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DECEMBER 2010

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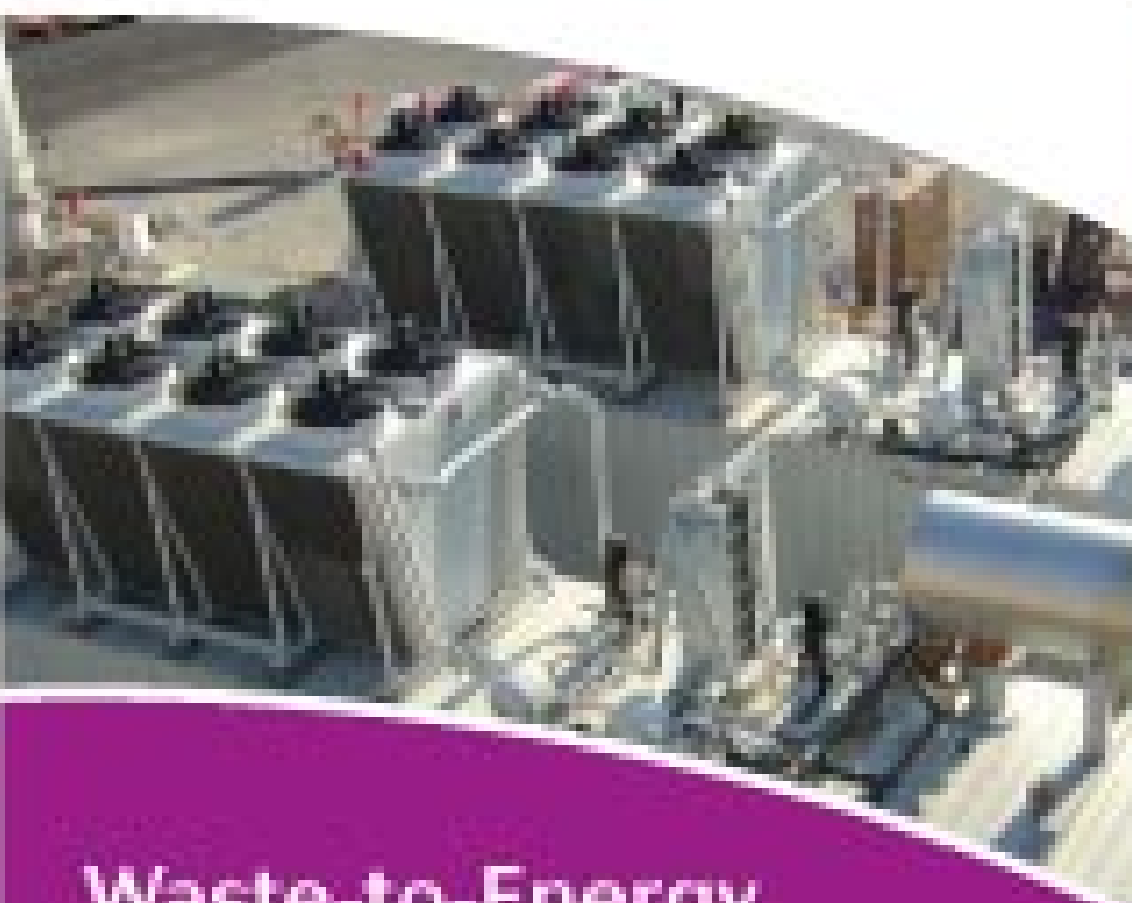
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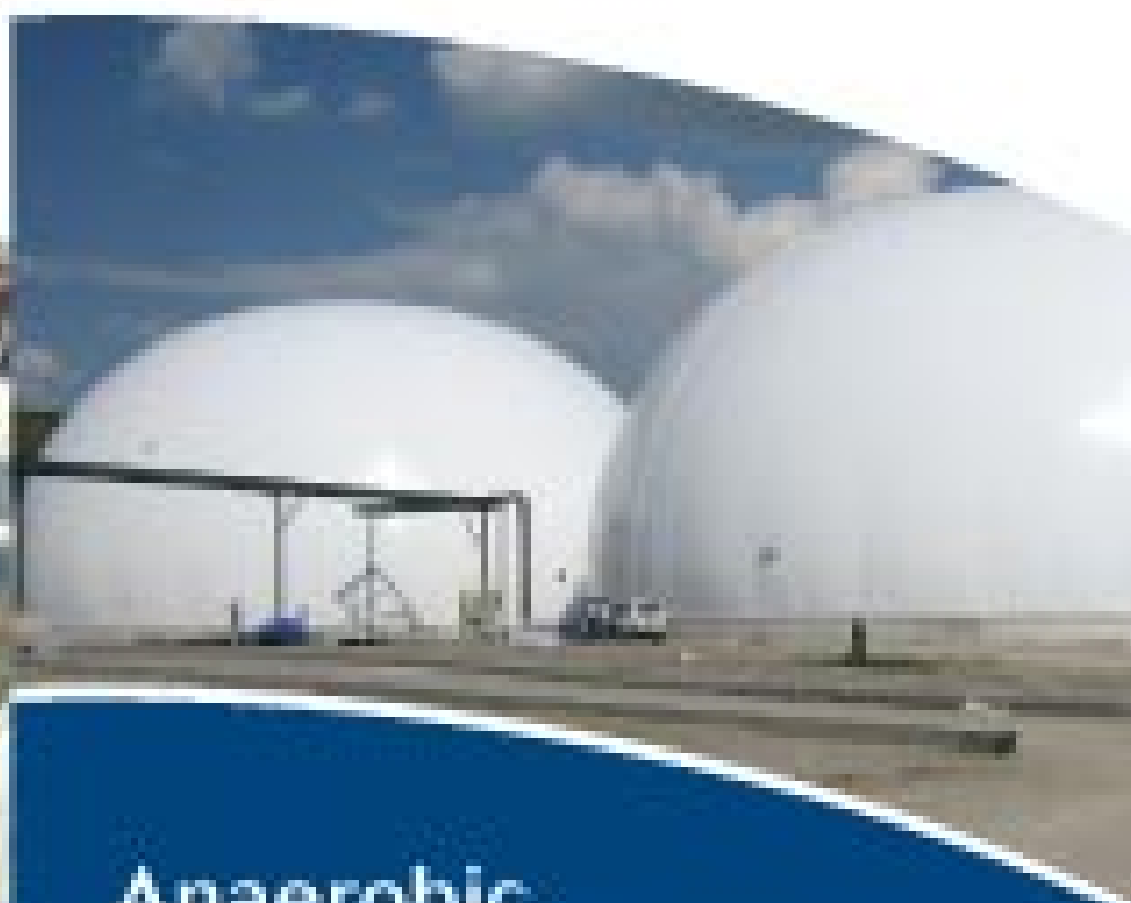
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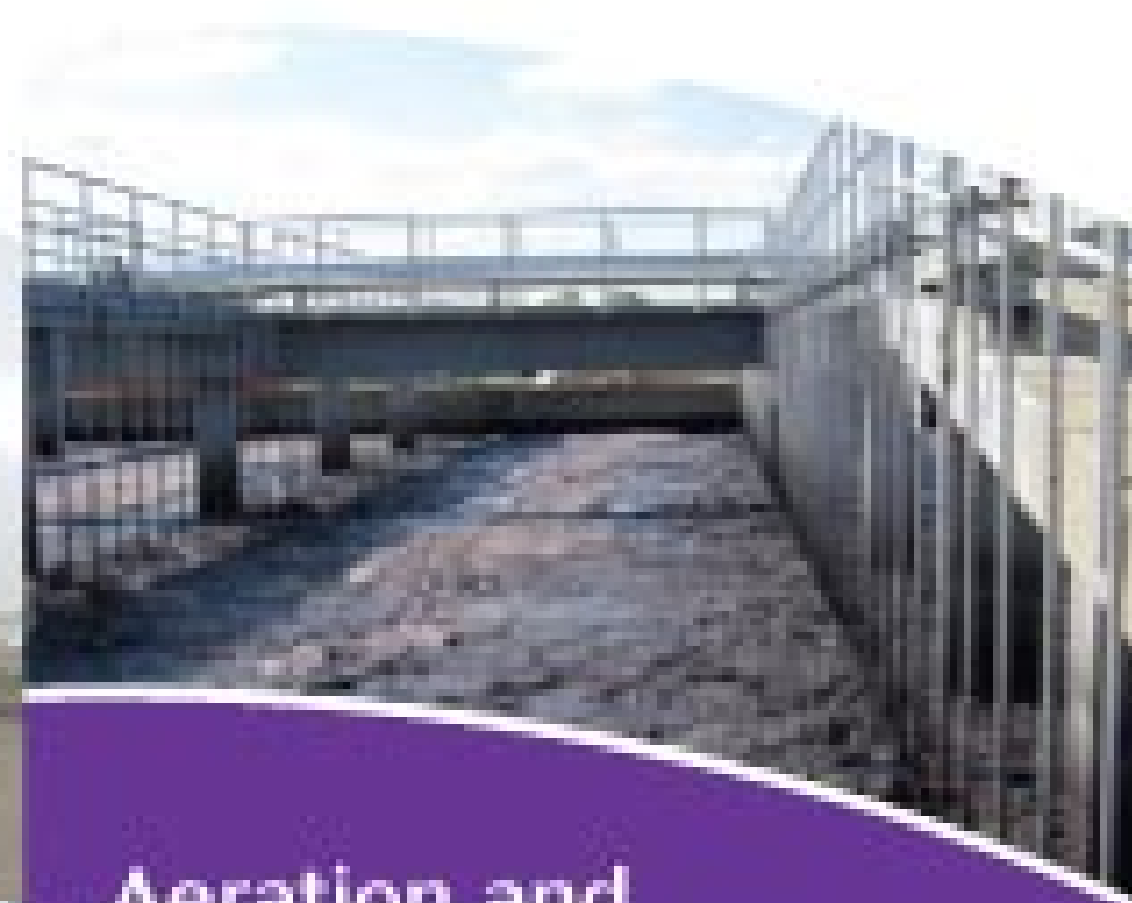
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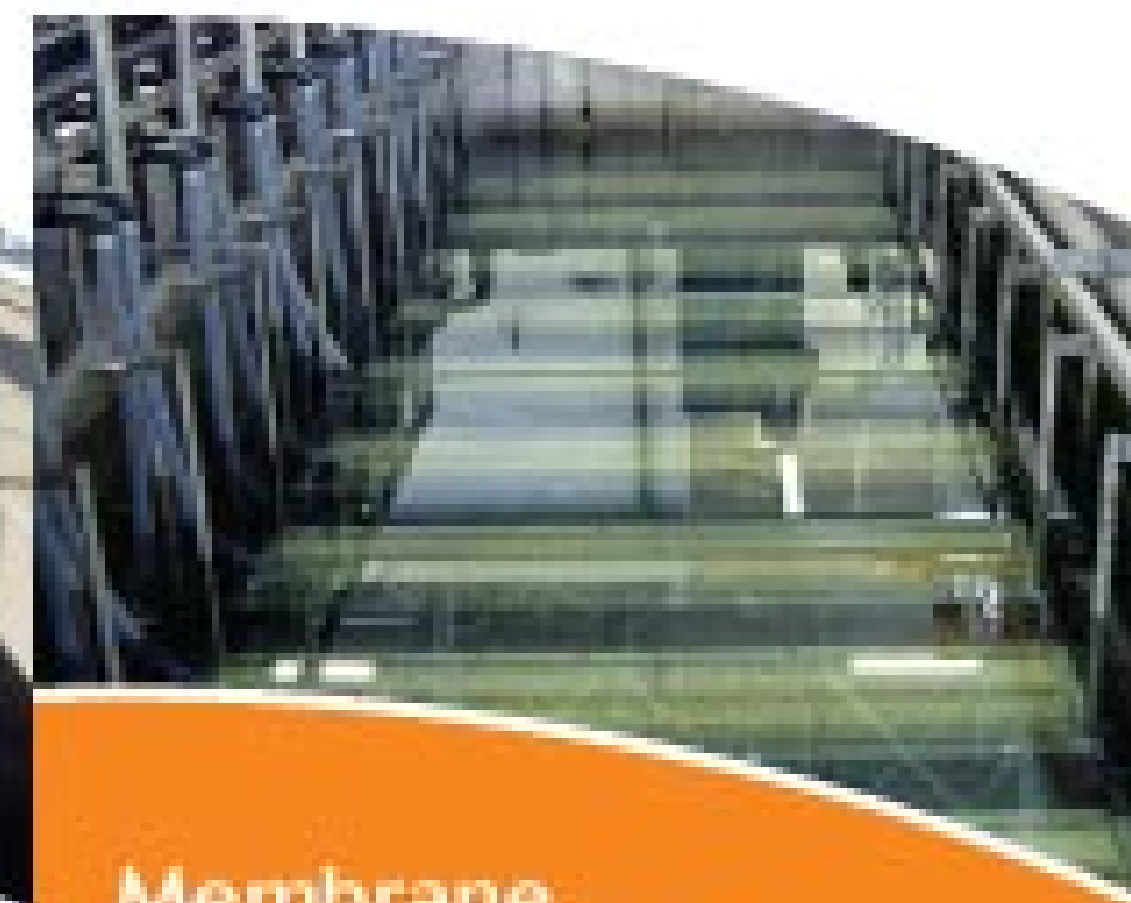
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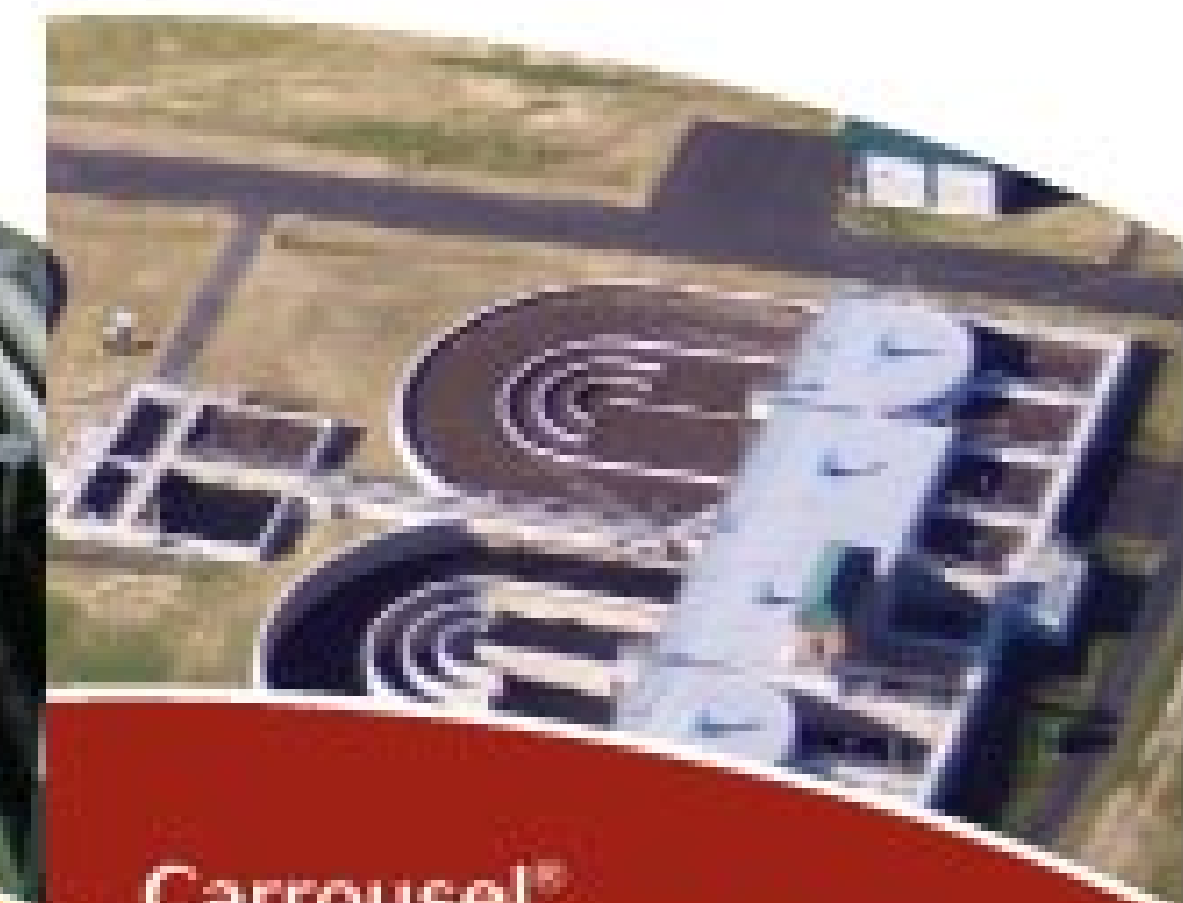
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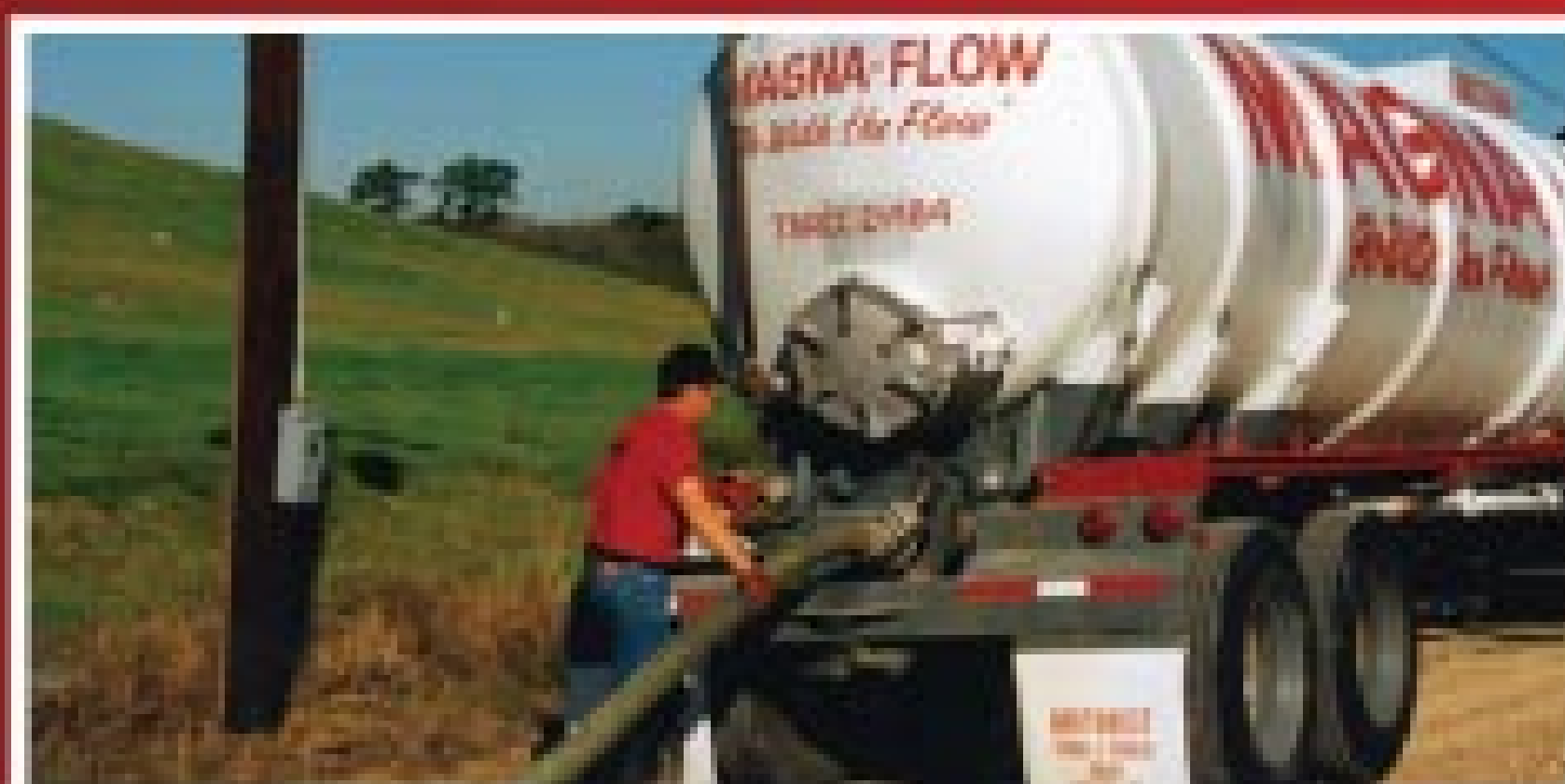
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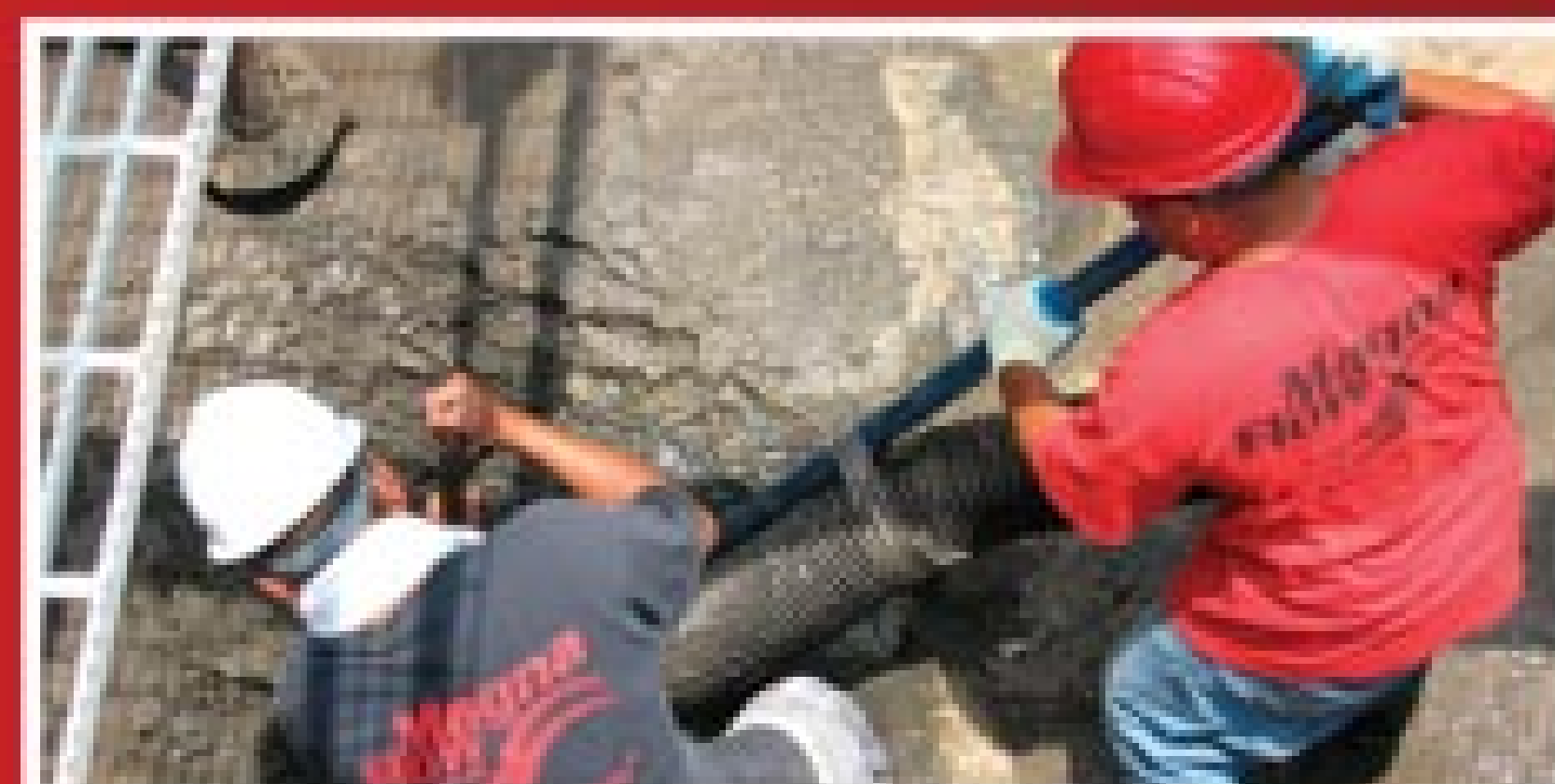
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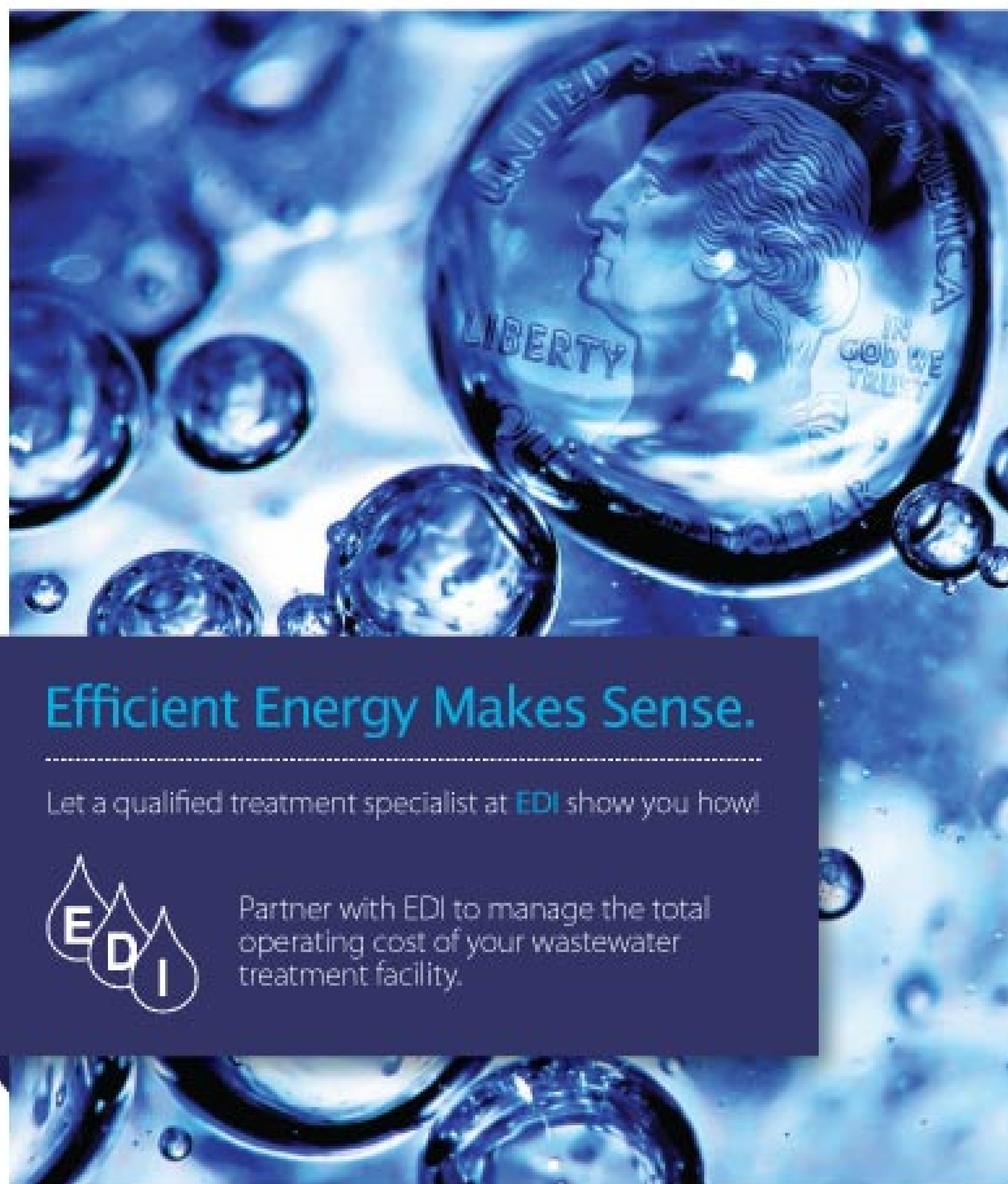


