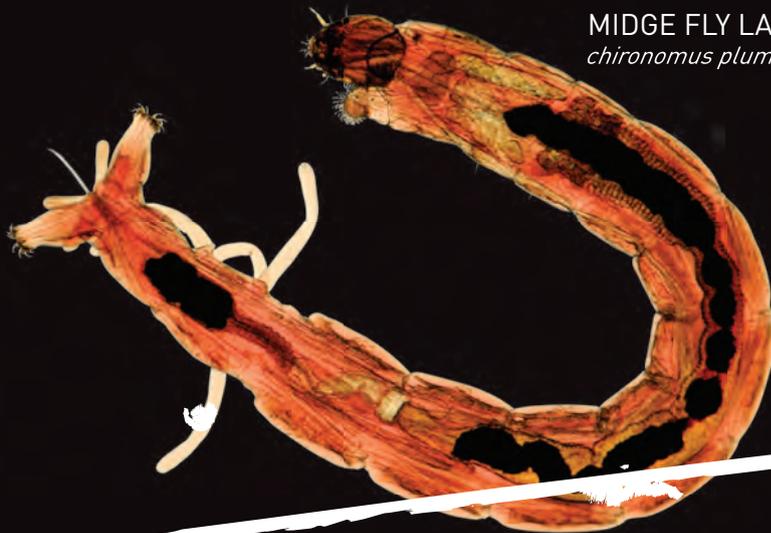
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Sean Phillips, engineering manager for Deep Trekker, demonstrates a DTG2 ROV camera inspection system for two interested WWETT Show attendees. The unit allows users to inspect tank walls and underwater components without having to enter or drain the tank.



PHOTO BY CRAIG MANDLI



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# Remote Inspection

ROBOTIC-STYLE UNDERWATER VEHICLE ENABLES THE EASY INSPECTION OF WATER TANKS

By Craig Mandli

**W**hat do you do when your coagulation tank springs a leak, you need to check a valve, or you simply want to see what may be clogging up the bottom of your sedimentation basin?

Typically, the answer is to call out scuba divers or drain the whole tank. However, one alternative is slowly making the jump from the fish farm industry to the municipal water and wastewater treatment plant crowd — remotely operated underwater vehicles (ROVs). One easily handled option, manufactured by Deep Trekker, drew a crowd to the company’s demonstration tank on the floor of the 2016 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show.

The Deep Trekker DTG2 ROV comprises two die-cast aluminum sides separated by a 360-degree polycarbonate window, through which the camera can look out. Double O-ring seals keep the water out, and the unit is completely self-contained.

“We are talking with tank manufacturers, municipal contractors who do tank work and basically any individuals who perform tank inspection,” says Sean Phillips, engineering manager. “We originally marketed this product to the fish farm and pleasure boat construction industry but have gotten more and more inquiries from potable water tank inspection folks. That’s our biggest reason for coming to WWETT this year.”

The camera can rotate through 270 degrees in the vertical plane and can be rotated to see both below and above the vehicle, and behind it to a limited degree. Panning the camera is accomplished by turning the ROV to the left or right using the thrusters mounted on each side. To see behind, the pilot can pitch the ROV body and look straight back.

“The controls are very similar to an Xbox video game controller,” says Phillips. “Not only does the ROV perform a needed service, the operators actually have fun doing it.”

Rechargeable batteries that power all the electronics and the camera are all located inside the hull. The full unit weighs slightly less than 19 pounds and is rated to depths between 330 and 500 feet, depending on the model chosen. The unit’s depth is controlled using the two thrusters and an internal pitch control system. Adjustable ballast weights are located externally, allowing the

unit to stay in a fixed submerged plane even in moving water.

Units are designed to capture or manipulate objects below the surface and come with 164 to 500 feet of tether cable, an integrated screen controller and a cable reel. An optional two-function grabber arm can pick up all sorts of objects one might find at the bottom of a tank. It also allows operators to perform minor repairs or retrieve water samples. Heavier objects can be retrieved by locking the grabber onto them, and hauling both the ROV and object back to the surface by tether. Other options include a CHIRP sonar package that enables the ROV to be operated in low visibility, a thickness gauge, navigation sensors and auxiliary lighting to complement the standard lighting system.

Deep Trekker markets the DTG2 ROV as a versatile system. Besides municipal water treatment and fish farms, sales have been made to commercial divers, pipeline operators, underwater construction firms, search-and-rescue teams and environmental monitors.

“We have units in several West Coast municipalities, and NASA even bought one for tank testing and inspection,” says Phillips. “I would say the vast major-

“We have units in several West Coast municipalities, and NASA even bought one for tank testing and inspection.”

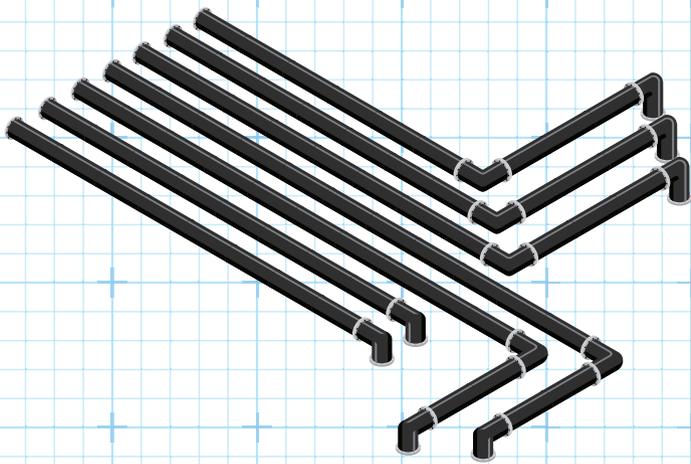
SEAN PHILLIPS

ity of our customers perform very niche duties involving underwater inspection or exploration. That’s why we felt it was a fit for this show.”

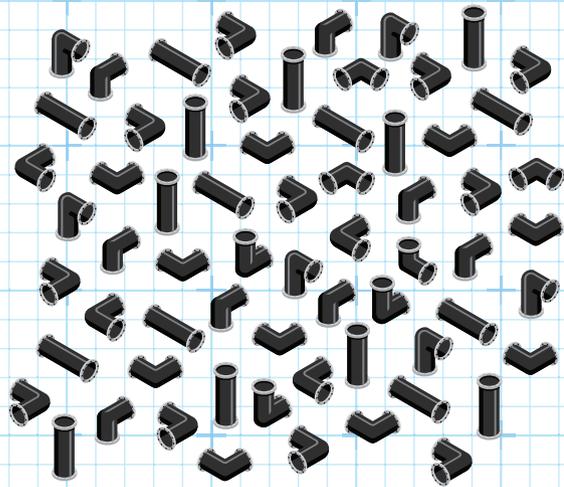
The interest level was actually higher than expected for the first-time WWETT exhibitors, as the company sold five DTG2 ROV units right on the show floor. The interest in the ROV surprised Phillips, who came into the week thinking the company’s submersible crawler camera system would garner the majority of the interest.

“I would say the number of attendees who deal with tanks and tank inspections at this show was a surprise,” he says. “We did get a lot of great leads on the crawler system, but the interest in the ROV was just phenomenal. That leads me to believe that this show and this market is a great opportunity for Deep Trekker.” 519/342-3177; [www.deeptrekker.com](http://www.deeptrekker.com). tpm

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# Bypass Minus Pump

AN EQUIPMENT RENTAL COMPANY FINDS A CREATIVE SOLUTION FOR BYPASSING WASTEWATER DURING REPAIR OF A DETERIORATED PIPE AT A TREATMENT PLANT

By **Scottie Dayton**

A leak in the 30-inch ductile iron pipe (DIP) feeding the headworks at the Punta Gorda (Florida) Wastewater Treatment Plant turned into a rehabilitation project for the city. The contractor patching the leak found he could put a finger through the deteriorated pipe.

Thomas Traina, P.E., with King Engineering designed the upgrade and solicited help in design of a temporary bypass from the Tampa location of Sunbelt Rentals. “Our investigation determined the treatment system had less than 2 feet of head pressure,” says Eric Eaton, Sunbelt sales development manager. “However, the difference in elevation was sufficient to do a pipe-only bypass instead of relying on temporary pumps.”

It took almost a year to complete the bypass plan, which Michael Crow-



Flow from the aeration basins transfers by way of a 24-inch pipe to 18-inch lines that discharge to the east and west clarifiers at the back of the plant. In the background is the 18-inch crossover pipe that is used to help equalize the clarifiers during elevated flows.

PHOTOS BY ERIC EATON

“Our investigation determined the treatment system had less than 2 feet of head pressure. However, the difference in elevation was sufficient to do a pipe-only bypass instead of relying on temporary pumps.”

**ERIC EATON**

ley, P.E., president of CAA Engineers, then stamped as required. “Mike normally just reviews all our large bypass calculations, but it was especially important because of this unique design,” says Eaton.

Before the bypass, scale and debris from the deteriorated pipe hindered flows and often reduced the plant’s efficiency. After the bypass went online in June 2014, operators noticed the plant ran better and was easier to control.

## COORDINATED LABORS

The 12 mgd (design) activated sludge plant treats an average of 4 mgd. Poole & Kent Company of Florida won the bid to replace the ductile iron piping from the connection to the 12-foot-high headworks to the four aeration basins, and from there to the four clarifiers. Asif Shaikh, Poole’s project manager, hired Sunbelt to install the bypass.

“We worked closely with Asif to coordinate our efforts and complete the project during Florida’s dry season,” says Eaton. “Even before the start date, we were fusing 50-foot sticks of 18- and 24-inch HDPE SDR

26 pipe (Performance Pipe) at the plant.” The longest run was 250 feet of 24-inch pipe from the headworks to the west aeration basins. The 18-inch discharge lines to the tanks were 10 to 15 feet and 20 to 25 feet long.

The headworks connection was a 30-inch underground tee to which Poole installed a universal MEGALUG mechanical joint followed by a short length of 30-inch DIP and an adapter ring for a 150-pound flange (weight designated a 20-bolt pattern). When Eaton received permission to move in, his four-member team mounted a 30-inch to 24-inch reducer on the flange and connected the temporary 24-inch line.

The Sunbelt crew used two 8,000-pound-capacity forklifts and one 6,000-pound-capacity forklift to position the pipe sections in the fusion machine and move the fused lengths around the site. “Even pipes this large have a little friction loss through bends and tees,” says Eaton. “Therefore, it



An 18-inch knife gate valve controls the flow from the 24-inch pipe feeding an 18-inch line to a clarifier.

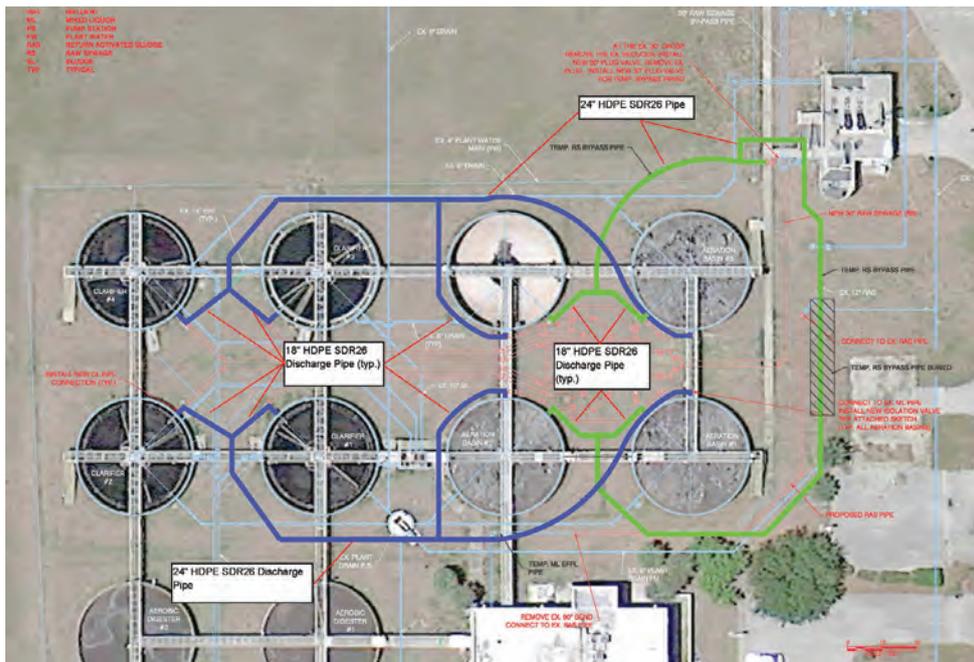
was critical that the runs lie flat with minimum direction change to avoid any further friction loss.”