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- Top Performer – Plant: City of Bad Axe (Mich.) Wastewater Treatment Plant
- How We Do It: Protecting concrete in Miami-Dade County, Fla.
- PlantScapes: Total plant landscaping in Fairfield, Ohio
- Greening the Plant: Efficiency enhancements in Two Rivers, Wis.
- In My Words: Recovering from floods in Rhode Island
- Hearts and Minds: Student programs in Mandeville, La.

on the cover

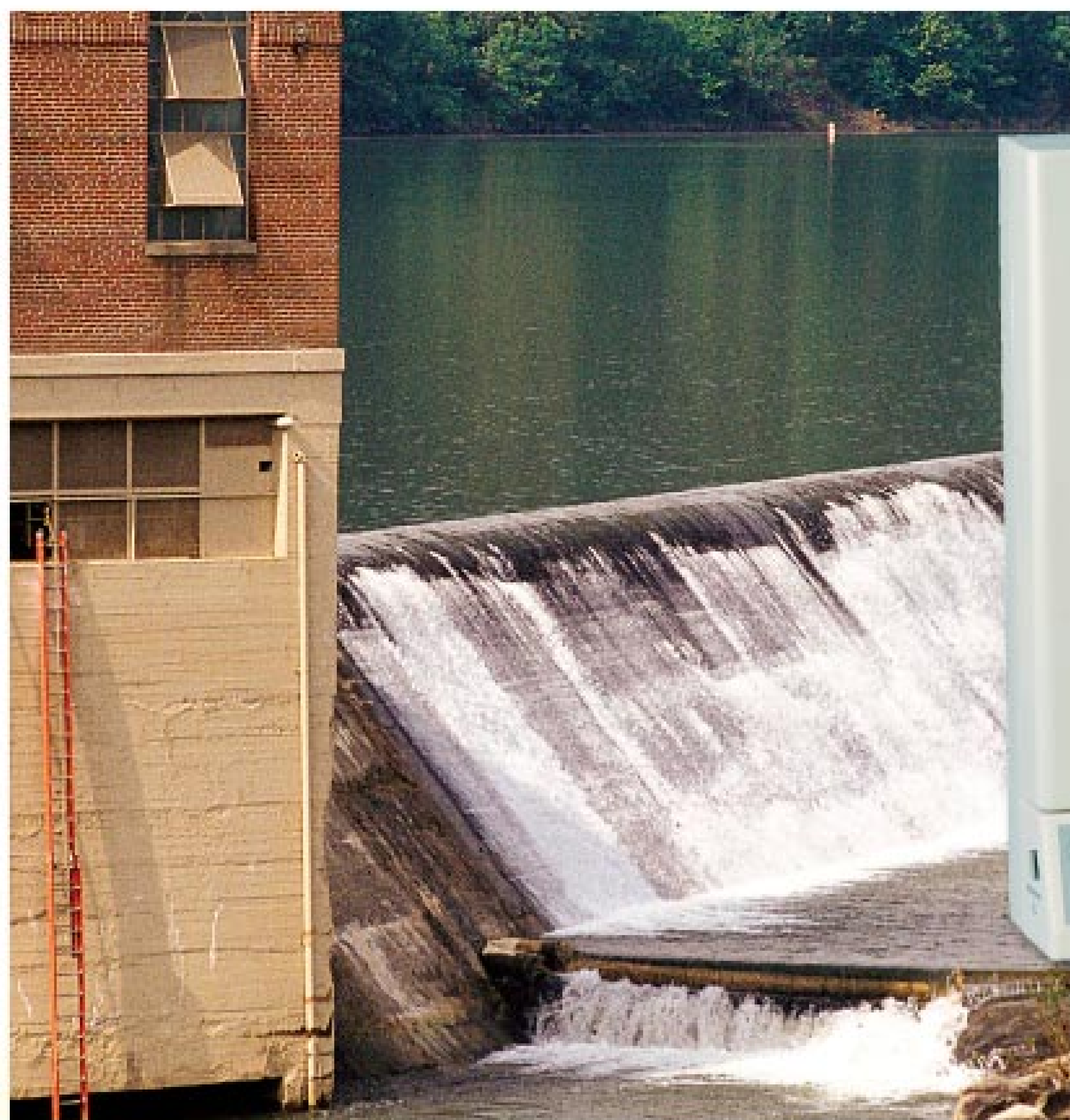
Jim Stewart's wastewater career has spanned 30 years. Today he supervises five operators at the 4.75 mgd (design) advanced secondary treatment Floyd Branch Wastewater Treatment Plant in the Dallas suburb of Richardson. A recipient of the 2009 Texas Water Utilities Association Operator of the Year Award, Stewart recently oversaw a major upgrade of his plant. (Photography by Ross Skeegan)