### ATTENTION TO DETAILS

Each pipe had an HDPE saddle to compensate for contraction during temperature and pressure changes. The clamps had a threaded connection and an O-ring. “We drilled through the connection, then used the hole to install vents or use as a port to inject water,” says Eaton.

His crew installed 18-inch knife gate valves (all identical valves from Orbinox) with 16 bolts per flange where the 24-inch pipes transitioned to the smaller discharge lines. “That enabled operators to take aeration basins or clarifiers out of service during low flows and send it all to one side,” says Eaton. They also closed the valves and pressure-tested the 24-inch system to 20 psi. The joints were perfect.

Poole’s team needed access to the area between the east and west clarifiers to build a concrete distribution box. To ensure an unobstructed path, Eaton’s team excavated a 3-foot-deep trench in front of the aeration basins and buried the section of 24-inch pipe running in front of them. Steel road



An overall view shows how the bypass is tied to four aeration basins and four clarifiers.

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ramps placed over the trench allowed heavy equipment to cross it. “We also routed the bypass around the outside of the tanks to keep the center aisle open,” says Eaton.

Once the pipes were laid out and during low-flow conditions, operators closed the feed lines to the tanks and drained them as needed. While Poole removed the existing tees 6 feet above grade for the tank’s feed line and air vent, Eaton’s crew added a 24-inch tee from the main bypass line to between two basins. They inserted a 24-inch to 18-inch reducer and valve at the ends of the tee, and connected them to short lengths of 18-inch pipe extending to the tanks.

“We vented our system to mimic the original piping,” says Eaton. “Because we had isolating valves, we turned on the bypass as each tank was hooked up.” To help equalize the system during elevated flows, workers fused an 18-inch crossover pipe with valves and left it behind clarifiers 2 and 4 for Poole to hook up if needed. The bypass took three weeks to install.

### KNOCKDOWN

Poole completed the project months ahead of schedule. Eaton’s team decommissioned the bypass in less than three days. They flushed the pipes with effluent, drained the system, then attached a pump to the saddle on the short length of 30-inch DIP on the underground tee, and pumped out any residual water.

“They unbolted the flanges where possible, or sawed them out with a chain saw and removed the bolts at the shop,” says Eaton. “The pipe was sawed into 50-foot lengths and hauled home to use again.” tpo



# Mouse Power

A WETLAND SHAPED LIKE AN ENDANGERED SMALL MAMMAL PROVIDES EFFLUENT POLISHING AND WILDLIFE HABITAT IN PETALUMA, CALIFORNIA

By Jeff Smith

The image of an endangered species has a major presence at the Ellis Creek Water Recycling Facility in Petaluma, California. A constructed wetland consisting of four ponds in the shape of a mouse covers more than 30 acres and serves as a polishing filter for the 8 mgd (average) advanced treatment plant.

“The architect designed the polishing wetlands in the shape of the endangered salt marsh harvest mouse,” says Matt Pierce, operations supervisor. “From an aerial shot, you can see what looks like an outline of the mouse.”

## BIRD SHELTERS

The wetland ponds are separated by earthen berms that define the mouse’s image. Each pond has small islands that shelter nesting birds and direct the flow toward the outfall at the Petaluma River. A walking trail that represents the mouse’s tail connects the wetlands to a water conservation garden and a 1.8-million-gallon concrete-lined reservoir near the plant.

The facility recycles about 40 percent of its effluent for reuse (100 percent during summer). Two golf courses, the city parks, nearby farmland and a vineyard are the primary users. The facility uses its own reclaimed water year-round for landscape irrigation, fire protection, plant process water and toilet flushing.

## ADVANCED PROCESS

Wastewater receives several stages of treatment before it reaches the

ABOVE: Overhead view of the plant showing the mouse-shaped polishing wetlands near the top and in relationship to the rest of the facility.

mouse-shaped wetlands. After conventional treatment and time in an aerated lagoon, effluent flows for about a month through eight 18-acre oxidation ponds, ending in a separate treatment wetland populated with bulrushes.

Three 50 hp submersible pumps (Flygt – a Xylem brand), controlled by a flow setpoint in the SCADA system, deliver water from the treatment wetlands to either the polishing wetlands or the tertiary treatment process for advanced treatment before reuse.

“We are proud of our facility. It was designed to meet ever-increasing performance standards in a sustainable manner. It also benefits the community in terms of wildlife habitat and recreational opportunities.”

MATT PIERCE

Petaluma began recycling in the 1980s by pumping effluent into the oxidation ponds from a treatment plant that was decommissioned and replaced by the Ellis Creek Facility in 2009. The ponds were retained and the polishing wetlands were added. “The oxidation ponds are off-limits to the public, but the polishing wetlands are accessible and very popular,” Pierce says.

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View of the green roofs on the administration and maintenance buildings (foreground) and the 1.8-million-gallon reservoir, both surrounded with water conservation gardens. The walking trail that represents the tail of the mouse-shaped polishing wetlands meanders from the wetland to the reservoir.

### RICH ENVIRONMENT

Hikers, bicyclists and bird watchers enjoy more than 4 miles of trails that traverse the wetlands. A variety of birds including pelicans, egrets, herons, sandpipers, red-tailed hawks and marsh wrens call the wetlands home. Western pond turtles are also found there, and swans and Canada geese frequent the oxidation ponds.

A connecting trail at the wetlands leads to more than 7 miles of additional trails that link to a city park, a marsh and the Petaluma River. The trail system provides public access to nearly 230 acres of wildlife habitat used for educational programs, nature study and tourism.

### TOP OF FORM

To demonstrate sustainability, two green roofs were part of the Ellis Creek construction project. With a combined area of nearly 13,000 square feet, the roofs of the administration and maintenance buildings were planted with more than a dozen species of ground cover. Birds including killdeer have used the roofs for nesting.

Both green roofs are irrigated with recycled water from the facility's holding pond. Stormwater overflow from the roofs drains into ground-level rain gardens and bioswales, visible from nearby roads and the wildlife viewing areas. Vines cover the façade of the buildings. One green roof was used to support a university professor's native bee study research, investigating the ecological importance of living roofs in relation to native bee populations.

"We are proud of our facility," says Pierce. "It was designed to meet ever-increasing performance standards in a sustainable manner. It also benefits the community in terms of wildlife habitat and recreational opportunities." **tpo**

### Share Your Ideas

**TPO welcomes news** about interesting features of your facility's grounds, signage or buildings for future articles in the PlantScapes column. **Send your ideas to editor @tpomag.com or call 877/953-3301.**



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# New Technology Slated for ACE16

By Craig Mandli

The AWWA's Annual Conference and Exhibition brings together experts from around the world to exchange ideas about water, the world's most important resource. More than 500 exhibitors from all aspects of the water industry will present and discuss solutions for the most pressing water utility challenges. This year's event, slated for June 19 to 22 in Chicago, Illinois, promises to show off some of the finest new products on the market to help municipalities perform asset management, implement potable reuse solutions, address water loss in distribution systems, and respond to harmful algal blooms in surface water, among hundreds of other solutions. Below is a smattering of some of the newest products that will be highlighted at this year's show.

## AdEdge H2Zero Backwash/Recycle System

### H2Zero Backwash/Recycle Systems

from **AdEdge** help conserve water by storing and treating contaminated backwash water from filtration and treatment systems. Systems can be customized and designed for most manufacturers' adsorption, oxidation/filtration or coagulation/filtration systems, whether backwashing is infrequent or performed one or more times per week. They include a vertical polyethylene or a steel tank for holding the backwash water, a reclaim pump skid, integrated controls, particle filtration as well as information data for solids management. They provide optimal use and maximum conservation of water, regulatory agency acceptance, an environmentally friendly solution that requires little or no permitting and a reclaim system that can be automated for minimal operation and maintenance.

866/323-3343; [www.adedgetech.com](http://www.adedgetech.com); Booth #678



## Analytical Technology Q46S/66

The **Q46S/66 Auto-Chem Sulfite System** from **Analytical Technology** takes measurement to a new level, employing a gas-phase method that continuously monitors sulfite without contact between the sensor and the water sample. This air-stripping method in operation works by mixing the sample with an acidic solution converting the sample into a sulfur dioxide gas. This gas is then stripped from the sample. Using a special sulfur dioxide gas sensor, a gas-conditioning module prepares the gas sample for measurement. Sensor signals are then amplified and displayed on a large-format, backlit LCD display in the systems electronic unit.

800/959-0299; [www.analyticaltechnology.com](http://www.analyticaltechnology.com); Booth #1340



## Blue-White Industries Proseries-M M-2

With smooth and quiet variable speed pumping action, the **Proseries-M M-2** peristaltic metering injector pump from **Blue-White Industries** meets the requirements for both the chlorine and ammonia pumps in a chloramine application. It includes an easy-to-use intelligent control systems design, which permits connection to SCADA systems and other remote controllers, for chemical dosing control via either a 4-20mA signal, a high-speed digital pulse input, or a slow pulse for batching type applications. The head roller assembly has two CNC-machined squeeze rollers and two alignment rollers. The firmware is field upgradable. Output is from .007 to 15 gph with output pressure ratings to 125 psi. It is certified NEMA 4X, IP66, NSF STD 61, CE, and ETL.

714/893-8529; [www.blue-white.com](http://www.blue-white.com); Booth #341



## Force Flow TOTE BIN SCALE

The **TOTE BIN SCALE** from **Force Flow** allows plant operators to accurately monitor the amount of polymer being fed from IBC-type totes for dewatering. Simply place the tote on the platform and monitoring begins, as there is nothing to install inside the tote. Systems prevent costly overfeed conditions, and enable the documentation of the actual amount fed. It can be remotely monitored from SCADA or PLC. It is available with the SOLO G2 digital display or with the advanced Wizard 4000 Chemical Inventory Monitoring System. Polymer day tank and drum scales are also available.

800/893-6723; [www.forceflow.com](http://www.forceflow.com); Booth #1440



## Hach QbD1200

The **Hach QbD1200** takes the pain out of TOC analysis and lowers total cost of ownership. This laboratory TOC analyzer produces consistent results, with less carryover. Analysis is simple and straightforward, with 90-percent fewer measurement setup steps and only 90 minutes to calibrate. A single reagent and innovative design ensure that maintenance is infrequent and easy.

800/227-4224; [www.hach.com](http://www.hach.com); Booth #701



## Keller LevelRat

The **Keller LevelRat** proves that wastewater level transmitters don't need to be bulky, that non-stick diaphragms don't need to be large and fragile, lead times can be short, and guaranteed lightning protection is a right. The LevelRat offers 0.5 percent FS TEB accuracy, which is double the original specification. It also is offered with dual outputs, one analog and one RS485 digital. Models equipped with a 4-20mA analog output include guaranteed lightning protection. This feature is included at no additional cost and carries a lifetime guarantee against damage from electrical surge.

877/253-5537; [www.kelleramerica.com](http://www.kelleramerica.com); Booth #400



## ACE16 PRODUCT PREVIEW

### Tank Connection Bolted RTP Tank

The **Bolted RTP Tank** design from **Tank Connection** is unmatched in performance for liquid storage. Bolted RTP tanks have exact manufacturing tolerances and a LIQ Fusion 7000 FBE powder-coat process available for bolted tank construction. The company designs, manufactures and installs aluminum geodesic domes for liquid storage tank applications. The dome covers are all aluminum, maintenance free, corrosion resistant and provide superior field performance.



620/423-3010; [www.tankconnection.com](http://www.tankconnection.com); Booth #757

### Thompson Pipe Group Flowtite FRP

**Flowtite FRP** from **Thompson Pipe Group** is rapidly becoming the pipe of choice for gravity, force main and pressure applications. Specified for open-cut, slipline and jacking applications, this tough, corrosion-resistant product is manufactured using the continuous-winding method. This gives outstanding strength and allows for a range of pressure and stiffness classes, as well as different dimensions and lengths. It comes with easy-to-assemble couplings with REKA gaskets. The result is a product that boasts a life expectancy of 150 years. It helps save time and money from day one and throughout the life of the product.



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2. The hydraulic control valves are placed at strategic locations around the distribution system.



# Smart Control of Flow and Pressure

IVL FLOW CONTROL SOLUTIONS AIM TO HELP WATER UTILITIES BUILD AUTONOMOUS DISTRIBUTION SYSTEMS THAT ENSURE RELIABLE SUPPLY AND LIMIT LOSSES TO LEAKAGE

By Ted J. Rulseh

**F**low and pressure control is one of the biggest challenges in operating a water distribution system. Inadequate pressure means substandard service and possibly compromised firefighting capability. Excessive pressure, on the other hand, can accelerate leakage and cause pipe bursts.

The key to an efficient distribution system is balancing flow and pressure throughout the system. IVL Flow Control, a unit of Ham Baker Adams Group, offers an innovative approach based on strategic deployment of hydraulic control valves and air valves.

The company helps utilities create autonomous smart networks that provide a reliable water supply and high-quality customer service at minimal cost. Such a system does not require telemetry control, although linking to telemetry can enable more advanced network control. The flow and pressure management solution can be combined with active leak detection to help reduce water losses. Craig Stanners, IVL Flow Control director, talked about the offering in an interview with *Treatment Plant Operator*.

**tpo:** What is the basic concept behind IVL Flow Control?

**Stanners:** We understand water networks and how they are designed, from the source to the end user and everything in between. We work from knowledge of the network's hydraulics to develop a system of smart valves that can be set up to work on their own, or can be adapted to work with modern-day communications.

**tpo:** What experience does your company have in deploying this solution?

**Stanners:** We've worked with water companies in the U.K., including that country's oldest, Thames Water. We've also worked elsewhere in Europe with smaller municipalities. We have helped African countries that are implementing new water systems or connecting villages that have never had water service. And we have worked on larger systems in the Middle East such as Qatar, Dubai and Abu Dhabi that are planning very fast infrastructure changes.

**tpo:** In the largest sense, what does your solution do for water utilities?

**Stanners:** Basically, it deals with pressure management, leak reduction and transient issues like water hammer. If, for example, the system includes aging pipes nearing end of life, our solution will provide longevity by eliminating sharp bursts of pressure in the system. It creates a smooth flow all the way from the treatment works or reservoir to the end client. By balancing the system we can also reduce the electrical cost to operate it.

**tpo:** Please describe the equipment you deploy in the field to implement this solution.

**Stanners:** We deploy a range of hydraulic control valves, including demand control valves as well as pressure-reducing valves, altitude valves, and in general all the types of valves commonly used in water systems. The advantage of our valves is that they operate from zero flow. That means the

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valves don't become unstable when the pressure drops to a bare minimum. We also have an extensive range of air valves that are built to deal with transient issues, such as rapid pressure surges. So if a utility needs to charge a main very quickly, these valves will allow that to happen without causing bursts in the system.

**tpo:** What is unique about the valves you deploy?

**Stanners:** Our control valves are pilot-driven valves. As water pulses through the valve, there is fine control by way of the seat coming from the top cover down to the bottom sealing surface. Our valves provide a positive seat-

“ We tend to think that innovation is software, but software is only as good as the network itself. If a water network is failing because of its design and the materials in it, the best software in the world won't be able to help that system.”

**CRAIG STANNERS**

ing closure, which provides the ultimate flow control. They also have a large belly that allows very high volumes to flow through. The openings range from as small as 1 inch up to 52 inches. The valves are manufactured of ductile iron graded to at least 25 bar pressure. They have stainless steel internal and external components. The sealing parts of the valve are EPDM rubber.

**tpo:** How are all these valves controlled, connected, monitored, operated?

**Stanners:** We try to establish an autonomous system, where the valves automatically notice and adjust to changes in pressure in the system. Demand control valves are intelligent valves that use the pipeline network itself as the medium to transfer information. Each valve senses whether water is available upstream and whether water is required downstream. If both conditions

are met, the valve will operate and deliver water. It's purely a hydraulic transfer. But if a client wants the capability to override and force those valves to do different things at different times of day or night depending on what is happening at given points in the network, we have adaptations that allow for PLC, telemetry and SCADA-driven control technology.

**tpo:** What is the first step in deploying this solution?

**Stanners:** We start by asking the water company what they want to achieve in the problematic areas of their network — and every utility has such areas. What are they experiencing? Are they having high burst rates because they're modulating or because of the way the system is being run? We find out about the historical problems in the network and gather general information: What are the pipe materials? How old are the pipes? What are the flows and pressures? If need be, we can send in a team to conduct a full system survey.

**tpo:** Once basic data is in hand, what is the next step?

**Stanners:** We construct a hydraulic design model that enables us to predict what savings the client can expect if we deploy our system within their network. They can then decide whether to make an investment to achieve the savings that would continue for 30 years or more.

**tpo:** These significant savings can be achieved solely with valve technology and without extensive computerization?

**Stanners:** We tend to think that innovation is software, but software is only as good as the network itself. If a water network is failing because of its design and the materials in it, the best software in the world won't be able to help that system. You'll still have leaks, you'll still have bursts and you'll still have low-pressure and high-pressure situations. If you have a perfect network, yes, that can benefit from software. At the end of the day, what you need is accurate control of the water that's passing through the system. **tpo**

# tpo 2016

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info@amtechtanklining.com  
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phaizman@amwell-inc.com  
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**Analytical Technology, Inc.**  
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800-959-0299 • 610-917-0991 • Fax: 610-917-0992  
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www.analyticaltechnology.com  
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760-727-2683  
info@anuewater.com  
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**Aqua Operations, Inc.**  
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childerbrand@aquaooperations.com  
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steve@ausllc.com  
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solutions@aquaaerobic.com  
www.aquaaerobic.com  
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979-245-5656 • Fax: 979-245-8070  
zymme@aquazyme.com  
www.aquazyme.com  
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ats@aquaturbo.com  
www.aquaturbousa.com

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tphillips@bcrenv.com  
www.bcrenv.com

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www.binmaster.com  
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cwest@bioairsolutions.com  
www.bioairsolutions.com

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www.bionetix-international.com  
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www.camspray.com  
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www.caryloncorp.com  
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www.cem.com

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www.strikeproducts.com  
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www.centrisys.com  
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sales@chemetrics.com  
www.chemetrics.com  
**Ad on page 27**

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www.chromalox.com

**CleanTek Water Solutions**  
7984 University Ave.  
Fridley, MN 55432  
866-929-7773  
info@cleantekwater.com  
www.cleantekwater.com

**ClearSpan Fabric Structures**  
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South Windsor, CT 06074  
866-643-1010  
trussinquiry@clearspan.com  
www.clearspan.com  
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**CNP - Technology Water and Biosolids Corp.**  
9535 58th Pl.  
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262-764-3651 • Fax: 262-764-8705  
gerhard.forstner@cnp-tec.com  
www.cnp-tec.com  
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937-778-8947 • Fax: 937-778-5969  
jeverman@cranepumps.com  
www.cranepumps.com

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913-621-3700  
www.cstindustries.com  
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## D

**Deep Trekker Inc.**  
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Ayr, ON N0B 1E0  
Canada  
519-342-3177  
sales@deeptrekker.com  
www.deeptrekker.com  
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sales@pumpsebara.com  
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www.enviro-care.com  
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info@environeticsinc.com  
www.environeticsinc.com

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info@sewershield.com  
www.sewershield.com

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www.environmentaldynamics.com

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**F**



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www.flomatic.com

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sales@flotweg.net  
www.flotweg.com

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www.forceflow.com  
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**Ford Hall Company, Inc.**  
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sperry@fordhall.com  
www.weir-wolf.com  
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**Fournier Industries, Inc.**  
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418-423-6912 • Fax: 418-423-7366  
s.fournier@fournierindustries.com  
www.rotary-press.com  
**Ad on page 95**

**G**

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www.gardnerdenverproducts.com  
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**Garland Manufacturing Company**  
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wastewater@garlandmfg.com  
www.garlandmfg.com/plastics/wastewater.html  
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www.gea.com

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Three Lakes, WI 54562  
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sales@generator-parts.com  
www.generator-parts.com  
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**Geomembrane Technologies Inc.**  
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Fredericton, NB E3B 6E9  
Canada  
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covers@gticcovers.com  
www.gticcovers.com

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brentgill@gilltrading.com  
www.gilltrading.com

**GKD-USA, Inc.**  
825 Chesapeake Dr.  
Cambridge, MD 21613  
800-453-8616 • 410-221-0542 • Fax: 410-221-0544  
sales@gkdusa.com  
www.gkdusa.com



**Glasdon, Inc.**  
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inquiries@glasdon.com  
www.glasdon.com

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grsales@gormanrupp.com  
www.GRpumps.com  
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sales@graceindustries.com  
www.graceloneworker.com

**H**

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orders@hach.com  
www.hach.com  
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Irvine, CA 92614  
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info@halogenvalve.com  
www.halogenvalve.com

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sales@harwil.com  
www.harwil.com



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customer.service@hawkinsinc.com  
www.hawkinsinc.com

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www.haywardflowcontrol.com  
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marketing@hhusa.net  
www.huberforum.net  
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www.hydrite.com

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866-615-8130 • Fax: 503-615-2906  
wwinquiry@hydro-int.com  
www.hydro-int.com

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Hamilton, ON L8P 4R5  
Canada  
905-522-0012 • Fax: 905-522-0031  
info@hydromantis.com  
www.hydromantis.com

I

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888-325-5033 • Fax: 630-509-2490  
jwilliams@in-pipe.com  
www.in-pipe.com

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anderson@ieccovers.com  
www.ieccovers.com

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1 Life Way  
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412-788-4353 • Fax: 412-788-8353  
info@indsci.com  
www.indsci.com

**Industrial Test Systems, Inc.**  
1875 Langston St.  
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800-861-9712 • 803-329-9712  
its@sensafe.com  
www.sensafe.com

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mkt@ipcol.com  
www.ipcol.com



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info@iwaki-america.com  
www.iwaki-america.com

J



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infous@jacobi.net  
www.jacobi.net

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973-366-6556 • Fax: 973-366-3193  
sales@jdvequipment.com  
www.jdvequipment.com

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Mesa, AZ 85215  
480-986-1212 • Fax: 480-380-4461  
info@jpciservices.com  
www.jpciservices.com

K

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khankinson@kchservices.com  
www.kchservices.com

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Buffalo, NY 14206  
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info@keesafety.com  
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351 Bell King Rd.  
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4321 W 6th St.  
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water@kemira.com  
www.kemira.com

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www.komline.com  
**Ad on page 45**

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info@krohne.com  
us.krohne.com  
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sales@ksbusa.com  
www.ksbusa.com

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chris.searles@kuhn.com  
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**L**



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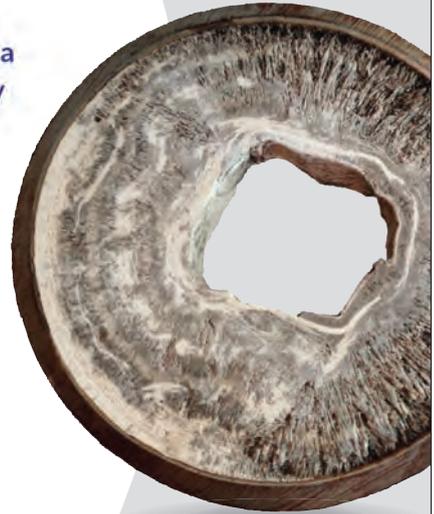