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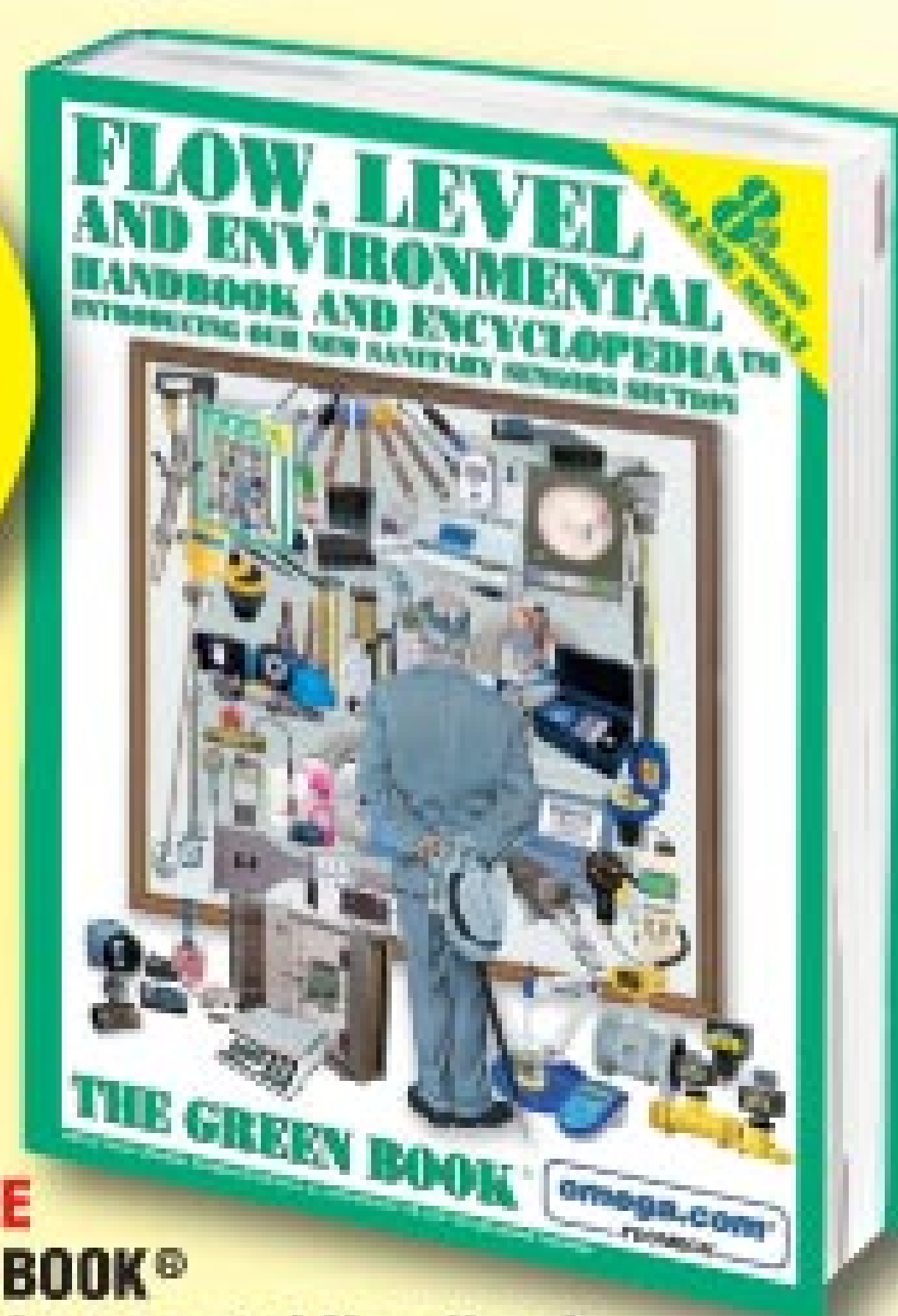
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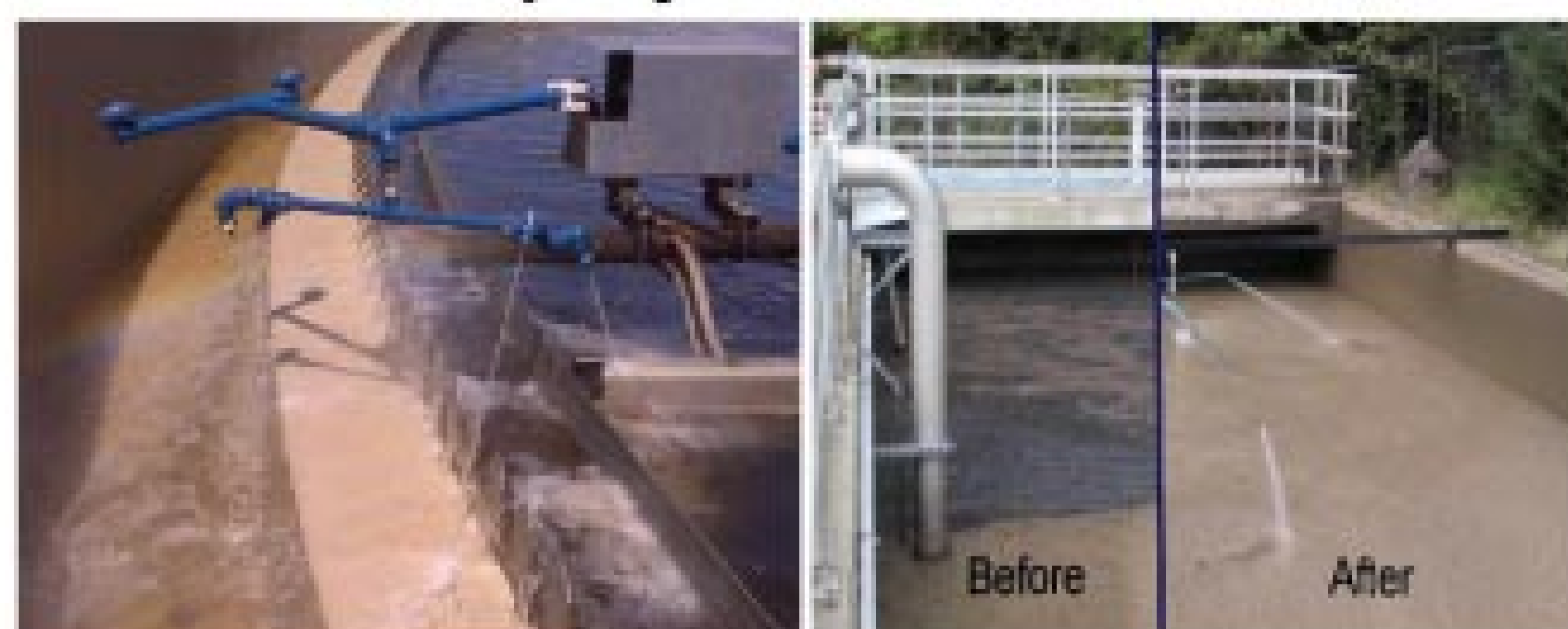
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let's be clear

Can We Talk?

COMMUNICATION IN THE CLEAN-WATER PROFESSION MEANS MORE THAN REACHING OUT TO THE PUBLIC. IT MEANS MORE TALK AMONG DIFFERENT DISCIPLINES ON THE SAME TEAM.

By Ted J. Rulseh, Editor

Our Tech Talk article this month, written by a group of professionals from Texas, makes excellent points about improving communication between engineers and operators. Why on earth shouldn't those two disciplines talk constantly as plans are made for a new treatment plant or upgrade?



Engineers often get accused of living in ivory towers, designing things that don't necessarily work in the real world. But the best engineers I've known are all about creating designs that solve problems for the people on the front lines.

On the other hand, stories in *TPO* have often cited cases where engineers asked to solve a problem proposed a solution costing hundreds of thousands of dollars, only to have operators solve it for a small fraction of that amount. Clearly, disconnects happen.

BIGGER LESSONS

So the article by our Texan friends is worth a read for engineers and operators alike. It also raises a larger point about communication among clean-water professionals in general. One of the most common plaudits we hear for top operators we profile is that they are excellent communicators and team builders.

While they do it in different ways, they manage to get everybody on their teams pulling in the same direction. It makes a person wonder: Is that the norm? Or is it the exception? I heard recently from Rayburn Casey Hall, retired after 37 years as a wastewater operator in Tennessee.

His experience says there is some tension between operators and mechanics. "When I first became an operator, I thought it was my title, and mechanic was a title for a person who repaired the equipment," Hall wrote. "But it didn't take me long to figure out that Operator and Mechanic were our last names, like Hatfields and McCoy's.

"I also found out that just a few first names were used by all Operators and Mechanics. Stupid Operator and Dumb Mechanic. No-good Operator and Lazy Mechanic. Apparently both sides have known an Operator and a Mechanic with the first name Good, because each side is always telling the other that a Good Operator or a Good Mechanic could do the job better.

One of the most common plaudits we hear for top operators we profile is that they are excellent communicators and team builders. While they do it in different ways, they manage to get everybody on their teams pulling in the same direction. It makes a person wonder: Is that the norm? Or is it the exception?

"The Mechanics also have some first cousins called Electricians. The Mechanics and Electricians feud among themselves, but they are allies against the Operators. And the Electricians have some cousins called Instrumentation Technicians. They claim to belong to their own clan because they work with milliamps and millivolts instead of amps and volts. All the members of the above families use the same first names as the Operators and Mechanics."

DOES IT RING TRUE?

That sounds like a pretty dysfunctional team environment. Has your facility experienced anything of the sort? Or are the treatment plant people at odds with any other group? Like the collection system maintenance crew? Or the utility commissioners? Or the City Council?

Anything that creates barriers between groups charged with running an efficient wastewater treatment plant can only be detrimental. Here, we stress the positives. Just as we like learning about plants doing well with technical innovation, we're interested in facilities that are performing well on the people side of things.

So, what communication challenges have you faced? How do you go about building a cohesive team — from the front lines in the plant all the way to the administrative office and governing body?

Send us a note to editor@tpomag.com that briefly tells your story. I promise to respond, and we'll report on some of the more compelling stories on these pages. I hope you've had a rewarding year in 2010, and I wish you all the best in the new year ahead.



Look inside this issue of *Treatment Plant Operator* magazine for your free wall calendar. It comes packaged with the December issue, which completes two years of monthly publication. You can hang this calendar in a convenient place and use it to note important events during your work year. **tpo**

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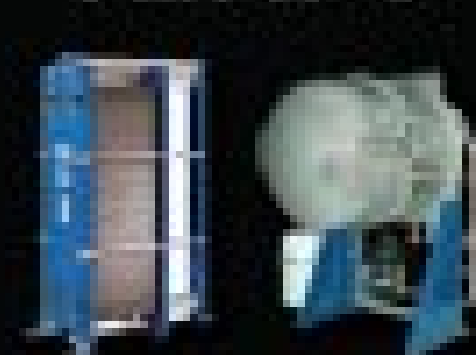
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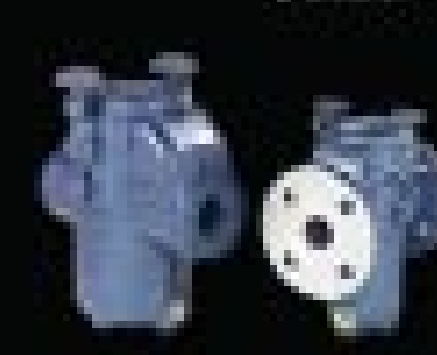
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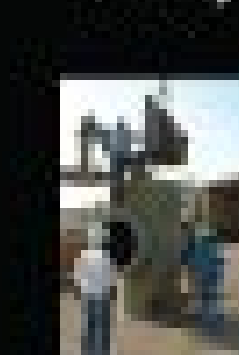
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EMPLOYEES:
8

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average, 4.5 mgd peak

TREATMENT LEVEL:
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TREATMENT PROCESS:
Activated sludge

RECEIVING WATER:
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BIOSOLIDS:
Incinerated off site

WEB SITE:
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Bernie Gooch, left, chief operator, and Grant Weaver, president of The Water Planet Company, are shown beside the anoxic tank at the Town of Suffield Water Pollution Control Facility. (Photography by Jim Michaud)

WHEN A TREATMENT PLANT UPGRADE FAILED TO MEET THE NITROGEN-REMOVAL SPECIFICATION, THE TOWN OF SUFFIELD, CONN., MADE IT HAPPEN BY USING THE EQUIPMENT IN A NEW WAY

By Trude Witham

FOR YEARS, OPERATORS AT THE SUFFIELD WATER POLLUTION CONTROL AUTHORITY WASTEWATER treatment plant tried in vain to meet increasingly stringent total nitrogen discharge limits. It took the help of an innovative engineering consultant and the perseverance and hard work of the operations team to solve the problem.

"We spent \$5.3 million to upgrade our plant so we could bring it into compliance with the new Long Island Sound nitrogen limits, which will become stricter every year until 2014, when our plant will be limited to 45 pounds per day," says chief operator Bernie Gooch. "We also wanted to accommodate a high industrial organic loading and replace chlorination with UV disinfection."

In 2003, the plant's total nitrogen limit was 89 pounds per day. The plant met its limit from then until 2005. The upgrade began in September 2005 and was completed in 2006. By 2007, the nitrogen limit was 55 pounds per day, but the effluent was averaging 75 pounds. It wasn't until August 2009 that the plant again met its nitrogen requirement.

That was after the plant team made a series of process adjustments and diligently monitored progress over several weeks. Today, the plant effluent averages just 12 pounds per day of nitrogen.