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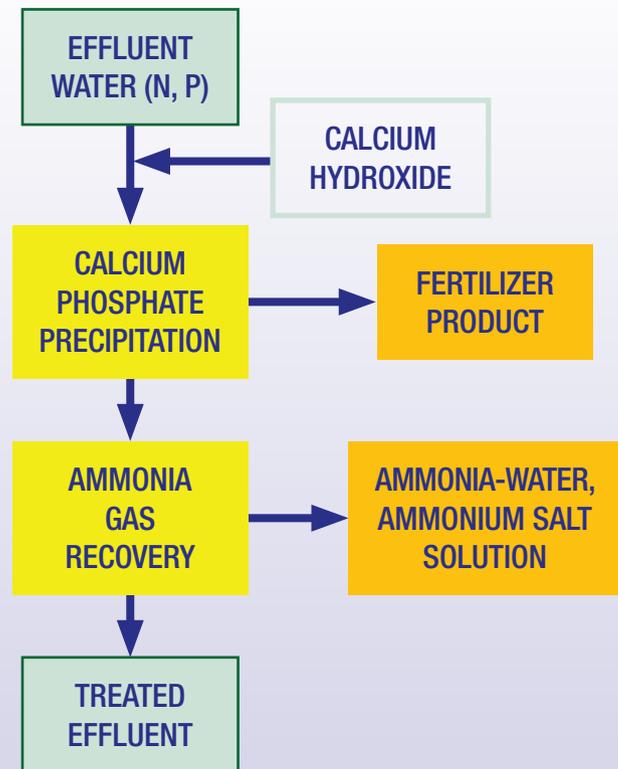


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gerhard.forstner@cnp-tec.com  
www.cnp-tec.com  
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**Flottweg Separation Technology, Inc.**

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sales@flottweg.net  
www.flottweg.com

**Heron Innovators**

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**Ovivo USA, LLC**

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info.us@ovivowater.com  
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info@sierrainstruments.com  
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solutions@aqua-aerobic.com  
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info@psiroatary.com  
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**Glasdon, Inc.**  
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855-874-5273 • 804-726-3777 • Fax: 804-726-3778  
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www.halogenvulve.com

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public-works@soneticscorp.com  
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www.aquazyme.com  
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**CleanTek Water Solutions**  
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www.cleantekwater.com

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### Enviro-Care Company

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www.huberforum.net  
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### JDV Equipment Corporation

Dover, NJ  
973-366-6556 • Fax: 973-366-3193  
sales@jdvequipment.com  
www.jdvequipment.com  
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### Lakeside Equipment Corporation

Bartlett, IL  
630-837-5640 • Fax: 630-837-5647  
sales@lakeside-equipment.com  
www.lakeside-equipment.com  
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### Screenco Systems LLC

Genesee, ID  
208-790-8770  
sales@screencosystems.com  
www.screencosystems.com  
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### Vaughan Company, Inc.

Montesano, WA  
888-249-2467 • 360-249-4042 • Fax: 360-249-6155  
info@chopperpumps.com  
www.chopperpumps.com  
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### Vulcan Industries, Inc.

Missouri Valley, IA  
712-642-2755 • Fax: 712-642-4256  
norm@vulcanindustries.com  
www.vulcanindustries.com  
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## Sequencing Batch Reactors (SBR)

### Aeration Industries International

Chaska, MN  
800-328-8287 • 952-448-6789 • Fax: 952-448-7293  
triton@aireo2.com  
www.aireo2.com

### Alfa Laval Ashbrook Simon-Hartley

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

### Aqua Operations, Inc.

Bakersfield, CA  
888-746-6535 • 661-331-1181 • Fax: 661-833-1861  
childerbrand@aquaoptions.com  
www.aquaoptions.com



### Aqua-Aerobic Systems, Inc.

Loves Park, IL  
800-940-5008 • 815-654-2501 • Fax: 815-654-2508  
solutions@aquaaerobic.com  
www.aquaaerobic.com  
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### Enterprise Specialty Products

Laurens, SC  
864-984-7700 • Fax: 864-984-2241  
www.enterprisesp.com

### Environmental Dynamics International

Columbia, MO  
573-474-9456  
www.environmentaldynamics.com



**Evoqua Water Technologies LLC**  
Warrendale, PA  
www.evoqua.com

**F & V Operations and Resource Management**  
Grand Rapids, MI  
888-773-8806 • 616-588-2900 • Fax: 616-977-1005  
bselover@fv-operations.com  
www.fv-operations.com



Cleaner Water for a Brighter Future!

**Lakeside Equipment Corporation**

Bartlett, IL  
630-837-5640 • Fax: 630-837-5647  
sales@lakeside-equipment.com  
www.lakeside-equipment.com

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**Ovivo USA, LLC**

Austin, TX  
512-834-6000 • Fax: 512-834-6039  
info.us@ovivowater.com  
www.ovivowater.com

**Parkson**

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

**Premier Tech Aqua**

Riviere-du-Loup, QC  
Canada  
800-632-6356 • 418-867-8883 • Fax: 418-862-6642  
pta@premiertech.com  
www.premiertechaqua.com



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Brown Deer, WI  
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www.sanitaire.com

**Service Company**

**Activated Carbon Services - PACS**

Coraopolis, PA  
800-334-0459 • 724-457-6576  
henry@pacslabs.com  
www.pacslabs.com

**Carylon Corporation**

Chicago, IL  
800-621-4342 • 312-666-7700 • Fax: 312-666-5810  
info@caryloncorp.com  
www.caryloncorp.com

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**F & V Operations and Resource Management**

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

**JPCI Services**

Mesa, AZ  
480-986-1212 • Fax: 480-380-4461  
info@jpciservices.com  
www.jpciservices.com

**Polston Applied Technologies**

Sarasota, FL  
844-765-7866 • 941-444-1440 • Fax: 941-219-3080  
rsmith@polstonprocess.com  
www.polstonprocess.com

**Sight Flow Indicators**

**Sure Flow Products, LLC**

Wixom, MI  
248-380-3569 • Fax: 248-380-3568  
sales@sureflowproducts.com  
www.flowmetersource.com

**Skimmers**

**AMWELL, A Div. of McNish Corp.**

Aurora, IL  
630-898-6900 • Fax: 630-898-1647  
phaizman@amwell-inc.com  
www.amwell-inc.com

**E & I Corporation, a Div. of McNish Corporation**

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

**Sludge - Collectors/  
Measurement**

**AMWELL, A Div. of McNish Corp.**

Aurora, IL  
630-898-6900 • Fax: 630-898-1647  
phaizman@amwell-inc.com  
www.amwell-inc.com

**E & I Corporation, a Div. of McNish Corporation**

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

**Garland Manufacturing Company**

Saco, ME  
800-727-1900 • 207-283-3693 • Fax: 207-283-4834  
wastewater@garlandmfg.com  
www.garlandmfg.com/plastics/wastewater.html

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**Nasco Whirl-Pak**

Fort Atkinson, WI  
800-558-9595 • 920-568-5578 • Fax: 920-568-5778  
info@enasco.com  
www.enasco.com/whirlpak

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**YSI, a Xylem brand**

Yellow Springs, OH  
800-765-4974 • 937-767-7241 • Fax: 937-767-9353  
info@ysi.com  
www.ysi.com

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**Sludge - Dewatering/Presses**

**Alfa Laval Ashbrook Simon-Hartley**

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

**AQUA-Zyme Disposal Systems, Inc.**

Van Vleck, TX  
979-245-5656 • Fax: 979-245-8070  
zymme@aqua-zyme.com  
www.aqua-zyme.com

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**BCR Environmental Corporation**

Jacksonville, FL  
904-819-9170 • Fax: 904-998-3828  
tphillips@bcrenv.com  
www.bcrenv.com

**BDP Industries**

Greenwich, NY  
518-695-6851  
dan@bdpindustries.com  
www.bdpindustries.com

**Boerger, LLC**

Chanhassen, MN  
612-435-7300 • Fax: 612-435-7301  
america@boerger.com  
www.boerger.com

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**Centrisys Corporation**

Kenosha, WI  
877-339-5496 • 262-654-6006 • Fax: 262-764-8705  
info@centrisys.us  
www.centrisys.com

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**Dolphin Centrifuge**

Warren, MI  
248-522-2573  
sales@dolphincentrifuge.com  
www.dolphincentrifuge.com

**FKC Co., Ltd.**

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

**Flottweg Separation Technology, Inc.**

Independence, KY  
859-448-2331 • Fax: 859-448-2333  
sales@flottweg.net  
www.flottweg.com



**Fournier Industries, Inc.**

Theftord Mines, QC  
Canada  
418-423-6912 • Fax: 418-423-7366  
s.fournier@fournierindustries.com  
www.rotary-press.com

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**Garland Manufacturing Company**

Saco, ME  
800-727-1900 • 207-283-3693 • Fax: 207-283-4834  
wastewater@garlandmfg.com  
www.garlandmfg.com/plastics/wastewater.html

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**GEA Group**

Northvale, NJ  
800-722-6622 • 201-767-3900 • Fax: 201-767-3901  
info.wsus@gea.com  
www.gea.com

**GKD-USA, Inc.**

Cambridge, MD  
800-453-8616 • 410-221-0542 • Fax: 410-221-0544  
sales@gkdusa.com  
www.gkdusa.com

**Heron Innovators**

Rocklin, CA  
916-408-6601 • Fax: 916-408-6991  
info@heroninnovators.com  
www.heroninnovators.com



**Huber Technology, Inc.**

Huntersville, NC  
704-949-1010 • Fax: 704-949-1020  
marketing@hhusa.net  
www.huberforum.net

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**Hydro International**

Hillsboro, OR  
866-615-8130 • 503-615-8130 • Fax: 503-615-2906  
wwinquiry@hydro-int.com  
www.hydro-int.com

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**JDV Equipment Corporation**

Dover, NJ  
973-366-6556 • Fax: 973-366-3193  
sales@jdvequipment.com  
www.jdvequipment.com

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**Komline-Sanderson**

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

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**Ovivo USA, LLC**

Austin, TX  
512-834-6000 • Fax: 512-834-6039  
info.us@ovivowater.com  
www.ovivowater.com



**Press Technology & Mfg., Inc.**

Springfield, OH  
937-327-0755 • Fax: 937-327-0756  
dberner@presstechnology.com  
www.presstechnology.com

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**Prime Solution, Inc.**

Otsego, MI  
269-694-6666 • Fax: 616-516-1451  
info@psiroatary.com  
www.psirotary.com

**Schwing Bioset, Inc.**

Somerset, WI  
844-246-7381 • 715-247-3433 • Fax: 715-247-3438  
marketing@schwingbioset.com  
www.schwingbioset.com



**SUEZ**  
Richmond, VA  
800-446-1150 • 804-756-7600  
info-infilco@degtec.com  
www.degremont-technologies.com

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**Vertiflo Pump Company**  
Cincinnati, OH  
513-530-0888 • Fax: 513-530-0893  
sales@vertiflopump.com  
www.vertiflopump.com



**VFOLD INC.**  
London, ON  
Canada  
877-818-3653 • Fax: 519-659-6941  
sales@vfoldinc.com  
www.vfoldinc.com

**Wastewater Depot, LLC**  
Batavia, OH  
513-732-0129 • Fax: 513-735-1485  
www.wastewaterdepot.com

**Weir Specialty Pumps (WEMCO)**  
Salt Lake City, UT  
801-359-8731 • Fax: 801-530-7828  
wsprfq@weirgroup.com  
www.weirpowerindustrial.com

## Sludge - Dryers

**BCR Environmental Corporation**  
Jacksonville, FL  
904-819-9170 • Fax: 904-998-3828  
tphillips@bcrenv.com  
www.bcrenv.com

**BDP Industries**  
Greenwich, NY  
518-695-6851  
dan@bdpindustries.com  
www.bdpindustries.com

**GKD-USA, Inc.**  
Cambridge, MD  
800-453-8616 • 410-221-0542 • Fax: 410-221-0544  
sales@gkdusa.com  
www.gkdusa.com

**Huber Technology, Inc.**  
Huntersville, NC  
704-949-1010 • Fax: 704-949-1020  
marketing@hhusa.net  
www.huberforum.net  
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**Komline-Sanderson**  
Peapack, NJ  
800-225-5457 • 908-234-1000 • Fax: 908-234-9487  
info@komline.com  
www.komline.com  
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**Schwing Bioset, Inc.**  
Somerset, WI  
844-246-7381 • 715-247-3433 • Fax: 715-247-3438  
marketing@schwingbioset.com  
www.schwingbioset.com



**SUEZ**  
Richmond, VA  
800-446-1150 • 804-756-7600  
info-infilco@degtec.com  
www.degremont-technologies.com

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## Sludge - Hauling/Disposal