DIFFICULT SITUATION

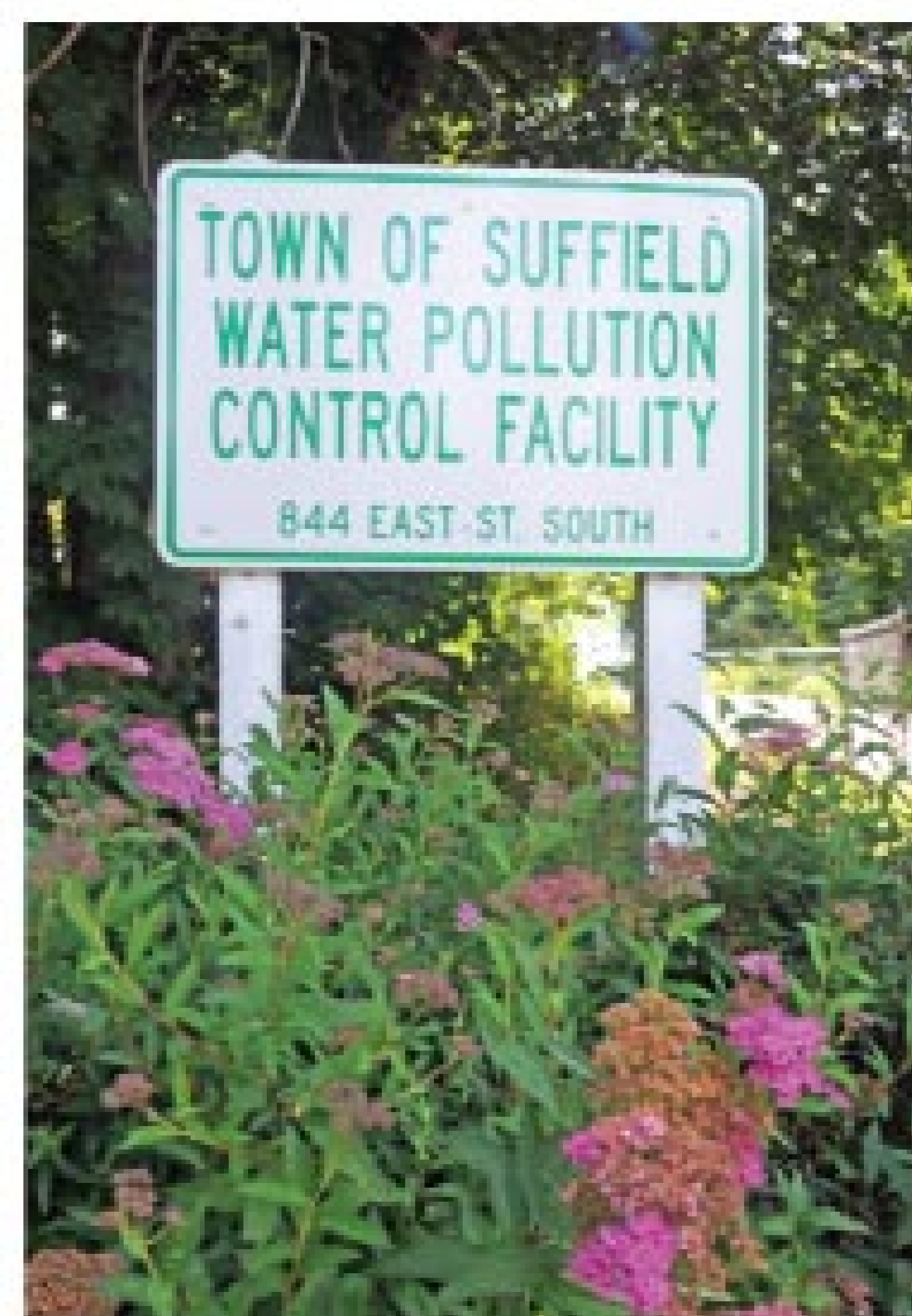
Built in 1989, the 2.03 mgd (design) dual-train, two-step oxidation ditch facility serves about 2,900 residential and 100 commercial, industrial and institutional customers, including an ice cream plant and MacDougall-Walker Correctional Institution. The plant discharges to the Connecticut River, which empties into Long Island Sound.

The original plant was undersized to treat the high BOD loading from the ice cream plant. Suffield conducted an engineering study in 2004 to address that issue, as well as concerns about the nitrogen limits.

The subsequent upgrade included a pre-anoxic tank, two internal recycle pumps (ABS), a new final clarifier (WesTech), and UV disinfection (Trojan Technologies). To improve sludge settling, the anoxic tank was built as a series of small tanks — a "selector."

After the new clarifier was added, effluent BOD and TSS were consistently below 5 mg/l, easily meeting the 30 mg/l permit limit. But nitrogen was unaffected, even though the plant staff followed the anoxic equipment settings established by the design engineer.

"What made the situation even more difficult was that the engineering company that did the upgrade eliminated all the meters



The sign at the entrance to the Suffield, Conn., Water Pollution Control Facility.



The treatment plant pumphouse is shown at the right; two of the final clarification tanks in the center; and the UV disinfection tank at the far left.

"Every July, we had gotten a check from the DEP in nitrogen credits, and everyone liked that. But then we had to start paying the DEP."

BERNIE GOOCH

from the project plan due to budget constraints," says Gooch. "They said we didn't need to monitor the process, as it would work fine."

METERS ADDED

In the end, Suffield added the meters three years after the pumps were installed, using operating funds. The equipment included:

- ITT – Royce Technologies dissolved oxygen (DO) meters installed in the two oxidation ditches and wired to the computerized control system. Staff programmed the SCADA system to control aeration mixer speeds to maintain established DO settings.
- Hach oxidation-reduction potential (ORP) meters in the pre-anoxic tank to monitor biochemical activity in the anoxic tanks. The meters made it possible to operate the anoxic (low-oxygen) tank in a zero-oxygen (anaerobic) mode.
- Variable-frequency drives (VFDs) on the new internal recycle pumps to provide operator control of the pumping. As installed, the equipment could be operated in a fully on or fully off mode only.
- A Hach nitrate-nitrogen analyzer, connected the plant control system to provide continuous monitoring of effluent quality.

In trying to improve nitrogen removal, plant staff experimented with conventional process adjustments, such as changing the mixed liquor concentration, changing DO settings, and changing the return activated sludge pumping rate. Nothing worked.

As word of the difficulties spread, engineering firms started offering help. Suffield eventually connected with Grant Weaver, president of The Water Planet Company of New London, Conn. A Professional Engineer and ABC licensed Class 4 wastewater operator, Weaver has 30 years' experience as a municipal operator/administrator in treatment plants from less than 0.5 mgd to 100 mgd.

Bernie Gooch uses a dissolved oxygen analyzer from ITT – Royce Technologies to check the performance of the anoxic tank.



Suffield Wastewater Treatment Plant PERMIT AND PERFORMANCE

	PERMIT	EFFLUENT (monthly average)
TSS	30 mg/l	5 mg/l
BOD	30 mg/l	5 mg/l
Total N	51 lbs/day 2010 45 lbs/day 2014	12 lbs/day (1.8 mg/l)
Ammonia	N/A	<0.1 mg/l
Total P	N/A	<0.5 mg/l

Weaver knew right away what to do. “When I came in, my initial reaction was that the internal recycle rate was too high,” he says. “Contrary to what you read, too high a nitrate recycle rate adversely affects treatment. So we turned that down and then changed the aeration rate.”

SOLVING THE PROBLEM

In summer 2009, Weaver and the plant’s staff made a variety of process changes. They turned off one of the two fixed-speed internal recycling pumps (2,000 gpm) and operated the second 18 hours a day.

A few weeks later, they changed the mechanical aeration mixer settings to provide less aeration in the first pass and more in the second — the opposite of the design engineer’s settings.

Again a few weeks later, they adjusted the sludge holding tank blower to operate only when the sludge press is operated — about 3.5 hours a day — instead of continuously. The staff also ran daily testing of ammonia, nitrite, nitrate and alkalinity to monitor results — an important component of making the improvements. Weekly lab testing of nitrogen parameters continued.

Some relatively minor changes in the equipment settings created new bacterial habitats and significantly altered treatment:

- The reduced internal recycle rate doubled the hydraulic retention time in the pre-anoxic zone, making the tank anaerobic. As a result, the tank now provides additional organic-nitrogen removal — an improvement of 0.7 mg/l.
- The short initial aeration zone solubilizes the high-particulate BOD waste from the ice cream plant and provides a ready supply of BOD to promote nitrate removal in the subsequent anoxic zone — a 4.6 mg/l improvement.
- The longer retention time in the second aeration zone that results from the reduced internal recycle rate provides for more consistent, complete ammonia removal — a 0.1 mg/l improvement.

POSITIVE RESULTS

Although things got worse during the first six weeks after these changes,



ABOVE: Nick Padrevita, operator II, works on the filter press. RIGHT: Bernie Gooch holds samples of water, before and after treatment.



the staff spent considerable time and effort tweaking the process. It paid off: Today’s total nitrogen loading of 12 pounds per day is less than one-sixth of the 79 pounds before the changes were made, and one-third of the 2014 discharge limit of 45 pounds.

Effluent ammonia has improved slightly and is now consistently 0.1 mg/l or less. Effluent TKN dropped to less than 1.0 mg/l — a 0.7 mg/l organic-nitrogen reduction. Effluent nitrite plus nitrate has been reduced to less than 0.5 mg/l — a 4.6 mg/l decline in nitrate.

The new nitrogen results were so good that even the state Department of Environmental Protection at first did not believe the results. “They sent an inspector out to the plant to pick up a sample because they wanted to see for themselves if the numbers were correct,” says Gooch.

Weaver has presented papers about the Suffield plant in hopes of helping other operators with similar issues. In January 2010, he and Gooch presented at the New England Water Environment Association conference in Boston. They are scheduled to present at the National Nutrient Council meeting in Miami in January 2011.

AN EXPERIENCED TEAM

The staff at the Suffield Water Pollution Control Facility has been through three substantial upgrades. In 1998, the plant added a Stranco (Siemens) polymer system and converted four 75 hp aerators to variable-frequency drive control (Northeast Utilities). In 2005, a Huber step screen was added.

The major upgrade, completed in 2007, saw the addition of TrojanUV3000Plus disinfection, ABS pumps and mixers, a WesTech grit system with WEMCO pumps, a WesTech clarifier, programmable logic control, GE-Intellution SCADA, radio alarm system, flow metering, Hach nitrate and ORP measurement, and ITT – Royce DO measurement.

The experienced team is led by Bernie R. Gooch, Jr., chief operator, who started in 1996. He holds a Class 4 wastewater operator license, Class 4 NEWEA collection system certification, and state lab certification. Other members of the staff are:

- Julie Nigro, business administrator, who started in 2004. She handles residential and commercial billing, accounts payable and record keeping and assists Gooch with annual budget preparation.
- Craig O'Neil (Class 4), shift operator, started in 1989 and handles process control.
- Wes Soloshun (Class 3), instrumentation and programming operator II, started in 1984 and handles PLC programming, electrical work, data acquisition and backup systems.
- Jack Phillips (Class 2), lead collection system operator, started in 1992. He maintains 20 lift stations and 65 miles of sewer.
- Jim Rusczyk (Class 2), collection system operator, started in 2001. He helps with collection system maintenance and assists with plant maintenance.
- Nick Padrevita (Class 2), solids handling operator II, started in 1995.
- Ed Golec (Class 1), lab technician, started in 1993.



Operator II Wes Soloshun, left, and shift operator Craig O'Neil change bulbs in the Trojan Technologies UV disinfection system.

OPERATORS ARE KEY

Although Weaver's methods have been successful at many other facilities, the success depends on plant operators. "Whenever I go into a plant, it's up to the operators to make it work and to prove me right or prove me wrong, and I like it that way," he says.

That was certainly true in Suffield, where Gooch and his team worked hard to implement the process changes and then measure the results. Measurements included daily field tests with inline instruments, test strips and colorimeters, and weekly review of lab data. The staff was aware of conditions required for optimal nitrogen removal (especially ammonia and nitrate) and maintained ongoing communication with Weaver.

It wasn't an easy time for the plant's six operators, who had already dealt with the high BOD loadings from the industrial waste, the long upgrade process, and the nitrogen specification disappointment that followed.

"Every July, we had gotten a check from the DEP for nitrogen credits, and everyone liked that," says Gooch. "But then we had to start paying the DEP. Plant personnel never knew what the cost of not meeting the nitrogen specs was going to be, and it was very difficult to budget around that. The plant

ended up paying \$25,000 over those three years, whereas in the past four years, we had gotten back \$20,000."

Weaver recalls, "When I entered the picture, the operators weren't really angry at anyone, just frustrated. Once I proposed a solution, everyone wanted to make the new process work, and they got enthused."

The tedious daily testing proved to be just one more challenge. "Nobody had ever made them do this before, and they wondered if I wasn't having them do my busy work," Weaver recalls.

Gooch adds, "At first the operators said 'Why am I doing all this?' But then it started to click." Gooch set an example for everyone with his determination and can-do attitude. "Bernie is one tough guy who doesn't back down," says Weaver. "That comes from his eight years in the army."

RENEWED SUCCESS

The plant supervisor and foreman have now retired, leaving fewer people to do the work. On top of that, the plant now has even more customers. Still, the staff is satisfied with the way things are going.

"What makes the plant successful is the competency of the staff and the fact that the operators have been with us for a while," says Gooch. "It's a small community where everyone knows everyone. Four of the eight employees and the commission members live in town. The operators are getting pats on the back and being told by the commission and the public that they're doing a great job. There is a renewed sense of pride."

In the near future, the plant operators will experiment with further process modifications to maintain the high nitrogen removal while using less energy. These will include using even less recycle, lowering the aeration, and possibly operating one or more of the mechanical aerators on timers so that there are periods of off time. This will reduce the facility's carbon footprint, and may save \$50,000 a year in electricity costs.

Gooch says his goal is to operate within his budget and have the best-running plant possible. He offers this advice to operators everywhere: "Never back down from a challenge." **tpo**

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people/awards

The **Littleton/Englewood (Colo.) Wastewater Treatment Plant** received a Grand Award from the American Council of Engineering Companies, and a National Research Technology Award from the National Association of Clean Water Agencies.

The **City of Nogales' (Ariz.) International Wastewater Treatment Facility** project received a Public Works Project of the Year Award from the American Public Works Association.

The **Alabama Water Environment Association** announced award recipients:

- Mercedes-Benz U.S. International (Vance), Plant Excellence in Industrial Wastewater Treatment Award (Plant and Chemical Treatment)
- Boise White Paper LLC – Jackson Mill (Jackson), Plant Excellence in Industrial Wastewater Treatment Award (Biological Treatment)
- BASF Chemical (McIntosh), Plant Excellence in Industrial Wastewater Treatment Award (Physical, Biological and Chemical Treatment)
- Thorsby Lagoon (Thorsby), Plant Excellence in Public/Private Domestic Award (Lagoon System)
- Warrior Wastewater Treatment Plant (Jefferson County), Plant Excellence in Public/Private Domestic Award (<1.0 mgd)
- Daphne Water Reclamation Facility (Daphne), Plant Excellence in Public/Private Domestic Award (1-10 mgd)
- Catoma Wastewater Treatment Plant (Montgomery), Plant Excellence in Public/Private Domestic Award (>10 mgd)
- Rob Coleman, Carter & VerPlanck Inc., Arthur Sidney Bell Award
- Scott Cummings, CH2M HILL Inc., WEF Delegate Service Award

The **National Association of Clean Water Agencies** honored five wastewater treatment plants in Honolulu, Hawaii:

- Waianae, Platinum Award
- Wahiawa, Kailua Regional and Honouliuli, Gold Awards
- Sand Island, Silver Award

The **Iowa Water Environment Association** announced award recipients:

- Kevin Jacobson, Story City, William D. Hatfield Award
- Glen Peterson, Iowa Great Lakes Sanitary District, Harris F. Seidel Education Award

The **Kentucky Tennessee Water Environment Association** elected officers: Robin Fothergill, Tennessee vice president; Saya Qualls, Tennessee delegate.

The **Water Environment Federation** presented the 2010 WEF Excellence Awards at the WEF Awards and Presidential Celebration Reception during WEFTEC 2010 in October in New Orleans. Recipients include:

- Collection Systems Award, William C. Carter, Jr.
- Collection Systems Published Contributions Award, L. Burton Curry, Joseph Kavanagh, Tim Kelleher, Dave Lookenbill, Derek L. Morin, and Paul Tomaskovic
- Eddy Wastewater Principles and Processes Medal, Victoria Francesca Row-sell, Dawn Sok Cheng Pang, Foteini Tsafou, and Nikolaos Voulvoulis
- Emerson Distinguished Service Medal, Joe C. Stowe, Jr.
- Engelbrecht International Achievement Award, Dr. Charles A. Sorber
- Fair Distinguished Engineering Educator Medal, Dr. Daniel Noguera
- Operational Improvement Medal, Walter Bailey, Alan Cassel, Sudhir Murthy, Dilli Neupane, Marija Peric, and Rumana Riffat
- Robert H. Hite Award (presented by Water For People), Betty Jordan
- Industrial Water Quality Achievement Award, SunOpta Ingredients Inc.
- Industrial Water Quality Lifetime Achievement Award, C.P. Leslie Grady, Jr.
- Innovative Technology Award, Super-Saturated Dissolved Oxygen Injector (SDOX), BlueInGreen LLC, Process Category
- Morgan Operational Solutions Award, Paul Dombrowski
- Outstanding Member Association Award, Illinois Water Environment Assoc.
- Outstanding Young Water Environment Professional Award, John McGettigan, P.E.