**BCR Environmental Corporation**  
Jacksonville, FL  
904-819-9170 • Fax: 904-998-3828  
tphillips@bcrenv.com  
www.bcrenv.com

**Carylon Corporation**  
Chicago, IL  
800-621-4342 • 312-666-7700 • Fax: 312-666-5810  
info@caryloncorp.com  
www.caryloncorp.com

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**Kuhn North America, Inc.**  
Brodhead, WI  
608-897-2131 • Fax: 608-897-2561  
chris.searles@kuhn.com  
www.kuhnnorthamerica.com

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**Lystek International Inc.**  
Cambridge, ON  
Canada  
888-501-6508 • 226-444-0186 • Fax: 888-501-7429  
kevinl@lystek.com  
www.lystek.com

**Schwing Bioset, Inc.**  
Somerset, WI  
844-246-7381 • 715-247-3433 • Fax: 715-247-3438  
marketing@schwingbioset.com  
www.schwingbioset.com

## Sludge - Heaters

**CleanTek Water Solutions**  
Fridley, MN  
866-929-7773  
info@cleantekwater.com  
www.cleantekwater.com

**HRS HEAT EXCHANGERS**  
Phoenix, AZ  
623-915-4328  
info@hrs-heatexchangers.com  
www.hrs-heatexchangers.com

**JDV Equipment Corporation**  
Dover, NJ  
973-366-6556 • Fax: 973-366-3193  
sales@jdvequipment.com  
www.jdvequipment.com  
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## Sludge - Mixers/Thickeners

**Alfa Laval Ashbrook Simon-Hartley**  
Richmond, VA  
866-253-2528  
customerservice.usa@alfalaval.com  
www.alfalaval.us

**AMWELL, A Div. of McNish Corp.**  
Aurora, IL  
630-898-6900 • Fax: 630-898-1647  
phaizman@amwell-inc.com  
www.amwell-inc.com

**AQUATURBO SYSTEMS, Inc.**  
Springdale, AR  
479-927-1300 • Fax: 479-927-0700  
ats@aquaturbo.com  
www.aquaturbousa.com

**BCR Environmental Corporation**  
Jacksonville, FL  
904-819-9170 • Fax: 904-998-3828  
tphillips@bcrenv.com  
www.bcrenv.com

**BDP Industries**  
Greenwich, NY  
518-695-6851  
dan@bdpindustries.com  
www.bdpindustries.com



**Centrisys Corporation**  
Kenosha, WI  
877-339-5496 • 262-654-6006 • Fax: 262-764-8705  
info@centrisys.us  
www.centrisys.com

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**CleanTek Water Solutions**  
Fridley, MN  
866-929-7773  
info@cleantekwater.com  
www.cleantekwater.com

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



a xylem brand

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Charlotte, NC  
855-995-4261 • Fax: 704-295-9080  
www.flygtus.com  
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**Huber Technology, Inc.**  
Huntersville, NC  
704-949-1010 • Fax: 704-949-1020  
marketing@hhusa.net  
www.huberforum.net  
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**JDV Equipment Corporation**  
Dover, NJ  
973-366-6556 • Fax: 973-366-3193  
sales@jdvequipment.com  
www.jdvequipment.com  
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**Komline-Sanderson**  
Peapack, NJ  
800-225-5457 • 908-234-1000 • Fax: 908-234-9487  
info@komline.com  
www.komline.com

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**KSB, Inc.**  
Henrico, VA  
800-945-7867 • 804-222-1818 • Fax: 804-226-6961  
sales@ksbusa.com  
www.ksbusa.com

**Kuhn North America, Inc.**  
Brodhead, WI  
608-897-2131 • Fax: 608-897-2561  
chris.searles@kuhn.com  
www.kuhnnorthamerica.com

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**Ovivo USA, LLC**  
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512-834-6000 • Fax: 512-834-6039  
info.us@ovivowater.com  
www.ovivowater.com

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

**Pulsed Hydraulics, Inc.**  
Oroville, WA  
800-641-1726 • 425-785-3225  
info@phiwater.com  
www.phiwater.com  
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**Vaughan Company, Inc.**  
Montesano, WA  
888-249-2467 • 360-249-4042 • Fax: 360-249-6155  
info@chopperpumps.com  
www.chopperpumps.com  
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**Vulcan Industries, Inc.**  
Missouri Valley, IA  
712-642-2755 • Fax: 712-642-4256  
norm@vulcanindustries.com  
www.vulcanindustries.com  
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**Walker Process Equipment, A Div. of McNish Corp.**  
Aurora, IL  
800-992-5537 • 630-892-7921 • Fax: 630-892-7951  
walker.process@walker-process.com  
www.walker-process.com  
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## Sludge - Screening

**Enviro-Care Company**  
Gurnee, IL  
815-636-8306 • Fax: 847-672-7968  
ecsales@enviro-care.com  
www.enviro-care.com  
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## Sludge Reduction/Treatment

**BCR Environmental Corporation**  
Jacksonville, FL  
904-819-9170 • Fax: 904-998-3828  
tphillips@bcrenv.com  
www.bcrenv.com

**Bionetix International**  
Ste-Anne-de-Bellevue, QC  
Canada  
514-457-2914 • Fax: 514-457-3589  
ddmarco@bionetix.ca  
www.bionetix-international.com  
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**Bradley Innovation Group**  
Indianapolis, IN  
317-726-6615  
sales@big-h2o.com  
www.big-h2o.com

**Carylon Corporation**  
Chicago, IL  
800-621-4342 • 312-666-7700 • Fax: 312-666-5810  
info@caryloncorp.com  
www.caryloncorp.com  
**Ad on page 39**



**CNP - Technology Water and Biosolids Corp.**  
Kenosha, WI  
262-764-3651 • Fax: 262-764-8705  
gerhard.forstner@cnptec.com  
www.cnptec.com  
**Ad on page 69**

**Flottweg Separation Technology, Inc.**  
Independence, KY  
859-448-2331 • Fax: 859-448-2333  
sales@flottweg.net  
www.flottweg.com

**Huber Technology, Inc.**  
Huntersville, NC  
704-949-1010 • Fax: 704-949-1020  
marketing@hhusa.net  
www.huberforum.net  
**Ad on page 9**

**Kemira**  
Lawrence, KS  
800-879-6353 • 785-842-7424 • Fax: 785-842-2629  
water@kemira.com  
www.kemira.com

**Lystek International Inc.**  
Cambridge, ON  
Canada  
888-501-6508 • 226-444-0186 • Fax: 888-501-7429  
kevinl@lystek.com  
www.lystek.com

**Ovivo USA, LLC**  
Austin, TX  
512-834-6000 • Fax: 512-834-6039  
info.us@ovivowater.com  
www.ovivowater.com

**Praxair, Inc.**  
Burr Ridge, IL  
800-772-9247 • 630-320-4000 • Fax: 630-320-4508  
info@praxair.com  
www.praxair.com/wastewater



**Prime Solution, Inc.**  
Otsego, MI  
269-694-6666 • Fax: 616-516-1451  
info@psiroatary.com  
www.psirotary.com

**Smith & Loveless, Inc.**  
Lenexa, KS  
800-898-9122 • 913-888-5201 • Fax: 913-888-2173  
answers@smithandloveless.com  
www.smithandloveless.com  
**Ad on page 29**

## Software - Operations/Maintenance

**ABZ, Incorporated**  
Chantilly, VA  
800-747-7401 • Fax: 703-631-5282  
mps@abzinc.com  
www.abzinc.com

**AllMax Software, Inc.**  
Kenton, OH  
800-670-1867 • 419-673-8863 • Fax: 419-673-8864  
sales@allmaxsoftware.com  
www.allmaxsoftware.com  
**Ad on page 117**

**BinMaster Level Controls**  
Lincoln, NE  
800-278-4241 • 402-434-9102 • Fax: 402-434-9133  
info@binmaster.com  
www.binmaster.com  
**Ad on page 120**



**Hydromantis Environmental Software Solutions, Inc.**  
Hamilton, ON  
Canada  
905-522-0012 • Fax: 905-522-0031  
info@hydromantis.com  
www.hydromantis.com

**ProComSol, Ltd**  
Lakewood, OH  
877-221-1551 • 216-221-1550 • Fax: 216-221-1554  
sales@procomsol.com  
www.procomsol.com

## Software - Process Control/Regulatory

**ABZ, Incorporated**  
Chantilly, VA  
800-747-7401 • Fax: 703-631-5282  
mps@abzinc.com  
www.abzinc.com

**Activated Carbon Services - PACS**  
Coraopolis, PA  
800-334-0459 • 724-457-6576  
henry@pacslabs.com  
www.pacslabs.com

**AllMax Software, Inc.**  
Kenton, OH  
800-670-1867 • 419-673-8863 • Fax: 419-673-8864  
sales@allmaxsoftware.com  
www.allmaxsoftware.com  
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**Hach Company**  
Loveland, CO  
800-227-4224 • 970-669-3050  
orders@hach.com  
www.hach.com  
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**Hydromantis Environmental Software Solutions, Inc.**  
Hamilton, ON  
Canada  
905-522-0012 • Fax: 905-522-0031  
info@hydromantis.com  
www.hydromantis.com

## Stormwater Monitoring/Treatment

**Aqua-Aerobic Systems, Inc.**  
Loves Park, IL  
800-940-5008 • 815-654-2501 • Fax: 815-654-2508  
solutions@aquaaerobic.com  
www.aquaaerobic.com  
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**CHEMetrics, Inc.**  
Midland, VA  
800-356-3072 • 540-788-9026 • Fax: 540-788-4856  
sales@chemetrics.com  
www.chemetrics.com  
**Ad on page 27**



**Duperon Corporation**  
Saginaw, MI  
800-383-8479 • 989-754-8800 • Fax: 989-754-2175  
info@duperon.com  
www.duperon.com

**Hydro International**  
Hillsboro, OR  
866-615-8130 • 503-615-8130 • Fax: 503-615-2906  
wvinquiry@hydro-int.com  
www.hydro-int.com  
**Ad on page 63**

**IWAKI America**  
Holliston, MA  
508-429-1440  
info@iwaki-america.com  
www.iwaki-america.com

**Keller America Inc.**  
Newport News, VA  
877-253-5537 • 757-596-6680 • Fax: 757-596-6659  
sales@kelleramerica.com  
www.kelleramerica.com  
**Ad on page 31**

**Kemira**  
Lawrence, KS  
800-879-6353 • 785-842-7424 • Fax: 785-842-2629  
water@kemira.com  
www.kemira.com

**PMC Engineering**  
Danbury, CT  
203-792-8686 • Fax: 203-743-2051  
sales@pmc1.com  
www.pmc1.com

**Solvay Chemicals, Inc.**  
Houston, TX  
800-765-8292 • 713-525-6500 • Fax: 713-525-7806  
john.maziuk@solvay.com  
www.solvaychemicals.us

**Spiral Water Technologies, Inc.**  
San Rafael, CA  
844-277-4725 • 415-460-7300  
info@spiralwater.com  
www.spiralwater.com

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info@ysi.com  
www.ysi.com  
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## Struvite Removal/Recovery



**CNP - Technology Water and Biosolids Corp.**  
Kenosha, WI  
262-764-3651 • Fax: 262-764-8705  
gerhard.forstner@cnptec.com  
www.cnptec.com  
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## Switches/Relays

**ElectroSwitch Corporation**  
Weymouth, MA  
781-335-5200  
www.electroswitch.com

**Harwil Corp.**  
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805-988-6800 • Fax: 805-988-6804  
sales@harwil.com  
www.harwil.com

**PRIMEX®**  
Detroit Lakes, MN  
844-477-4639 • 218-847-1317  
info@primexcontrols.com  
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**Ronk Electrical Industries**  
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800-221-7665 • 217-563-8333 • Fax: 217-563-8336  
sales@ronkelectrical.com  
www.ronkelectrical.com

**WEG Electric Corp**  
Duluth, GA  
800-275-4934  
info@weg.net  
www.weg.net

## Tanks - Chemical Storage

### AmTech Tank Lining & Repair

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info@amtechtanklining.com  
www.amtechtanklining.com

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913-621-3700  
www.cstindustries.com

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### Hawkins, Inc.