- Presidential Recognition Award, Bjorn von Euler
 - Public Officials Award, Jerry N. Johnson, General Manager of the Washington Suburban Sanitation District (Md.), and Mayor Clay Larkin, Post Falls, Idaho
 - Public Education Award, Julianne T. LaRock, Individual, and the City of San Diego Public Utilities Department
 - Rudolfs Industrial Waste Management Medal, Clifford A. Merritt
 - WEF Canham Graduate Studies Scholarship, Patrick McNamara
- Please send contributions to this listing to editor@tpomag.com.*

education

Alaska

The Alaska Water Wastewater Management Association has these courses:

- Dec. 2-3 – Sustained Compliance, Fairbanks
 - Dec. 7-9 – Electrical Controls for Operators, Fairbanks
- Visit www.awwma.org.

Michigan

The Michigan Water Environment Association has these courses:

- Dec. 8 – Process Seminar, East Lansing
 - Dec. 20-21 – Wastewater Administrators Conference, Frankenmuth
- Visit www.mi-wea.org.

Ohio

The Ohio Water Environment Association has a Biosolids Workshop on Dec. 9 in Columbus. Visit www.ohiowea.org.

Pacific Northwest

The Pacific Northwest Clean Water Association has a Safety and Occupational Health Committee Webinar on Dec. 9. Visit www.pncwa.org.

South Carolina

The Water Environment Association of South Carolina has a Distribution/Collection School Jan. 24-27 in Myrtle Beach. Visit www.weasc.org.

Texas

The Texas Water Utilities Association has these courses:

- Dec. 14-16 – Wastewater Collection, Waco
 - Jan. 11-13 – Utility Safety, Kingsville
- Visit www.twua.org.

The Water Environment Association of Texas has a Collection Systems Conference Jan. 12-13 in San Marcos. Visit www.weat.org.

Wisconsin

The Wisconsin Department of Natural Resources has a Utility Management course Dec. 7-8 in Madison. Visit www.dnr.state.wi.us/org/es/science/opcert/training.htm.

The University of Wisconsin Department of Engineering-Professional Development has a Collection System Engineering (L691) course Dec. 7-9 in Madison. Visit www.epd.web.engr.wisc.edu. **tpo**

TPO invites your national, state or local association to post notices and news items in this column. Send contributions to editor@tpomag.com.

CALENDAR OF EVENTS

Jan. 23-26

New England Water Environment Association Annual Conference and Exhibit, Boston Marriott Copley Place Hotel, Boston. Visit www.newea.org.

March 2-5

Pumper & Cleaner Environmental Expo International, Kentucky Exposition Center, Louisville, Ky. Call 800/257-7222 or visit www.pumpershow.com.

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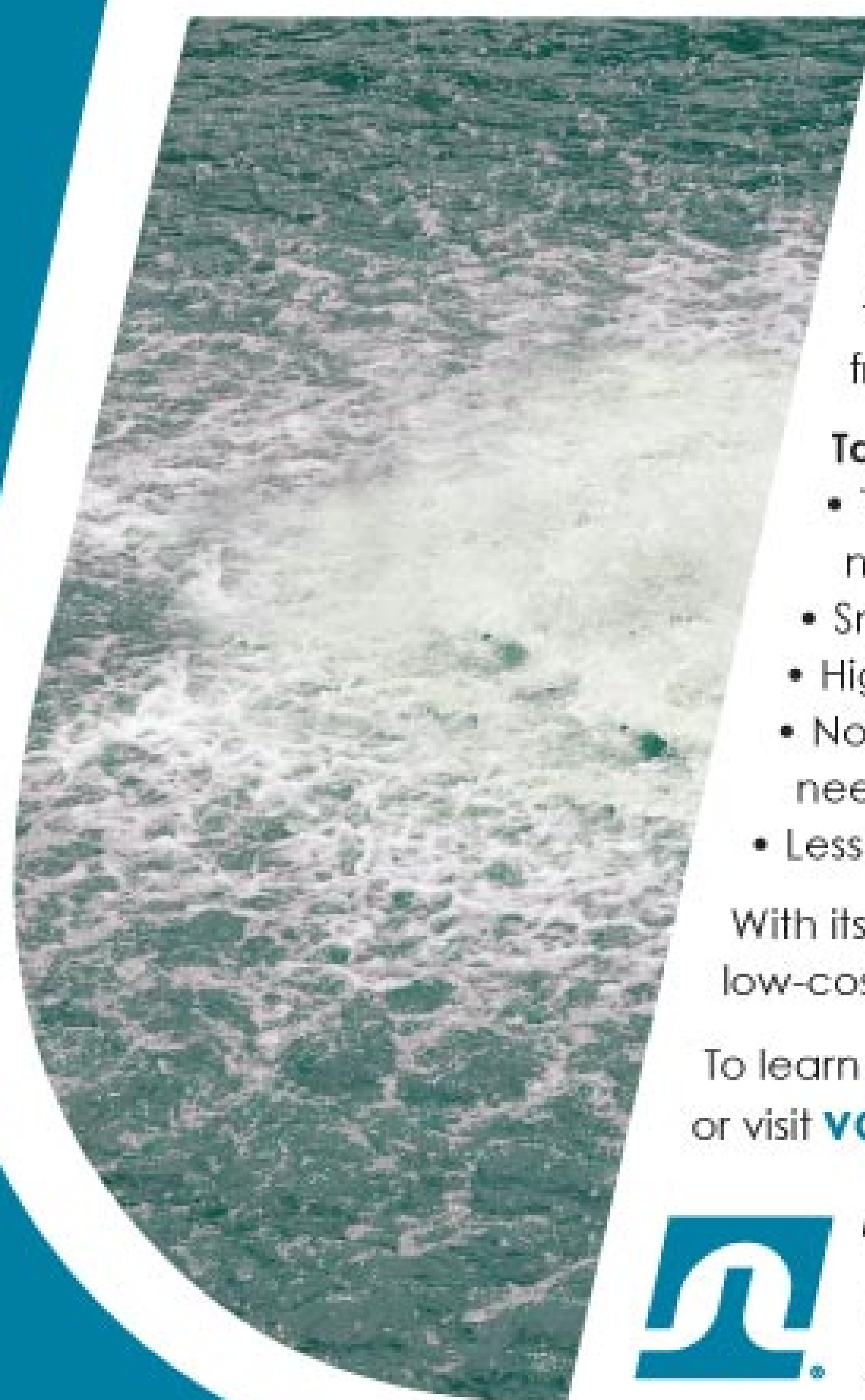
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Making a Good Thing Better

A MINNESOTA TREATMENT PLANT APPLIES MICROTURBINE COGENERATION TO CUT NATURAL GAS AND ELECTRICITY COSTS AND REDUCE THE CARBON FOOTPRINT

By Doug Day

Microturbines are nothing new to the Albert Lea (Minn.) Wastewater Treatment Facility on the banks of the Shell Rock River. With more than seven years of experience using four digester-gas-fueled microturbines for cogeneration (combined heat and power), plant superintendent Rick Ashling says the equipment was a good investment and continues to provide savings now that ownership of the units has reverted to the city.

"Our utility, Alliant Energy, approached us because they were looking for renewable energy credits," says Ashling. "They would own the turbines, do the installation, and operate and maintain them for five years."



Two carbon filters (foreground) and three gas compressors clean the digester methane for the microturbines. Recaptured heat from the turbines supplements four boilers (background) for heating the anaerobic digesters and the plant.

FUNDING ASSISTANCE

The original plan was to install two C-30 microturbines from Capstone Turbine Corporation. After considering the idea, the city, in southeast Minnesota, decided to buy two more at a cost of \$76,000. The Minnesota Conservation Improvement Program provided \$85,000 toward the \$250,000 project, and Alliant Energy funded the remaining \$89,000. It was the first use of microturbines in the state, according to Ashling.

The first 30 kW microturbine went online in October 2003, and the other three followed in 2004. The project also included equipment for gas collection, conditioning and compression, electrical connections, and automation gear.

The turbines generate about 800,000 kWh per year toward the plant's 8 million kWh of annual electricity usage. About 28 million Btu is captured daily from the turbines for supplemental heating of the anaerobic digesters and space heating in the plant.



Plant superintendent Rick Ashling says his four C-30 microturbines from Capstone Turbine Corporation are cutting his energy bill by about 25 percent every year.

"We are generating more than \$100,000 in savings every year," says Ashling.

"About \$40,000 of that is electricity savings. Heat recovery saves about \$62,000 in natural gas. And we are reducing the carbon footprint of the plant by not burning fossil fuels to generate electricity and by not flaring off our methane." The project achieved payback in four years, while Albert Lea recovered its investment in two years.

The cooperative effort earned the 2004 Minnesota Government Reaching Environmental Achievements Together Award, which recognizes waste and pollution prevention, conservation and recycling by government agencies.

WATCHING CLOSELY

After seven years, Ashling and his team are happy with the microturbines, and they've made it a high priority to take advantage of them. "I believe in this," Ashling says. "We had to rethink the way we manage solids to make sure we feed the digesters with the thickest solids we can to produce the maximum amount of methane."

Operators closely monitor dissolved oxygen in the activated sludge process to minimize the use of the two 400 hp and three 600 hp blowers. "We've been successful with that," says Ashling. "We save \$10,000 a month by watching the organic loading."

Success continued even after the city took over ownership, and the \$30,000 annual cost of maintenance, nearly two years ago. "We're getting a net savings of about \$77,000 a year," Ashling says. That equals about a 25 percent reduction in the plant's overall energy use, along with the prevention of emissions related to producing electric-

What's Your Story?

TPO welcomes news about environmental improvements at your facility for future articles in the Greening the Plant column. Send your ideas to editor@tpomag.com or call 877/953-3301.

IS COGEN RIGHT FOR YOU?

Installing a cogeneration system at a wastewater treatment plant is a decision that often comes down largely to economics. The U.S. EPA says that if you can answer yes to two or more of five key questions, your plant could be a candidate:

- Do you have an influent flow rate greater than 5 mgd?
- Do you pay more than 6 cents per kWh for electricity?
- Are reliable, high-quality power and thermal energy important to you?
- Is it important to reduce energy costs and increase the overall energy efficiency of your treatment process?
- Do you want to increase your facility's environmental performance?

"We are generating more than \$100,000 in savings every year. About \$40,000 of that is electricity savings. Heat recovery saves about \$62,000 in natural gas. And we are reducing the carbon footprint of the plant by not burning fossil fuels to generate electricity and by not flaring off our methane."

RICK ASHLING

ity at power plants or burning natural gas. "There was even a time when the utility called to check the gas meter because they thought it was broken," Ashling recalls.

He expects the savings to increase now that the utility has received approval of a temporary rate that could hit 22 percent. Still, the plant buys energy off the grid and may have to raise customers' rates to meet the added expense of about \$9,000 a month. "Our city is faced with the same problem as other cities, keeping costs down," he says.

Rising energy costs create a quandary for wastewater treatment plants: pay more for operations or make a large capital expenditure to reduce usage. Ashling had a plan to add three 60 kW microturbines, but funding is a problem in tight economic times.

ALWAYS EXPLORING

The same is true of wind energy, which he has been considering for some time. He says the city was close to an agreement on two wind turbines but couldn't reach a mutually satisfying agreement with the developer. "We also continue to look at the way we do things in order to reduce our power consumption," Ashling says. "We work with our blowers and try to be as efficient as we can with those."

The plant has not yet switched to variable-speed blowers but has tested them. "We keep studying ways to reduce our air demand," says Ashling. "We constantly look at expansion of renewable energy, but we're also looking for financial assistance to do it. Any expansion of the system will require some sort of state or federal assistance."

And Ashling is keeping his eyes open for more opportunities to reduce costs and environmental impact while protecting ratepayers. **tpo**

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top performer: **BIOSOLIDS**

WHEN THE CITIZENS OF KERN AND VENTURA COUNTIES SPOKE UP, CLEAN-WATER PROFESSIONALS LISTENED. Until 2009, biosolids produced in Ventura County were hauled 150 miles away from the California coast for land application in Kern County.

Ventura County residents weren't happy with the miles logged hauling 8,000 tons of biosolids every month, and the residents of Kern County weren't keen on taking material from outside their county's boundaries.

So, in 2005, Ventura Regional Sanitation District (VRSD) officials began to design a new facility. In 2009, they flipped the switch. Now, rather than making a long haul, biosolids are trucked from four wastewater treatment plants, none more than 40 miles away, to the Toland Road Landfill in Santa Paula.

TRUCKING COSTS DOWN

While a landfill is not usually a prime site for a biosolids facility, it made logistical sense in this case: The biosolids and the landfill have a symbiotic relationship. The landfill provides methane to power the drying system and ancillary equipment. And the end product, Class A biosolids, provides alternate daily cover at the landfill.

Closer to *Home*

VENTURA COUNTY BIOSOLIDS, ONCE TRUCKED A MILLION MILES A YEAR, NOW ARE DRIED TO PROVIDE DAILY COVER MATERIAL FOR A LOCAL LANDFILL

By Diane Gow McDilda

The process cuts out about one million miles of annual truck traffic between Ventura and Kern Counties, eliminating about 1,800 tons of carbon dioxide emissions. It also uses landfill methane as a valuable fuel and eliminates the purchase of some landfill cover material.

Greg Grant, P.E., solid waste division manager for VRSD, was involved in the design and location of the biosolids facility. "Kern County didn't want the solids, and Ventura County didn't want them trucked so far," says Grant. "We were looking for a greener, large-scale, acceptable method for handling the biosolids."

With a gas collection system in place and available land for equipment, the landfill is now home to the Biosolids Drying and Renewable Power Generation Facility. And the crew of landfill operators has taken on day-to-day system operations. "It's very innovative," says Grant. "It's a nice-looking structure. It's a beast of a machine, but it's fairly hands-off."

MAKING THE TRIP

Ventura County operates four wastewater treatment plants: Thousand Oaks, Oxnard, Fillmore, and Ventura. Each has anaerobic digesters and belt


presses that produce material at about 15 percent solids, all of it hauled in semi-trailers to the landfill.

With a population of 200,000, the City of Oxnard produces the most biosolids. Four trucks from there make the drive to the landfill every day. Ventura and Thousand Oaks each send two truckloads per day, and the City of Fillmore, population of 15,000, sends just one a week.

Dan Pfeifer, Ventura wastewater superintendent, made only slight modifications to accommodate the new dryer system. Solids from three 500,000-gallon anaerobic digesters are run through an Edward & Jones (Veolia Water Solutions & Technologies) plate and frame press.

One cycle of solids on the press fills one semi-trailer. When the cycle is complete, the plates open and the dewatered material drops into an open-top semi-trailer. Previously, the process operated Monday through Friday, but since the dryer came online, solids are dewatered and transferred to the landfill seven days a week.