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customer.service@hawkinsinc.com  
www.hawkinsinc.com

### KCH Engineered Systems

Forest City, NC  
828-245-9836  
khankinson@kchservices.com  
www.kchservices.com

### Lutz-JESCO America Corp.

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

### Tank Connection Affiliate Group

Parsons, KS  
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sales@tankconnection.com  
www.tankconnection.com

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## Tanks - Cleaning/Inspection/Repair



### AmTech Tank Lining & Repair

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Canada  
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### Environmental Coatings LLC

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info@sewershield.com  
www.sewershield.com

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sperry@fordhall.com  
www.weir-wolf.com

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### GillTrading.com, Inc./WeirWasher, ACS

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866-447-2496 • 503-628-0197 • Fax: 503-646-9293  
brentgill@gilltrading.com  
www.gilltrading.com

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### Environmental Coatings LLC

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info@sewershield.com  
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Lakeville, MN  
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anderson@ieccovers.com  
www.ieccovers.com

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ats@aquaturbo.com  
www.aquaturbousa.com

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www.jdvequipment.com

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www.ksbusa.com

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sales@redvalve.com  
www.redvalve.com

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### ATEC Steel, LLC

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713-937-7602 • Fax: 713-937-4254  
brocha@park-usa.com  
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www.premiertechaqua.com

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eflow@fluidcomponents.com  
www.fluidcomponents.com

### Sierra Instruments, Inc.

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sales@chemetrics.com  
www.chemetrics.com

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liquid.csc@emerson.com  
www.rosemountanalytical.com

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info@us.endress.com  
www.us.endress.com

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orders@hach.com  
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info@seametrics.com  
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www.flowmetersource.com

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pta@premiertech.com  
www.premiertechaqua.com

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sales@prominent.us  
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info@uvpure.com  
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www.asahi-america.com

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flomatic@flomatic.com  
www.flomatic.com

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410-636-2250 • Fax: 410-636-9062  
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www.flowrox.us

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www.halogenvulve.com



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hflow@hayward.com  
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800-678-4581 • 440-546-1190 • Fax: 440-546-1188  
danw@rarossne.com  
www.rarossne.com

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**Flomatic Valves**  
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800-833-2040 • 518-761-9797 • Fax: 518-761-9798  
flomatic@flomatic.com  
www.flomatic.com

**Flowrox, Inc.**  
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410-636-2250 • Fax: 410-636-9062  
sales-us@flowrox.com  
www.flowrox.us



**Hayward Flow Control**  
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hflow@hayward.com  
www.haywardflowcontrol.com  
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**Proco Products, Inc.**  
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800-344-3246 • 209-943-6088 • Fax: 209-943-0242  
sales@procoproducts.com  
www.procoproducts.com

**R.A. Ross & Associates NE, Inc.**  
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800-678-4581 • 440-546-1190 • Fax: 440-546-1188  
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www.rarossne.com

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sales@redvalve.com  
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**Zoeller Company**  
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www.sunbeltrentals.com  
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hflow@hayward.com  
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**Asahi/America, Inc.**  
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asahi@asahi-america.com  
www.asahi-america.com

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john.maziuk@solvay.com  
www.solvaychemicals.us

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info@anuewater.com  
www.anuewater.com

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solutions@aqua-aerobic.com  
www.aqua-aerobic.com  
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866-447-2496 • 503-628-0197 • Fax: 503-646-9293  
brentgill@gilltrading.com  
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www.headworksintl.com

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www.smithandloveless.com  
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844-277-4725 • 415-460-7300  
info@spiralwater.com  
www.spiralwater.com



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info-infilco@degtec.com  
www.degremont-technologies.com  
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**UV Pure Technologies, Inc.**  
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888-407-9997 • 416-208-9884 • Fax: 416-208-5808  
info@uvpure.com  
www.uvpure.com

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303-425-4242 • Fax: 303-425-0112  
sales@vafusa.com  
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www.varacorp.com  
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Salt Lake City, UT  
801-265-1000 • Fax: 801-265-1080  
info@westech-inc.com  
www.westech-inc.com

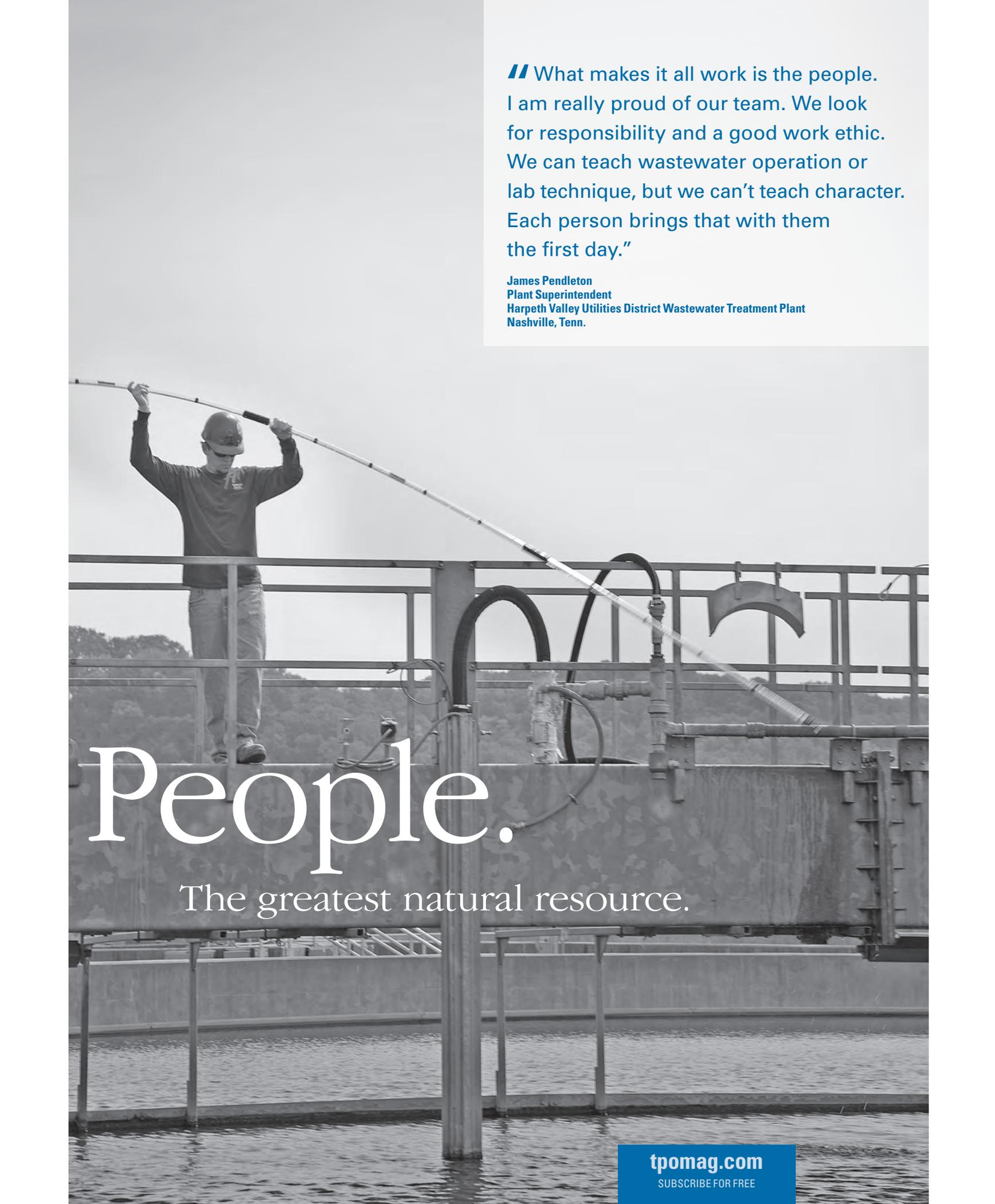
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**Tank Connection Affiliate Group**  
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### 1. VICTAULIC HIGH-PRESSURE SWING CHECK VALVES

The Series 713 line of swing check valves from Victaulic has been extended to include 2- to 4-inch sizes. Designed for headers that feed upstream facilities as well as other high-pressure services, the valve can be used in applications requiring Class 300 pressure ratings. The 2-inch valve is rated to 1,000 psi, while the 2 1/2-, 3- and 4-inch sizes are rated to 750 psi. The valve can be joined to pipe with the Victaulic Original Groove System (OGS) or EndSeal grooved ends. **610/559-3300; www.victaulic.com.**

### 2. ENDRESS+HAUSER RETRACTABLE SENSOR ASSEMBLIES

The Cleanfit CPA871 sensor assembly from Endress+Hauser enables pH, ORP, oxygen and NIR sensors to be installed or removed during operation in water and wastewater treatment plants. By moving the sensor from the measuring position to a service position, the retractable assemblies allow the sensor to be cleaned, calibrated or replaced without interrupting the process. The sensor assembly is available with a manual or automatic drive. **888/363-7377; www.us.endress.com/CPA871.**

### 3. TORREY PINES SCIENTIFIC DIGITAL STIRRING HOT PLATE

The EchoTherm programmable digital stirring hot plate from Torrey Pines Scientific is designed for use in laboratories requiring accurate chemical reaction control and sample preparation. Programming is done through the front panel membrane switch and full-function display. The unit can store 10 programs and up to 10 steps (temperature, temperature ramp rate, stirring speed and time). Each program can be automatically repeated and stored electronically. **866/573-9104; www.torreypinesscientific.com.**

### 4. METALFAB STORAGE BINS AND HOPPER LOADER

The Spin Loader dry solids processing system from Metalfab is available in two carbon steel models (SL100, 8 5/8-inch inlet with 2 hp motor; and SL200, 10 3/4-inch diameter inlet with 5 hp motor). The loading

system eliminates pyramiding that occurs when flakes and granular materials are loaded into bins, hopper cars and piles. It can handle up to 200,000 pounds per hour of 90 pounds per cubic foot material and can be mounted to the top of the bin or attached to a flexible loading spout. **973/764-2000; www.metalfabinc.com.**

### 5. AMETEK DREXELBROOK TANK LEVEL MEASUREMENT SYSTEM

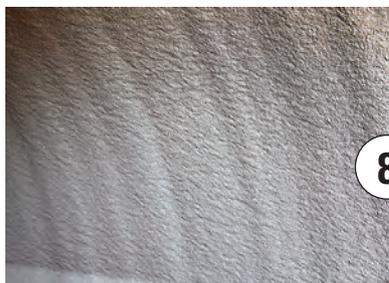
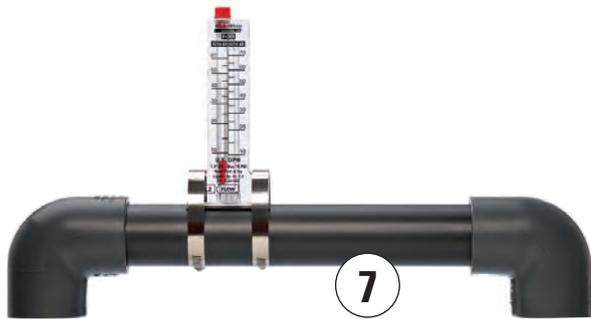
The total tank level measurement system from AMETEK Drexelbrook features five temperature sensor outputs distributed over the length of the polymer and stainless steel probe (available in up to 50-foot lengths and 316 stainless steel). The system's digital Modbus output measures total level, interface level and temperature from an explosion-proof housing. A variety of floats and mounting accessories are available. Probes are offered with a choice of single or dual NPT mountings. **215/674-1234; www.drexelbrook.com.**

### 6. AEGIS DIGITAL OSCILLOSCOPE SHAFT VOLTAGE TESTER

The AEGIS Shaft Voltage Tester digital oscilloscope from Electro Static Technology is designed and configured to take and capture highly accurate voltage measurements from the spinning shafts of motors. A complete package, the CAT II/III digital oscilloscope comes with a conductive micro-fiber probe, probe holder with magnetic base and carrying case. The two-channel, full-function 200 MHz oscilloscope has a 5.7-inch TFT LCD color display, multi-language user interface and five-hour rechargeable/replaceable lithium-ion battery pack. **866/738-1857; www.est-aegis.com.**

### 7. BLUE-WHITE INDUSTRIES SHORT-PIPE-RUN FLOWMETERS

F-300 Series flowmeters from Blue-White Industries feature improved accuracy and require short pipe runs for installation in cramped equip-



ment rooms. Float bounce has also been eliminated. Designed for 1 1/2- and 2-inch pipes, the flowmeters have a high-contrast red float with magnet for use with an alarm flow/no flow accessory. Other features include dual scale (Schedule 40 gpm/Schedule 80 gpm for U.S. PVC models); acceptable for outdoor installations; one-piece, machined acrylic meter body; and annealed for added strength and chemical resistance. 714/893-8529; [www.blue-white.com](http://www.blue-white.com).

## 8. MILLIKEN INFRASTRUCTURE GEOPOLYMER MORTAR SYSTEM

The GeoSpray 60 geopolymer mortar system from Milliken is designed for the rehabilitation and protection of pipe and structures used in potable water systems. The product is NSF/ANSI 61-2014-certified and can be used as a protective mortar lining for corrosion protection or as a structural enhancement in large-diameter pipes and structures. 864/503-2020; [www.milliken.com](http://www.milliken.com).

## 9. WANNER ENGINEERING 1,500 PSI DISCHARGE PUMP

Hydra-Cell D10 Series seal-less pumps from Wanner Engineering have up to 1,500 psi discharge pressure, flow capacity of 4.26 gpm and motor speed of 790 rpm. Spring-loaded, horizontal disk check valves and seal-less design enable the pumps to handle viscous fluids and abrasive particulates up to 500 microns in size. 800/369-4172; [www.hydra-cell.com](http://www.hydra-cell.com).

(continued)

## wastewater: product spotlight

### Aqua-Aerobic filtration optimization system helps meet ultralow phosphorus limits

By Ed Wodalski

The PC-based, stand-alone **IntelliPro Filtration System** from **Aqua-Aerobic Systems** uses real-time data to help wastewater treatment plants meet ultralow phosphorus requirements and optimize chemical usage.

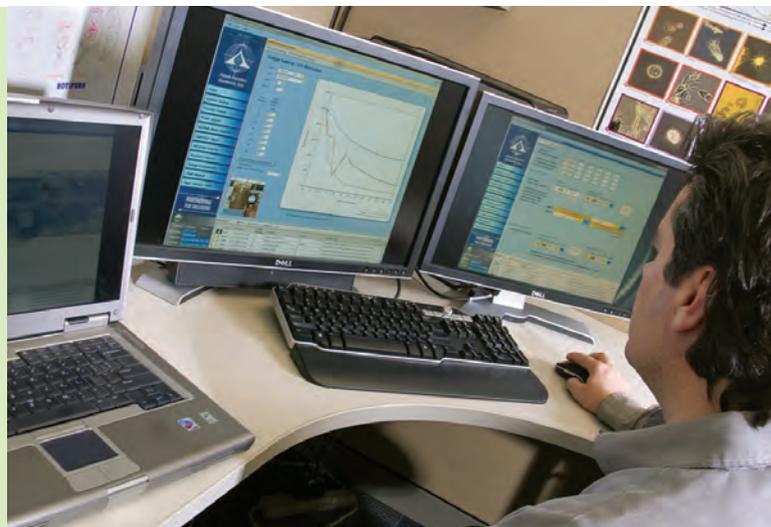
“To put that in perspective, a biological process that uses chemicals can achieve approximately 0.5 mg/L of phosphorus,” says Manuel de los Santos, product manager, biological processes at Aqua-Aerobic Systems. “To achieve lower limits, for example 0.075, a filter or a membrane system is required. The second thing you need is additional chemical. The IntelliPro system includes a unique algorithm coupled with equipment instrumentation to reliably meet the new requirements without wasting chemicals.”

The IntelliPro system can be added to an existing treatment filtration system or be incorporated as part of a new design. Compared to a fixed dosage system, the filtration system can save up to 40 percent in chemical costs and up to 20 percent in a flow-based system.

System applications include nutrient removal optimization, solids management and dissolved oxygen control in municipal and industrial wastewater.

“The key feature is being able to reliably meet the ultralow phosphorus requirements while saving chemicals,” De los Santos says. “It’s mostly for municipal plants because that’s where the requirements are. A lot of the industrial plants don’t have much phosphorus in the wastewater; however, if they do, it would also apply.”

The system can handle any size flows. “It could be 10,000 gallons; it could be 10 million gallons,” he says. “It doesn’t matter. To remove the phosphorus associated with it, you simply remove solids. The more solids



IntelliPro Filtration System from Aqua-Aerobic Systems

you remove, the lower the phosphorus. To aid in the phosphorus removal there are chemicals that need to be added, which is coagulant. What an operator would do is add the coagulant to the system to precipitate the phosphorus. Particles that are formed are removed with a filter.”

Designed for use with Aqua-Aerobic cloth media filters, the system features automatic, optimal-dose selection for metal salts, polymer and pH adjusting chemicals.

“We adjust the chemical dosing to the actual phosphorus mass coming into the system — not only the flow but the actual concentration,” he says. “That way we not only ensure that we are adding the right amount of chemical to the system but also ensure that we are saving chemical. At the same time, the system automatically adjusts the metal-to-phosphorus ratio. If the phosphorus in the effluent starts going up, the system automatically detects that and adjusts the chemical.”

For plants that use polymer, the system can automatically select the correct polymer dosing by performing a series of jar tests to make sure the right amount of polymer is being used. 815/654-2501; [www.aqua-aerobic.com](http://www.aqua-aerobic.com).



**10. FREEWAVE TECHNOLOGIES WIRELESS DATA PLATFORM**

The WavePro WP201 short-haul (1-5 miles) and Wi-Fi hotspot platform from FreeWave Technologies delivers secure collection, control and transport of voice, video, data and sensor (VVDS) information. A critical component of FreeWave's Sensor-2-Server communications solution, the high-speed platform is designed for outdoor industrial locations. Static routing, dynamic routing and multiple VLANs, among other services, allow for streamlined configuration and integration in remote settings where traditional SCADA networks will not suffice. **800/548-5616; www.freewave.com.**

**11. IVC STAINLESS STEEL, HIGH-DEFINITION IP VIDEO CAMERA**

The APTZ-3045-07 high-definition IP video camera from Industrial Video & Control is designed for reliable process, safety and security monitoring in harsh and hazardous environments. The pan-tilt-zoom camera delivers 1080p resolution and low-light performance. Tested and certified Class 1 Division 1, the camera works with IVC's full line of video management software, including the IVC Relay Server and IVC's Longwatch camera management software. The camera also integrates with third-party video security systems or can be operated through a SCADA system. **781/255-7400; www.ivcco.com.**

**12. KUNTZE INSTRUMENTS ASR SELF-CLEANING SENSOR**

The ASR self-cleaning sensor from Kuntze Instruments has the ability to remove organic and inorganic foulants in measurements for free chlorine, chlorine dioxide, ozone and hydrogen peroxide. During the cleaning process, hydrogen and oxygen produced at the electrode surfaces blast away persistent coatings, while oxygen oxidizes organic coatings and hydrogen reduces organic and inorganic substances, especially iron and manganese oxides. Excess gas recombines to water and does not interfere with the measurement or process. **724/339-8510; www.kuntzeinstruments.com.**

**13. BIONOMIC INDUSTRIES ADVANCED TRAY SCRUBBER**

The Series 6000 tray scrubber from Bionomic Industries is available in sizes to handle gas volumes from 500 to 150,000 cfm. Features include high-performance tray designs in single or multiple stages for maximum gas absorption and a once-through water flow pattern for recovery of higher vapor pressure concentrated solutions. **800/311-6767; www.bionomicind.com.**

**14. SENSAPHONE REMOTE MONITORING SYSTEM**

The Sentinel PRO remote monitoring system from Sensaphone supports the Modbus communications protocol (RTU/485 and TCP) and includes a second relay output. The system monitors, delivers alarms and data logs input/output points from third-party Modbus sensors, transducers and programmable logic controllers. Alerts are sent via phone, email or text. Data values can be viewed in real time via sensaphone.net or the Sensaphone iPhone/Android app. **877/373-2700; www.sensaphone.com. tpo**

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

- 1. Victaulic Series 713 line of swing check valves
- 2. Endress+Hauser Cleanfit CPA871 sensor assembly
- 3. Torrey Pines Scientific EchoTherm digital stirring hot plate
- 4. Metalfab Spin Loader dry solids processing system
- 5. AMETEK Drexelbrook total tank level measurement system
- 6. AEGIS Shaft Voltage Tester digital oscilloscope from Electro Static Technology
- 7. Blue-White Industries F-300 Series flowmeters
- 8. Milliken GeoSpray 60 geopolymer mortar system
- 9. Wanner Engineering Hydra-Cell D10 Series seal-less pumps
- 10. FreeWave Technologies WavePro WP201 wireless data platform
- 11. Industrial Video & Control APTZ-3045-07 video camera
- 12. Kuntze Instruments ASR self-cleaning sensor
- 13. Bionomic Industries Series 6000 tray scrubber
- 14. Sensaphone Sentinel PRO remote monitoring system
- Aqua-Aerobic Systems IntelliPro Filtration System
- Badger Meter BEACON advanced metering analytics (AMA) mobile software

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## water: product spotlight



BEACON advanced metering analytics (AMA) mobile software from Badger Meter

### Badger Meter mobile software delivers water data in real time

By Ed Wodalski

BEACON advanced metering analytics (AMA) mobile software from **Badger Meter** automatically synchronizes meter reading field assignments and meter reading data with cloud-based BEACON AMA software whenever an Internet connection is established, saving time and vehicle mileage, while providing water usage data for real-time decision-making.

The map-based software works like a GPS, showing where accounts are located and the movement of the vehicle. As it reads the meters, the icons for the meters change color and indicate if a meter is missed.

“By utilizing a meter reading system like this you can identify the non-revenue water as well by looking at what your production is versus your metered consumption,” says Greg Richards, marketing manager, Badger Meter. “You can look at the consumption by routes or zones.”

Features include ORION meter endpoints that are upgradable from mobile to fixed network data collection without rolling a truck or reprogramming the endpoint. Other features include ISO 27001 and SOC-2 data security platform, automatic software updates and billing, work order, inventory, customer relationship management (CRM) and geographic information systems (GIS) integration.

“A couple key features of the software are a customizable dashboard and drill-down capabilities,” Richards says. “You can look for things like leak alerts on your home screen. You click on that and it’ll give you a list of the accounts.”

The Web-based field director enables dispatchers to update assignments and monitor their completion from the office. Supported Web browsers include Google Chrome (29 or higher), Microsoft Internet Explorer (10 or higher), Apple Safari (5 or higher) and Mozilla Firefox (23 or higher). The Internet connection enables meter readers to get their assignments and transfer reads back to the office using their cell-phones as a hotspot, saving time over manual data transfer.

“Many of the utilities have the water distribution and treatment in one facility,” Richards says. “Having that data available for customer service representatives helps reduce billing adjustments. They can easily see how much water customers consume over a period of time.”  
800/876-3837; [www.badgermeter.com](http://www.badgermeter.com).

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## people/awards

**William M. Davignon** was named supervisor of the North Tonawanda (New York) Wastewater Treatment Plant, replacing **David A. Scott**, who retired. Davignon had worked for more than 28 years as a sanitary chemist in the plant.

**Gerald C. Potamis** retired as wastewater superintendent for the Town of Falmouth, Massachusetts.

**David Kresel** retired as supervisor of the wastewater and stormwater operations for Grand Forks, North Dakota.

The **Welch Public Works Authority** in Craig County received a \$57,868 Rural Economic Action Plan grant through the Oklahoma Water Resources Board to improve the authority's wastewater infrastructure. The authority owns and operates a wastewater collections system that was built in the early 1940s and serves about 600 residents.

The **City of Smithville (Tennessee) Wastewater Treatment Plant** received a \$500,000 Community Development Block Grant to help pay for renovations, in which the headworks and aeration system at the plant will be rehabilitated.

The **Central Clear Creek Sanitation District** received a \$1 million grant from the Colorado Energy/Mineral Impact Assistance Fund to help defray the cost of building a \$3.2 million wastewater facility.