Pfeifer says the costs of the new process and land application are about the same. "The tipping fee is about the same as driving the material to Kern County," he says. "And we're facing increases in transportation costs. Once



The Ventura Regional Sanitation District (VRSD) operates a biosolids drying and renewable power generation facility at the 260-acre Toland Road Landfill in Santa Paula, Calif. (Photography by Stephen Osman)



ABOVE: VRSD solid waste division manager Greg Grant, left, and Sandy Warren, VRSD public affairs/media relations, with Ingersoll Rand microturbines that are powered by landfill methane gas. RIGHT: Grant with the system's gas compressors.



the equipment is paid for, the cost should stabilize. We expect in five years the costs will flatten out."

Chuck Rogers, superintendent at the Thousand Oaks treatment plant, appreciates having the option to take material to the dryer, but he uses that option only for backup. "My contract is different than the other treatment plants," he says. "It's nice that we have that option, but we dry as much of the solids here as we can."

After the anaerobic digesters at Thousand Oaks, solids are dewatered using two Sernagiotto belt presses (technology purchased by Siemens in 2006) and transferred to more than two acres of drying beds, where the material can reach 80 percent solids. The dried solids go to the landfill.

"We want to use the least amount of energy to produce the driest cake," Rogers says. "And when it's raining, it's nice we have somewhere else to take it."

The four plants produce the 160 tons of biosolids treated at the landfill each day. As the semi-trailers enter the facility, they back up to a receiving hopper. The front end of the trailer is raised, and the contents are dumped out the back.

"We have truckers backing up to the receiving hopper anywhere from 6 a.m. to 6 p.m.," says Grant. "The system is fairly automated, but we have to be there for unloading." The hopper contains odor-control equipment and is kept closed — it opens only to receive solids.

"Kern County didn't want the solids and Ventura County didn't want them trucked so far. We were looking for a greener, large-scale, acceptable method for handling the biosolids."

GREG GRANT

From the receiving hopper, material is transferred automatically via auger pumps to the storage hopper, which holds 300 cubic yards (eight truckloads) of material — enough to handle what might be delivered over a weekend. Even though drying takes place only during standard business hours, an operator is always on site to oversee the deliveries.

QUICK STUDIES

When the decision was made to put the biosolids facility at the landfill, operators had to get up to speed. They became quick studies in biosolids and the handling equipment. "My background is in solid waste," Grant says. "I know the solid waste management side really well, but biosolids was new. We did a lot of research and worked with vendors."

They settled on an indirect dryer manufactured by Fenton Environ-

mental Technologies Inc. The system comes skid-mounted along with landfill gas treatment, air treatment, and electric power generation. "Indirect drying is much safer than direct drying," says Grant. "With direct drying you're actually heating the air. Organic dust is explosive. Indirect drying is almost like cooking on the stove."

Thermal fluid — a paraffin-based oil — is heated to 450 degrees F, in turn heating the drying chamber, which contains a hollow-disc rotor that turns the biosolids. The process dries the solids and kills pathogens, producing a Class A material. The facility has two drying units on site, each operating at 80 tons per day. There is room for two more if an expansion is needed.

"Because you don't use hot air, there's not as much exhaust with indirect drying, only steam," Grant says. "And when you condense the steam, the particulates fall out."

MECHANICAL SYSTEM

Exhaust from the unit is run through a biofilter, a carbon filter, and a HEPA filter before discharge to the atmosphere. Condensed water removed from the exhaust is treated in a reclaimed water system, included as part of the Fenton package.

As condensate is removed from the exhaust gas, polymer is injected, and the solids are settled out. Effluent — recycled water — is stored on site and used for dust control at the landfill as needed. The amount of solids that settle out are almost negligible, and that material is hauled in slurry form to the Hills Canyon wastewater treatment plant.

Overall, the system is designed to be fully automated, but Grant stresses that it is still in the startup phase. The ultimate goal is to operate around the clock. "It's not fully automated, so if it's running, someone is watching it," says Grant.

Grant is confident that his crew is up to the task of running the drying facility because there are no biological systems to manage. "It's more of a mechanical system," Grant says. "We don't have to work with a digester or trickling filter. We keep the gas clean and the oil hot, we make sure the



The VRSD program makes beneficial use of both landfill gas and municipal biosolids.



Engineer technician David Gooding checks the gas temperature in the compressors. The gas is used to heat the oil in the biosolids dryers and to run the microturbines.

augers and pumps are feeding at the right speeds. And the burners can flame out, so we have to monitor that at the PLC or SCADA."

But that doesn't mean the operators are just sitting back and watching a screen. They collect samples at different process steps and tweak the operations. "Turbidity and coliform are tested in the recycle water to make sure the polymer and alum dosing is accurate," says Grant. "There is routine sampling of the air for odor, ammonia, sulfur, and ROC (reactive organic compounds). And there is junk in the biosolids. Sometimes we'll find a miscellaneous part, like a bow that's used to hold the tarp up on the truck."

For now, one operator is responsible for keeping an eye on the system. Usually, that's an engineer, but operators rotate through to assist and to become more familiar with the facility.

POWERED BY METHANE

Power to run the hoppers and pumps, heat the oil for the dryer, and operate all the other equipment in the drying facility comes from methane generated as waste decomposes in the landfill. The methane is collected through 75 vertical wells drilled into the waste. The wells are valved and operate in sections across the landfill.

Grant and his crew must balance the flow from the wells to ensure that the right gas-to-air ratio is pulled from the landfill and pumped to the biosolids facility. "We have to go to each wellhead and balance it about every two weeks," says Grant.

Once collected, the methane is treated to remove liquid, sulfur, and siloxanes, found in personal-care products. Then the gas is compressed and converted to electricity using nine low-emission 250 kW microturbines

JUST REWARDS

Greg Grant and others involved with the Ventura County biosolids project are proud of their accomplishments, and others have noticed, too. The biosolids management facility at the Toland Road Landfill has earned awards including:

- 2009 Project of the Year, American Public Works Association, Ventura County Chapter.
- 2009 Project of the Year, American Society of Civil Engineers, Santa Barbara/Ventura Chapter.

Grant received an Engineer of the Year Award from the American Society of Civil Engineers, Santa Barbara/Ventura Chapter.



A truck delivers a load of biosolids.

(Ingersoll Rand). About one-third of the power generated goes to the biosolids facility, and the rest is sold to the utility grid.

Once the biosolids are dried, they are conveyed by an auger pump to a dried-product receiving station. Here, solids are dropped into an open-top semi-trailer in one of three bays. Biosolids are primarily used on site for daily cover, but the county is negotiating contracts for its use as fuel or fertilizer.

UNDER COVER

Solid waste is delivered to the site at about 1,200 to 1,500 tons per day. It is placed in a daily cell, usually about 100 feet long by 50 feet wide, and 12 inches deep. Regulations require that earthen material be placed over the waste at the end of every working day to control odors, vermin, flies, and scavenging. Instead of soil, a landfill can propose an alternate daily cover.

At the Toland Road Landfill, biosolids were approved for use as daily cover, but with some caveats. "Some regulators are concerned primarily with stormwater runoff," says Grant. "So we have specific stormwater requirements in our permit that are weather-dependent." For example, if rain is expected, biosolids cannot be used as cover.

The facility also uses soil, tarps, and green waste for cover material. Biosolids make up about 10 to 20 percent of the site's cover material. "The biosolids work just fine," says Grant. "They are just supplements along with the other alternate daily covers."

Like the drying equipment itself, the dried solids have become just part of the process at the Toland Road Landfill. **tpo**

more info:

Fenton Environmental Technologies Inc.
800/521-1708
www.ifenton.com

Ingersoll Rand
704/655-4000
www.ingersollrandproducts.com

Siemens Water Technologies
866/926-8420
www.water.siemens.com

Veolia Water Solutions & Technologies
919/677-8310
www.veoliawaterst.com

In the Pipeline

WEFTEC 2010 WAS A GREAT PLACE FOR OPERATORS TO SEE NEW EQUIPMENT THEY MIGHT BE RUNNING ONE DAY SOON

By Ted J. Rulseh

The WEFTEC 2010 conference was brimming with new products and technologies, most of which will soon make their way into wastewater treatment plants and collection systems and come under the watchful eyes of *TPO* readers.

The sheer volume of innovation was impressive: The show (Oct. 4-6)

encompassed 293,000 square feet at the New Orleans Morial Convention Center, and there were 975 exhibiting companies.

It would be impossible in just a few pages to capture it all, but here are a few of the highlights observed in a three-day visit.

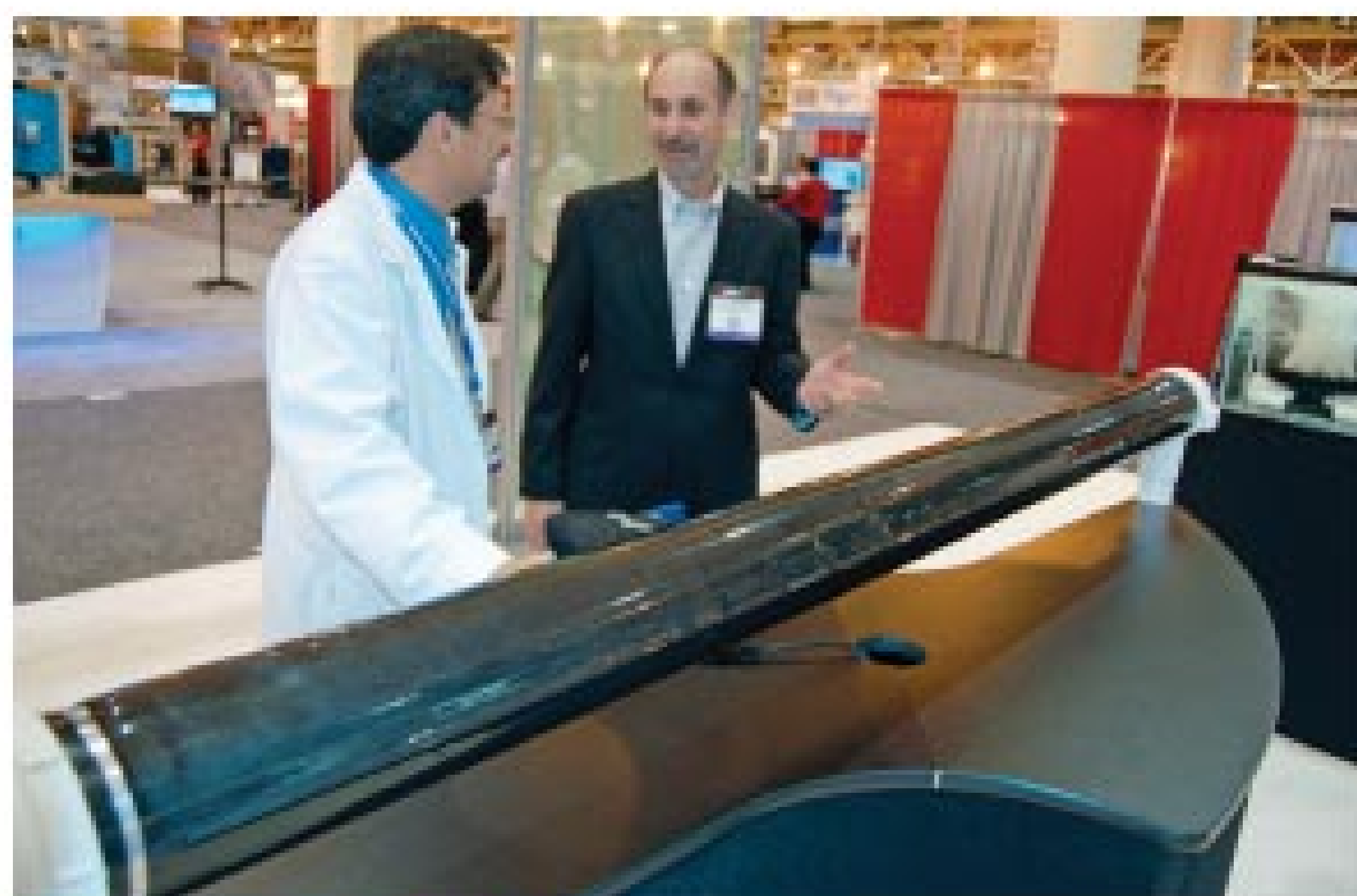


NEW MIXING CONCEPT. ABS says the EffeX submersible mixer is the first such device to use a permanent magnet motor, offering optimal life cycle economy. The mixers include a variable-speed drive, allowing processes to be optimized and energy saved. Applications include equalization basins, selector tanks, biological processes, and sludge conditioning tanks. **203/238-7000; www.ABSEffeX.com.**

SIMPLER ASSET MANAGEMENT. VUEWorks introduced the 2010 version of its asset management system with configurable dashboard, streamlined user interface, and expanded offerings for budget forecasting and condition monitoring. **603/228-8100; www.VUEWorks.com.**



BEST OF TWO WORLDS. The Delta Hybrid rotary lobe compressor from Aerzen USA Corp. uses synergy between rotary lobe blower and screw compressor technologies. Its benefits include high energy efficiency, durability, low noise, space savings, expanded operating range, and increased pressure range. **610/380-0244; www.aerzenusa.com.**



FLEXIBLE DIFFUSER. The FlexAir StreamLine diffuser from Environmental Dynamics Inc. (EDI) is designed to maximize oxygen transfer efficiency and mechanical performance. It mounts directly to the basin floor and provides full solids suspension above and below the diffuser grid. **573/474-9456; www.wastewater.com.**



BIOTRICKLING MEDIA. The dual-technology EcoPure Mini odor-control system from BioAir uses the company's EcoBase structured, synthetic biotrickling filter media to eliminate H₂S and VOCs using no chemicals. Units handle airstreams from 50 to 1,000 cfm and come pre-installed on a stainless steel skid. **856/258-6969; www.bioairsolutions.com.**



EXPLORING THE DEEP. A glider autonomous underwater vehicle from Teledyne Webb Research can be used for subsurface water sampling on a regional scale. It carries a wide array of sensors and can be programmed to patrol for weeks at a time, surfacing to transmit data to shore. **858/842-2911; www.webbresearch.com.**

Big Picture Winners

At WEFTEC 2010 in New Orleans, Hach announced the winners of its See the Big Picture contest, in which wastewater treatment agencies were asked to tell what they would do with \$40,000 or \$20,000 worth of Hach equipment. Shown from left to right are Hach representatives Melissa Voronin, Monique Lanphear and Rick Sherman; Ben Carver of the \$40,000 grand prize winner Fairfield-Suisun (Calif.) Sewer District; Victor Harris of the first-runner-up \$20,000 prize winner City of Bryan, Texas; Jon Moritz of Hach; and Mark Jurica and Mike Karr of the City of Bryan. The contest was designed to help municipal treatment plants understand the benefits of increasing nutrient monitoring to enable adjustment of chemical dosing or aeration to reflect real-time situations, thus decreasing chemical and energy costs. Find out more about the contest at www.hach.com/bigpicture.