Two staffers at the Warwick (Rhode Island) Sewer Authority were honored for their contributions to wastewater education and management. **BettyAnne Rogers** received the 2015 Water Environment Federation Laboratory Analyst Excellence Award for her work on a School-to-Career Wastewater Analyst/Operator Program and her efforts to ease limits on commercial and industrial discharges. **Patrick Doyle** won the New England Water Environment Association Operator of the Year award. Superintendent **Scott Goodinson** was accepted into the WEF Quarter Century Operator's Club.

**Krebs Engineering** of Birmingham, a consultant for the Municipal Utilities Board of the City of Albertville, won the 2016 Engineering Excellence Awards Competition Grand Award for the Large Project Category from the American Council of Engineering Companies of Alabama.

**Mike Ireland** of Washington Water Service Company of Gig Harbor, Washington, retired after more than 40 years in the industry and 35 years with the company. **Scott Bailey** will succeed him as general manager.

**Lauren Ballenger**, laboratory analyst for Spartanburg Water, was named the 2015 Blue Ridge Foothills District Laboratory Analyst of the Year by the Water Environment Association of South Carolina. **Mike Russell**, lead plant operator, was named the district's 2015 Wastewater Treatment Plant Operator of the Year.

The **Acoma Water and Wastewater Department** received the Max Sumnerlot Award for its North Acoma Wastewater Treatment Facility from the New Mexico Water and Wastewater Association. This award recognizes excellence in operations, maintenance, management, safety and professionalism. The department also received the Water System of the Year award for the Acoma Pueblo Main Public Water System. **Jessie Padilla**, wastewater operator, and **Marc Juare**, water operator, were recognized as Operators of the Year.

## events

### May 1-3

British Columbia Water and Waste Association Annual Conference and Trade Show, The Fairmont Chateau Whistler & Whistler Conference Centre. Visit [www.bcwwa.org](http://www.bcwwa.org).

### May 1-4

Arkansas Water Works and Water Environment Association Annual Conference and Exposition, Embassy Suites Hotel, Hot Springs. Visit [www.awwwea.org](http://www.awwwea.org).

### May 1-4

Water Environment Federation/Georgia Association of Water Professionals Collection Systems 2016, Hyatt Regency, Atlanta. Call 800/462-9420 or visit [www.wef.org](http://www.wef.org).

### May 1-4

Ontario Section AWWA Annual Conference, Caesars Windsor. Visit [www.owwa.ca](http://www.owwa.ca).

### May 2-4

Oklahoma Water Environment Association Spring Technical Conference, Renaissance Hotel and Convention Center, Tulsa. Visit [www.owea.org](http://www.owea.org).

### May 4-6

Pacific Northwest Section AWWA Annual Conference, Boise Centre, Idaho. Visit [www.pnws-awwa.org](http://www.pnws-awwa.org).

### May 10-12

Pennsylvania Section AWWA Annual Conference, Bethlehem Sands Casino and Convention Center. Visit [www.paawwa.org](http://www.paawwa.org).

### May 11-13

Arizona Section AWWA Annual Conference, Renaissance Hotel, Glendale. Visit [www.azwater.org](http://www.azwater.org).

### May 17-19

Western Canada Water Environment Association Biosolids and Residuals Conference, Delta Edmonton Centre, Edmonton, Alberta. Visit [www.wcwea.org](http://www.wcwea.org).

### May 17-20

Central States Water Environment Association Annual Meeting, Monona Terrace, Madison, Wisconsin. Visit [www.cswea.org](http://www.cswea.org).

### May 22-25

West Virginia Section AWWA Annual Conference, Oglebay Resort, Wheeling. Visit [www.wvawwa.org](http://www.wvawwa.org).

### May 25-27

Connecticut Section AWWA Annual Conference, Woodstock, Vermont. Visit [www.ctawwa.org](http://www.ctawwa.org).

*Send your event notices to [editor@tpomag.com](mailto:editor@tpomag.com)*

The **Idaho Falls Wastewater Treatment Plant** Secondary Improvement Project received a first-place award at the 2015 Engineering Excellence Awards Competition through the American Council of Engineering Companies of Idaho.

**Levi Fuller**, wastewater treatment plant operations supervisor for the Dublin San Ramon Services District, was named 2015 Supervisor of the Year by the San Francisco Bay Section of the California Water Environment Association.

**Hach plans 86,000-square-foot expansion**

Hach will break ground this spring on an 86,000-square-foot research and development center on its campus in Loveland, Colorado. The facility will house workspaces for Hach's development teams with multiple testing and development laboratories.

**IWE Istanbul Water Expo Sept. 1-3**

The IWE Istanbul Water Expo, Sept. 1-3 at the Istanbul Expo Center, will feature new technologies for the water and wastewater industries. The 2015 show attracted 3,539 visitors from 59 countries. For more information, visit [www.istanbulwaterexpo.com](http://www.istanbulwaterexpo.com).

**American Water acquires Environmental Disposal, partners with Corona**

American Water acquired Environmental Disposal Corp., provider of wastewater service to 5,300 customers in New Jersey. American Water also partnered with Corona Environmental Consulting to develop WaterSuite, a cloud-based geographic information system software platform. **tpo**



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The American Membrane Technology Association and the AWWA announced the winners of four awards. **Robert Hildreth** of the Colorado River Municipal Water District in Big Spring, Texas, received the Robert O. Vernon Operator of the Year award. The **Orange County Water District** Groundwater Replenishment System in Fountain Valley, California, earned the Membrane Facility of the Year award. **Jim Lozier** of CH2M in Tempe, Arizona, won the Water Quality Person of the Year award. **Ovivo USA** received the Membrane Exhibit of the Year award.

For the third year in a row, the Kentucky Chamber of Commerce and the Kentucky Society for Human Resource Management recognized **Kentucky American Water** as a Best Place to Work in Kentucky.

**Gregg Miller** was appointed water superintendent for the City of Huntingburg, Indiana. He previously served as chief operator at the Huntingburg Water Plant.

**Nathan Brockman** was hired as a water/wastewater operator in Story City, Iowa.

The City of Anderson, Indiana, hired **Neal McKee** as operations director for the water department. He had been operations superintendent for Indiana American Water's Noblesville operations.

TPO welcomes your contributions to this listing. To recognize members of your team, please send notices of new hires, promotions, service milestones, certifications or achievements to [editor@tpomag.com](mailto:editor@tpomag.com). **tpo**



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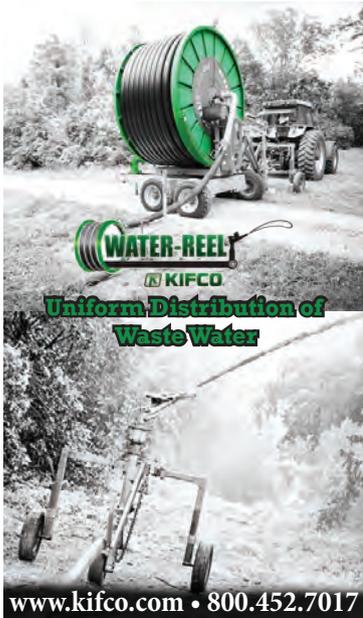
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**POSITIONS AVAILABLE**

The Pinecrest Permittees Association General Manager's Position is open. Located 30 miles above Sonora, CA, in the Stanislaus National Forest. Applicants should have a minimum of 5 years experience in water and wastewater services. Ideally possessing D-2 & T-2, W-2 and be willing to join the volunteer fire department. Salary range DOE \$65,000 to \$75,000. Send resume to PO Box 1248, Pinecrest, CA 95364. E-mail to [ppapatgm@gmail.com](mailto:ppapatgm@gmail.com); phone 209-965-3234 (o05)

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Seeking Lead Tech in Tampa, FL at Surface Water Treatment Plant. View full ad and apply online [tinyurl.com/vna62310](http://tinyurl.com/vna62310). (o05)

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**SAFETY EQUIPMENT**

NEW French Creek, TP7, R50T, MW50G, 7' aluminum fall restraint rescue/retrieval tripod. \$2,000. Call 304-312-3818 (C05)

**SERVICE/REPAIR**

**Dynamic Repairs - Inspection Camera Repairs:** 48 hour turn-around time. General Wire, Ratech, RIDGID, Electric Eel Mfg, Gator Cams, Insight Vision, Vision Intruders. Quality service on all brands. **Rental equipment available.** For more info call Jack at 973-478-0893. Lodi, New Jersey. (CBM)

**WATERBLASTING**

Gardner Denver T-375M: Bare Shaft pump. Gardner Denver T450M Bare Shaft pump. Gardner Denver TF-375M 21 gpm @ 10,000 psi. Gardner Denver TX-450HB 21gpm @ 20,000 PSI. Gardner Denver TF-450MB 52gpm @ 10,000 psi. NLB 10-200. 34 gpm @ 10,000 psi. HT-150S 25 gpm max 10,000 psi max, Shell Side Machine, Wheatley 165: 30 gpm @ 10,000 psi. Wheatley 125 with aluminum bronze fluid end. Boatman Ind. 713-641-6006. View @ [www.boatmanind.com](http://www.boatmanind.com). (CBM)

40,000 psi Sapphire Nozzles, UHP hoses & replacement parts. Excellent quality & prices. 772-286-1218, [info@alljetting.com](mailto:info@alljetting.com), [www.alljetting.com](http://www.alljetting.com). (CBM)

Wisconsin State Fair Park, Milwaukee, Wisconsin

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# Operators EVERYWHERE Trust USABlueBook®

In 2011, Algonquin's Wastewater Treatment Facility was nominated for Class 1 Plant of the Year by IAWPCO (Illinois Association of Water Pollution Control Operators). Criteria for such nominations include exemplary levels of compliance and cleanliness, operator certifications, and ongoing safety programs. Through their hard work and dedication, the team at Algonquin has shown that they're up to the challenge of continued success.

Leading the crew is Chief Wastewater Operator Ed Brown. He works closely with USABlueBook to make sure his team always has the supplies they need to keep their facility up and running. "It's great to know that even when I don't know who to call, I can just call USABlueBook," shared Ed.

**"I ordered parts in the morning,  
and they were here later that afternoon!"**

Whether the team is ordering new chemical feed scales, or miscellaneous items for around the plant, USABlueBook has them covered. "My biggest surprise is always USABlueBook's shipping. I ordered parts in the morning, and they were here later that afternoon! When one of our guys said 'The parts are here,' I said, 'What parts?'" Ed laughed.

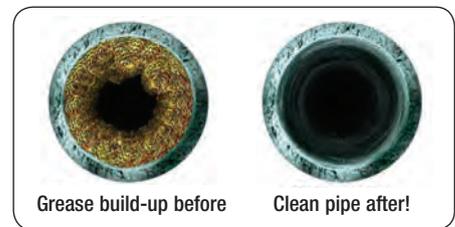
**Ed Brown**  
Chief WW Operator  
Algonquin WWTP  
Algonquin, IL

## Featured Products From USABlueBook®

### Stop grease problems before they start!

Jetfoam, EHC-33 and Big Blue Bio-Blocks remove grease build-up to keep your lines clean and running at full capacity. These environmentally friendly products eliminate stoppages, unpleasant odors and untimely service interruptions. Use separately, or together for a powerful 3-step solution.

For more information on these products, see pages 210-211 in Master Catalog 127.



#### 1 Jetfoam Emulsifier

Use with a sewer jetter to liquefy grease and keep it in suspension. Non-corrosive surfactant blend lets you clean twice as much sewer in the same amount of time.



DESCRIPTION	STOCK #	EACH
5-Gallon Pail	48163	\$ 134.95

#### 2 EHC-33 Bioenzyme

Breaks down proteins, fats and carbohydrates. Industrial-strength bacteria live and reproduce in an environment without free or dissolved oxygen.



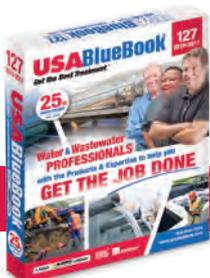
DESCRIPTION	STOCK #	EACH
25-lb Pail of 50 8-oz Quick-Dissolve Bags	48165	\$ 399.95

#### 3 Big Blue Bio-Blocks

Dissolve over 30 to 90 days to continuously add grease-fighting bacteria. Perfect for lift stations or wet wells.



DESCRIPTION	STOCK #	EACH
5-lb Block	49828	\$ 99.95
10-lb Block	49829	199.95
30-lb Block	49831	399.95



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