IMPELLER CHOICES. SL submersible wastewater pumps from Grundfos are designed for network pumping stations, wastewater treatment plants, and other applications. The pumps offer two types of impeller: an LV/SuperVortex impeller to allow passage of solids up to four inches, and an SL1/Channel impeller that accommodates the same size solids but is designed for large flows of raw sewage. **913/227-3400; www.grundfos.com.**



CUT SSOS. Dri-Prime backup pumps from Godwin Pumps take over in case of lift station primary power, switchgear or sewer pump failure. These automatic, self-priming pumping systems also enable routine lift station maintenance to be performed without downtime. **856/467-3636; www.godwinpumps.com.**



MIX AND MATCH. The DataStick measuring system from Thermo Scientific lets users deploy matched plug-and-play components. The system can be configured for a large list of protocols for water-quality and process-control measurements. **800/225-1480; www.thermo.com.**



DIAGNOSE IN REAL TIME. PURE Software Solutions offers live streaming video for CCTV pipe inspection. An engineer or inspector who logs in to the system can view the streaming data and communicate with the CCTV operator in real time via instant messaging. An iPhone application is available. **303/867-1414; www.epuresoft.com.**



RAPID TREATMENT. The Bio ACTIFLO CSO/SSO treatment system from Krüger/Veolia Water incorporates a biological solids contact tank to the proven ACTIFLO process to improve soluble BOD removal. ACTIFLO is a high-rate, compact process that uses microsand to enhance floc formation and act as a ballast to speed settlement. **919/677-8310; www.krugerusa.com.**



MBR MEMBRANE. The MEMBRAY TMR 090 Series submerged flat-sheet membrane module for membrane bioreactors is designed to allow easy replacement of elements. Manufacturer Toray Industries says it also has a lower module height well suited to containerized package systems. Fine-bubble diffusers reduce daily cleaning and boost oxygen dissolution efficiency. **858/218-2390; www.toraywater.com.**

(continued)



ZOOMING IN. The QuickView pole-mounted zoom survey camera system with Haloptic technology from EnviroSight is designed to support quality infrastructure assessments at low cost. The technology uses an engineered lamp/reflector combination to project a halo of light precisely aligned with the camera view, flooding pipe walls with light and lighting distant targets. **866/936-8476; www.envirosight.com.**



PUMP WITHOUT CLOGGING. The heavy-duty WEMCO Non-Clog engine-driven trailer package is part of the new WEMCO Non-Clog line from Weir Specialty Pumps, designed for municipal applications including sewage lift stations, sludge pumping, sewage bypass, dewatering, and digesters. The trailer package includes the WEMCO Prime Assist, which the company calls a major advance in priming systems. **801/359-8731; www.weirsp.com.**



YOUR NEXT CAR? The "vehicle" pictured is actually the Electric Mole, a part of the THERMO-SYSTEM active solar sludge dryer from Parkson. It automatically turns and aerates the material to increase drying performance. Ninety-five percent of the system's energy is provided by the sun. **888/424-5766; www.parkson.com.**

INTELLIGENT DO READINGS. WTW GmbH, a global supplier of electrochemical measurement equipment and part of the newly formed ITT Analytics, offers the intelligent online dissolved oxygen probe FDO 701 IQ. Fast response makes it well suited for treatment methods like sequencing batch reactors. The soft green-light technology preserves the optical membrane for precision and long life. **800/645-5999; www.wtw.com.**

LARGE-SCALE DISINFECTION. The TrojanUVSigna disinfection system from Trojan Technologies is designed for treatment plants that want to convert from chlorine to UV. It uses innovations such as the TrojanUVSolo Lamp to reduce the cost of operation and simplify operation and maintenance. **519/457-3000; www.trojanuv.com.**



GOING MOBILE. A trailer-mounted alkaline stabilization/pasteurization process from Schwing Bioset yields Class A biosolids. The system is fully enclosed to eliminate fugitive dust and odors, has a small footprint, and is easy to operate. **715/247-3433; www.schwingbioset.com. tpo**



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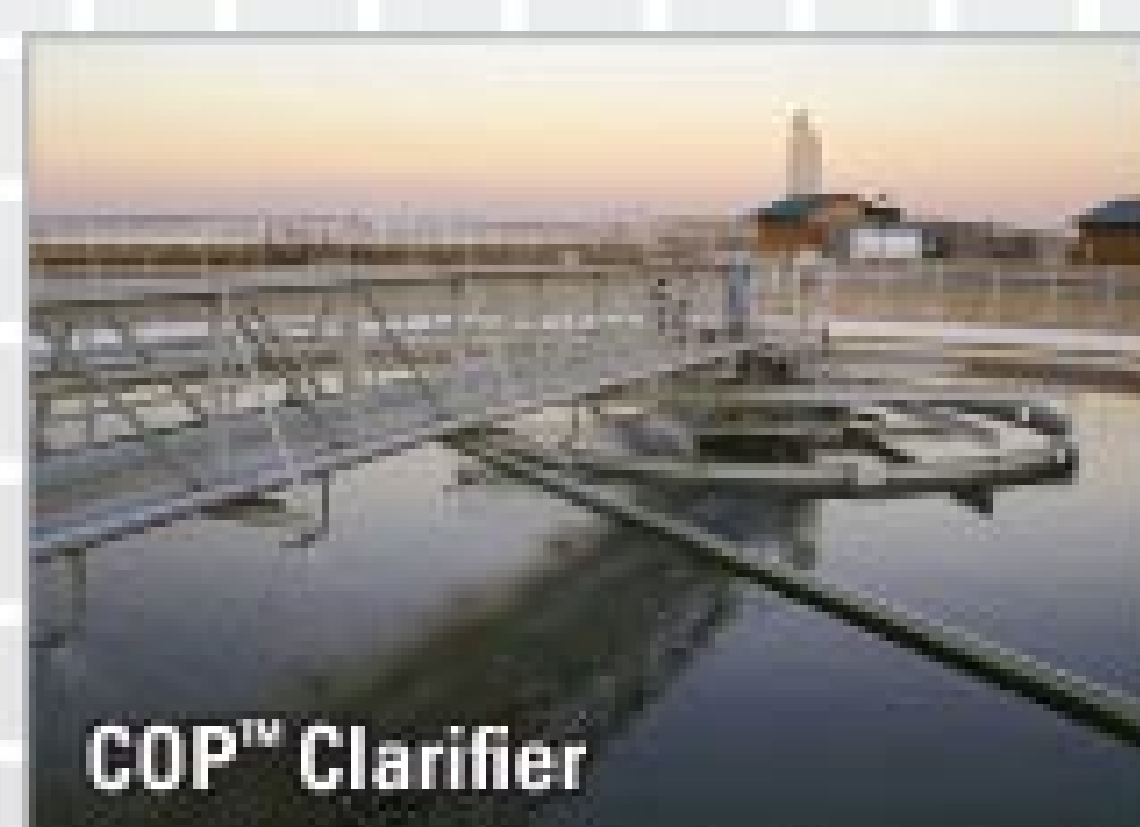
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Smooth Solution

A POLYURETHANE SPRAY COATING HELPS A TREATMENT PLANT RESTORE AN OLDER CLARIFIER, REDUCE SURFACE MAINTENANCE AND EXTEND SERVICE LIFE

By Suzan Marie Chin

During a product installation demonstration for the rehabilitation of some aging brick manholes and a concrete lift station, Mack McDonald saw what he thought might be the solution to save a deteriorating clarifier and reduce the cost of maintaining it.

The clarifier was one of two older 70-foot-diameter units at the Lancaster (S.C.) Wastewater Treatment Plant, says McDonald, public utility director. Put into service in the early 1950s, the treatment plant had seen many upgrades and changes. Today the 2.2 mgd (average) plant serves 6,000 customers in the city, 8,000 customers in the surrounding county, and three large industrial facilities.

The clarifiers were installed in 1950 and originally were equipped with all metal weirs and components. In 2000, the city replaced the rotating arm, motors and sweep arm in both clarifiers and replaced the metal weirs with fiberglass weirs.

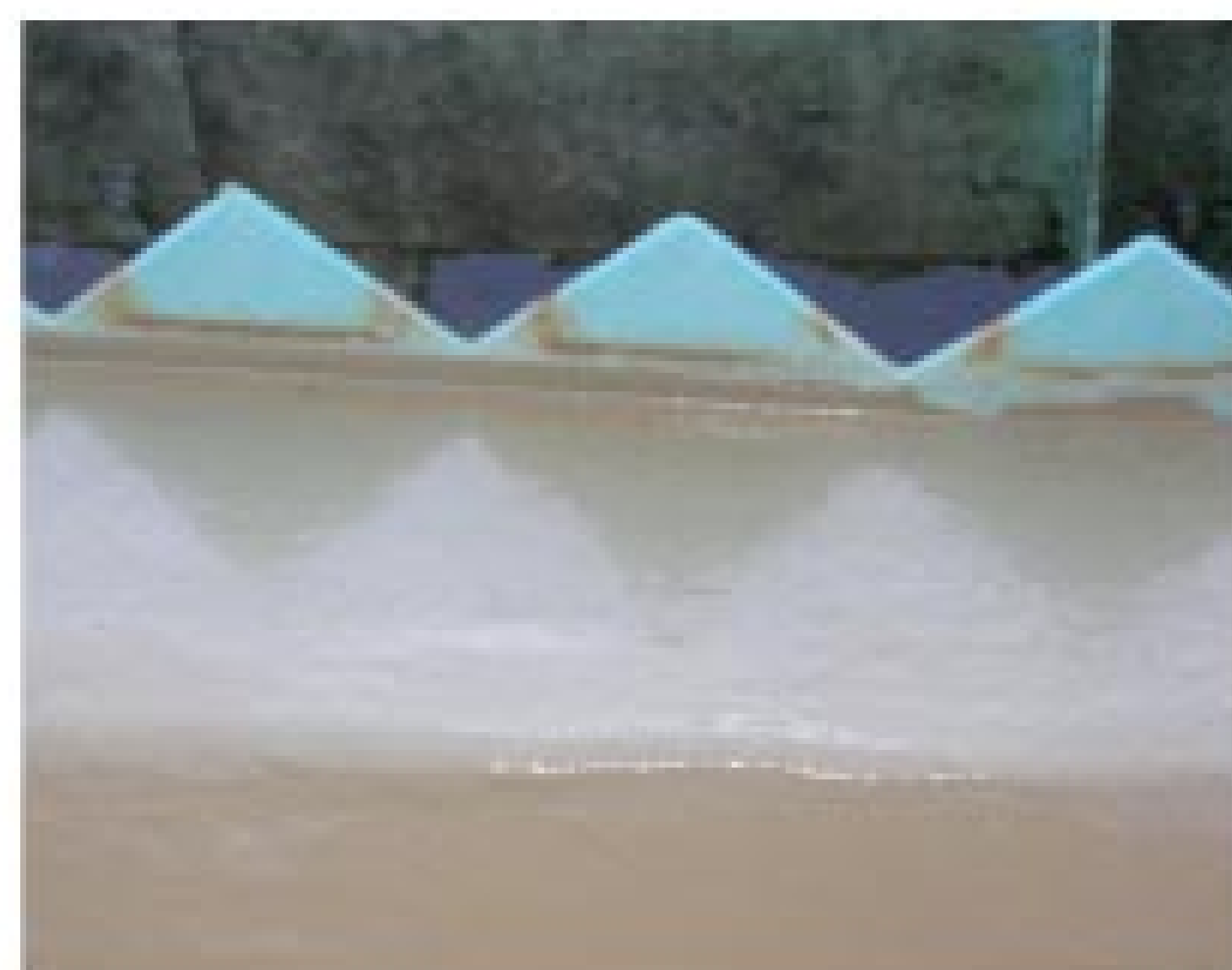
"We knew the substrate had some wear, but after we replaced the internal components, it looked so good that, in comparison, the deterioration on the concrete to which the fiberglass weir was connected started to really show its age even worse," says McDonald. Plant staff found the solution in a spray-applied polyurethane coating that secured and smoothed the surface, reduced maintenance, and extended the clarifier's life significantly.

MAINTENANCE HEADACHE

The concrete in the old clarifier was heavily pitted and had numerous voids, creating a major maintenance concern. "Anybody who knows anything about wastewater treatment knows that the solids coming in create a real good environment for algae growth," says McDonald. "With those voids in the concrete and the deterioration, algae would get hooked in those spots, and it became difficult to keep the concrete washed down and clean."



LEFT PHOTO: Weir plate "teeth" and concrete trough before repair and coating. Note the deterioration of the concrete, which hindered system performance and increased maintenance and cleaning costs. RIGHT PHOTO: The same trough after 125 mil application of SprayWall coating from Sprayroq.



PHOTOS COURTESY OF OSBORN CONTRACT SERVICES

Sprayed-on polyurethane is applied to the clarifier trough.

Share Your Idea

TPO welcomes news about interesting methods or uses of technology at your facility for future articles in the How We Do It column.

Send your ideas to editor@tpomag.com or call 877/953-3301.

To keep the algae and debris in check, crews had to wash down the clarifier twice a week, spending three hours each time. They used a fire hose because it took high pressure to free the buildup from the pitted surface. Each cleaning dislodged more loose material from the surface, making it even rougher.

While investigating solutions, McDonald looked at brushes attached to the swing arm that could scrub the surface during normal rotation, and at a spray wash process, but neither offered a long-range solution. Then he remembered that the city had used spray-applied polyurethane linings from Sprayroq Inc. to rehabilitate manholes and lift stations, and he thought the material might also solve the clarifier problem.

Osborn Contract Services, the local Sprayroq Certified Partner, suggested using SprayWall structural polyurethane coating.

If the polyurethane application was to be successful, the clarifier surface had to be completely dry and clean. That meant taking the clarifier out of service and letting it dry for at least three days. Once the clarifier was taken down, Osborn's crews began preparation.

They thoroughly cleaned the structure using a 4,000 psi pressure washer, taking care to remove all loose material and creating a solid substrate for the surface build-back. Once the surface was clean, the crew applied FX-263 rapid-set repair mortar from Fox Industries Inc. as the initial build-back material and to fill the large voids. Crews then applied up to one-half inch of Fox Industries FX-262



The clarifier trough in service before (far left) and after restoration and coating.

"We saved the concrete and got a slick finish for easy wash down, and we also extended the life of this clarifier for many more decades."

MACK McDONALD

micro silicate mortar to profile the floor and interior walls and prevent future leakage.

Maintaining the original dimensions of the trough/weir plate system was critical during the rehabilitation process. Crews took great care to maintain design tolerances. Walls were restored to maintain weir overflow rates and assure proper fall into the trough. Also, clearances for the sedimentation paddles were checked and maintained at various locations during the process. To accomplish this, they used Fox Industries FX-472, a high-build, fast-setting epoxy, on the trough walls. With this material, they could profile the walls precisely and eliminate any potential for epoxy buildup at critical transition points.

Once surface preparation was complete, the crews were ready to apply the lining. Using a plural-component gun, they sprayed on the SprayWall material at a thickness of 125 mils on the floor, interior wall and exterior wall of the trough. This thickness provided instant leak protection and the necessary structural strength and corrosion resistance.

SMOOTH AS SILK

The entire process took 10 days, and the structure was able to return to full service immediately after spray application. The change was obvious right away. The structure no longer leaks, is much easier to clean, and can be cleaned less often, says McDonald. Lancaster plans to use the same process to rehabilitate and protect other treatment structures as part of its five-year capital improvement plan.

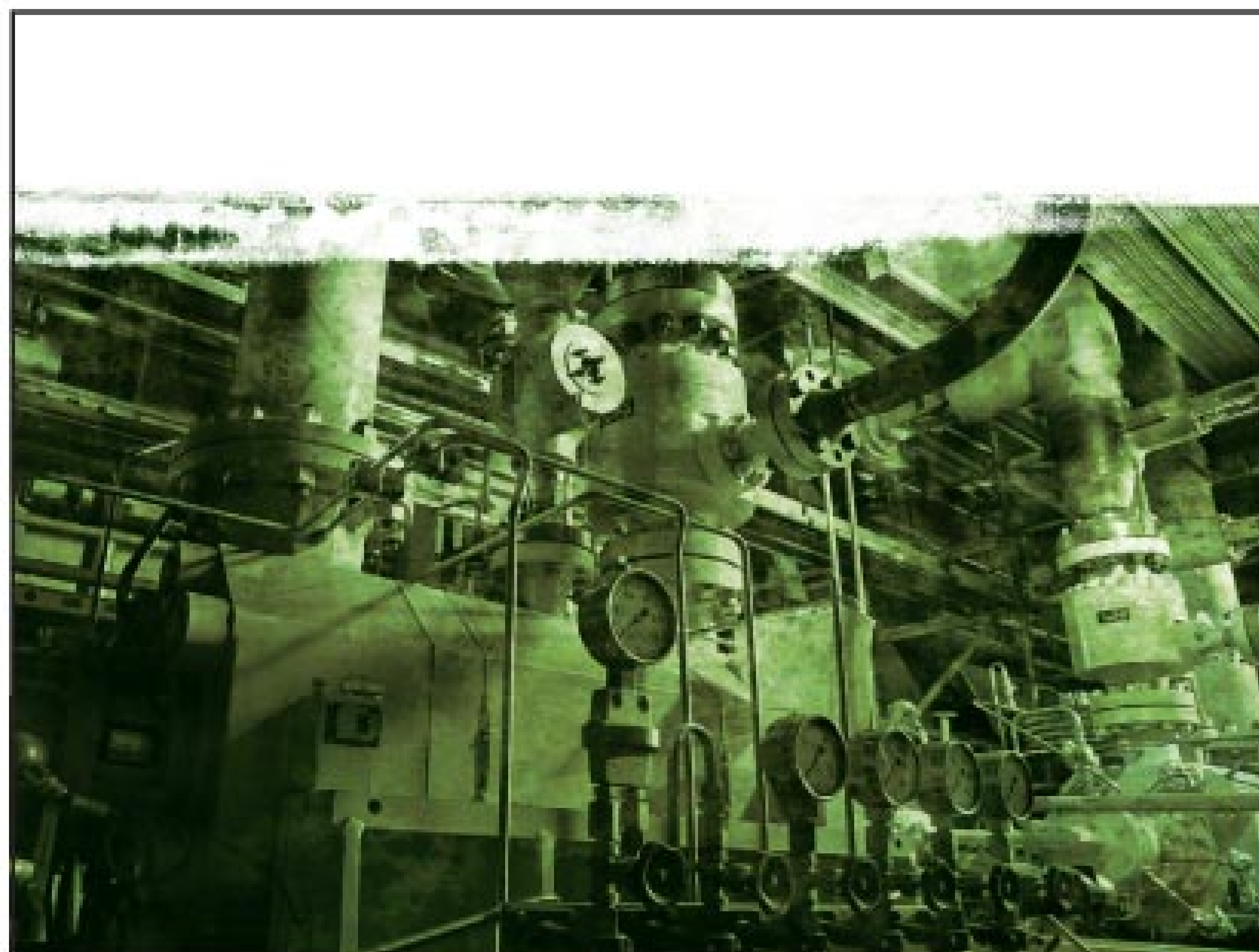
"This clarifier was a great place to test this technology, because we have another structure in a similar condition right beside it for comparison," says McDonald. "We saved the concrete and got a slick finish for easy wash down, and we also extended the life of this clarifier for many more decades." **tpo**

more info:

Fox Industries Inc.
888/760-0369
www.foxind.com

Osborn Contract Services Inc.
888/641-7888
www.osborninc.com

Sprayroq Inc.
205/957-0020
www.sprayroq.net

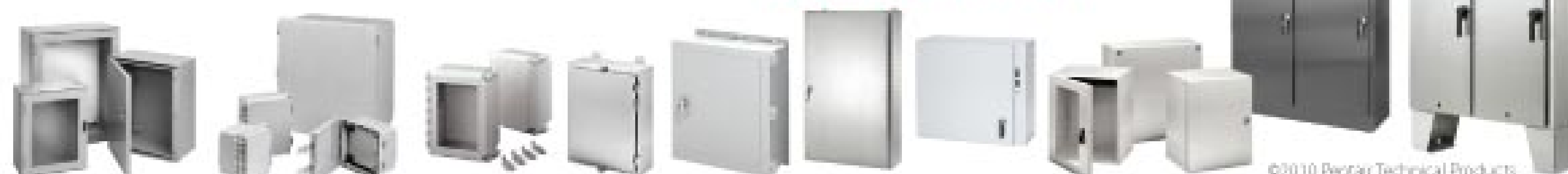


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A Little Back and Forth

BETTER COMMUNICATION BETWEEN OPERATORS AND ENGINEERS CAN MEAN MORE PEOPLE-FRIENDLY TREATMENT PLANT DESIGNS

Since the days of the original Clean Water Act, operations and maintenance personnel have struggled with problems in wastewater treatment plants caused by flaws in design. The problems include safety hazards, difficulty sampling and monitoring streams, problems getting to equipment for maintenance or repair, and more.

Most such problems can be prevented during design if operators and engineers work together. It's not just a matter of engineers coming down from their ivory towers to live in the real world. It's also a matter of plant managers, supervisors and operators going to engineers with their issues and desires early in the process of a new plant design or upgrade.

In our years on both sides of the engineer-operator divide, we have seen what operators experience, heard their opinions, learned lessons, and developed approaches that help lead to the design of efficient, flexible, operator-friendly treatment plants. Here's a look at a few kinds of problems that can be avoided if engineers and operators talk to one another.

SAFETY

Safety is the most important concern in operating a wastewater



Figure 1



Figure 2



Figure 3



treatment plant. The facility should be designed safe, yet cost-efficient. One common hazard to be avoided whenever possible is confined-space entry. Figure 1 shows a return activated sludge flow meter hidden in a vault, and later relocated above the vault for easier access.

In addition, physical hazards should be designed out where possible. Figure 2 shows trip hazards in the form of conduits in walkways, and a slip hazard where spill containment with proper drainage should have been included.

COMMUNICATION

Communication between engineers and operators enhances understanding of problems and leads to better designs. On one project, operators noticed that the digesters were achieving lower-than-normal volatile solids destruction. The engineers, acting on "textbook" information, decided to add mixers and heating to increase digestion performance. Because they looked at only a small fraction of the available data from the site, they failed to identify the true cause of the low performance.

After the "upgrade," the digesters began foaming, and the digestion complex electrical consumption increased by a factor of four, without a significant increase in performance. To handle those side



Figure 4



Figure 5



Figure 6

effects, the plant staff had to reduce the operating level and gas pressure of the digesters. The effort to solve a problem created a bigger one.

In another case, fractured communication led to a fractured structure. Figure 3 shows cracked masonry caused by direct contact between the steel support structure and the split-face cinder block. The engineers, making this modification under a change

order, failed to recognize that the problem would occur. Insight from the operations staff might have prevented the problem.

EQUIPMENT ACCESSIBILITY

A recurrent error in treatment plant design is providing inadequate access to equipment. Easy access to panels, valves, actuators and other devices is essential. Engineers and operators should discuss up front which devices need to be read, monitored, adjusted and serviced, and make sure the design leaves operators ample space to do what must be done.

Figure 4 shows exposed conduits in front of a control panel — a clear impediment to access. Another common mistake is to install valves and actuators out of reach for an average person (Figure 5).

AUTOMATIC VERSUS MANUAL

Operators also deal with problems caused by too much or too little automation. Figure 6 shows an example of too little: A bar screen that requires manual cleaning when automated systems are available. Besides being a distasteful job, manual bar screen cleaning can be dangerous during rain events when operators will be exposed to high flows and lightning.

On the other hand, automated processes are sometimes installed without a manual mode that can be easily activated in case the automation should fail.

ELIMINATING "HINDSIGHT IS 20/20"

It is important to communicate during all phases of design, especially during the preliminary stage. Proper planning empowers engineers to design structures with an overall perspective of the system operation. In addition, when operators understand the scope of work, engineers are better able to prioritize needs versus wants and

avoid missing critical design elements.

Figure 7 shows the lack of a drain in a chlorination basin. The absence of a drain requires the plant staff to spend many man-hours and move many truckloads in cleaning this basin.

PUTTING VALUE TO WORK

Operators know everything written in the plant log and on the computer monitoring screens. Most important, they know their plant in ways an engineer never can. Their experience, gained from working around the clock, can help engineers minimize failures and hold down costs. Before that can happen, operators must be empowered to express opinions and suggestions in all stages of treatment plant

Operators know everything written in the plant log and on the computer monitoring screens. Most important, they know their plant in ways an engineer never can. Their experience, gained from working around the clock, can help engineers minimize failures and hold down costs.

design and construction — and must take the initiative to do so. Keys to better treatment plant designs include:

- Fostering clear communication between operators and engineers.
- Trusting operators' experience and knowledge.
- Identifying problems early and solving them collaboratively.
- Confirming the plant layout and making sure designers understand plant operations.
- Using three-dimensional drawings to identify conflicts.
- Using common sense when locating equipment.
- Including all maintenance crafts during the early phases of design review.
- Researching site-specific issues before trying to solve problems.
- Determining the optimum level of equipment automation and providing manual backup modes that are easy to deploy.

ABOUT THE AUTHORS

Contributors to this article are Ana Julia Pena-Tijerina, project engineer, Carollo Engineers; Raymond Perez, Jr., and Roberto Macias, plant managers, San Antonio Water System; Sterling Lee, plant superintendent, San Antonio River Authority; Rajendra P. Bhattarai, manager, Environmental and Regulatory Services Division, City of Austin; and Orren West, Jr., division manager, wastewater treatment plants, City of Austin. tpo



Figure 7



Bringing the Message Home

A MINNESOTA GROUP DEVELOPS ITS OWN EDUCATIONAL PROGRAM ON THE IMPORTANCE OF MAINTAINING WATER AND WASTEWATER INFRASTRUCTURE

By Ted J. Rulseh

The 2009 TV documentary, "Liquid Assets: The Story of Our Water Infrastructure," sent a powerful message about the importance of water and wastewater infrastructure.

Now, a group in Minnesota hopes to personalize that message with a documentary for state residents. "Blueprint Minnesota: Liquid Assets" (www.BlueprintMN.com) is a grassroots initiative seeking to create a 30-minute public TV program that builds awareness about the critical role water infrastructure plays in protecting public health and promoting economic prosperity in the "Land of 10,000 Lakes."

Like the national "Liquid Assets" program, produced by Penn State Public Television and supported by major water, wastewater and other industry associations, the Minnesota program is a major team effort.

Among the leading instigators was Andrew Sullivan, a utility operator with the City of Eden Prairie, a southwest suburb of Minneapolis. Inspired mainly by the national "Liquid Assets" program, he helped pull together a group of organizations that deal with infrastructure (see sidebar) to begin discussion of a state-based program.

"I'm in a position where I deal directly with customers. I'm in their homes, hovering over their meters while they look over my shoulder. I talk to them about how the water enters the house and how it leaves the house. I used to think people didn't care, but man, they are very interested."

ANDREW SULLIVAN

As of early October, the project was advancing largely on schedule. Sullivan and the team plan to cover topics such as the necessity and value of water infrastructure and the hazards of continued neglect; the watershed protection approach to building and sustaining infrastructure; the engineering challenge of building and maintaining water distribution, collection and treatment systems; modern rehabilitation solutions; and the financial and political challenges of getting vital infrastructure work done.

Sullivan expects the finished documentary to be ready for public viewing in summer or fall of 2011. He talked about the project in an interview with *Treatment Plant Operator* magazine.

tpo: Why did you become so interested in this project?

Sullivan: I'm one of 12 people who take care of the water, storm and sanitary sewer systems in Eden Prairie. It's a great place to work. We have some very proactive leaders when it comes to infrastructure. We have goals, and we're held accountable.

I've been in this profession for about 20 years. I'm a guy who wears a hardhat and gloves, but I also really enjoy interacting with the public and contributing back to the industry that has given so much to me.

tpo: What led to the idea for a program on Minnesota's infrastructure?

Sullivan: Our water and wastewater organizations here have often talked about what could happen if we all combined our efforts to build awareness about critical water infrastructure. For one thing, it's a way to combat what I call our competitors — the cable, gas, electric and phone companies.

They have \$20 million advertising budgets. We use our budgets to make sure the infrastructure works, that people get clean water, and that their wastes are collected and treated without incident. It made sense for us to get together and combine our knowledge, resources and reach and go at this.

What helped kick it off was seeing the "Liquid Assets" program created by Penn State. Those guys knocked it out of the park. Their program is about an hour long, and it's fantastic. So we started lobbying Twin Cities Public Television, because we thought that was something the public should see more of.

They said they liked the "Liquid Assets" program, too. They ran it once, and then they said, "Why not a Minnesota version?" So we invited our infrastructure leaders to a meeting. They all showed up and said, "Heck yeah, let's give it a go."

tpo: What is the state of Minnesota's infrastructure today?

Sullivan: According to the American Society of Civil Engineers' Report Card for America's Infrastructure, our state's water systems



Andrew Sullivan

need investments of \$5.46 billion over the next 20 years, and the wastewater systems need \$2.73 billion in the same time period.

Minnesota is known as the "Land of 10,000 Lakes," but it's really the land of more than 12,000 lakes, the freshwater sea we call Lake Superior, 10.6 million acres of wetlands, the headwaters of the Mississippi River, and 69,200 miles of natural rivers and streams. We take our water pretty seriously here, and our critical water infrastructure plays a role in that.

tpo: Do you think the public is truly interested in infrastructure?

Sullivan: Definitely. I'm in a position where I deal directly with customers. I'm in their homes, hovering over their meters while they look over my shoulder. I talk to them about how the water enters the house and how it leaves the house. I used to think people didn't care, but man, they are very interested.

They'll watch me dig holes in the yard and find the curb stops, and if I'm opening up a manhole, they're peering in and asking where the water goes. Contrary to popular belief, I think people are fascinated by how things work.

tpo: How much of an in-depth look do you plan to take in this program?

Sullivan: We'd like to give the folks a quick overview of everything, from the treatment plants, to the piping and manholes and pumps. We'll talk about the important role infrastructure plays in health, the environment and the economy, what it takes to keep infrastructure working, and the repercussions of not taking the proactive approach that Minnesota is known for.

The organizations working on this project definitely have a vision for what things should look like in the 21st century, and it will be nice to share that with the public. We looked around at some other states that have had problems, and we realized we can't let that happen here. Right now, we are at a crossroads where you ask yourself: Do you love infrastructure or do you leave it? Embrace it or ignore it?

tpo: Are you optimistic about the future of Minnesota's infrastructure?

Sullivan: Yes. We're fortunate today to have GIS and GPS technology. It helps us answer the three most important questions in infrastructure: What do I have? Where is it? What is its condition? Now we can pull out laptops in our trucks and see all that, so when it's time for budgeting, we can see what we have in the ground, and what work needs to be done, and budget that in.

We're also lucky to have trenchless technologies that often let us do work at a fraction of the cost compared to the old days. So we're optimistic about what we can do, but we have to get the public behind us, too.

tpo: How and when did work on this project actually begin?

Sullivan: It began in spring of 2009. I got on the phone and got all the groups on board. We held our first meeting shortly after and it really got rolling by fall. Once Twin Cities Public Television said they were willing to partner with us, it wasn't hard to talk anyone into getting involved.

tpo: What basic approach are you taking to this documentary program?

Sullivan: We've asked all the partners to come up with examples of failures and successes. We don't want to get too "doomsday," but it needs to be about real problems, real solutions, and real people.

For filming, we're going to do something very interesting. Twin Cities Public Television held a seminar to train some of our people to

use basic handheld video cameras that are compatible with their editing environment. People in our profession will use those cameras to film many of the segments. We can certainly get access to sites more readily than a TV crew could, since we work around the infrastructure every day. We're doing the shooting with the handheld cameras now.

We put out an all-call, and we got a terrific response from people wanting to help. We have some very passionate people out on the front lines who are not afraid of the video technology. Meanwhile, Public TV people will shoot the interviews with experts.

"This is certainly a shot in the arm for the people out there making infrastructure function every day. In general, the only time they are seen and heard of is when infrastructure fails. That's no way for the public to get to know their infrastructure, and no way for us to get to know the public."

ANDREW SULLIVAN

tpo: What sort of funding does it take to create a program like this?

Sullivan: Our goal is to raise \$30,000, and to date (early October) we have raised \$19,500. The handheld cameras are going to save us considerable time and money as well. We're glad Twin Cities Public Television was able to work with their unions to allow us to do that. Of course, Public TV, as one of our partners, is contributing substantially to the production.

tpo: Besides raising awareness of the infrastructure itself, do you see this program raising the profile of the people who take care of it?

Sullivan: This is certainly a shot in the arm for the people out there making infrastructure function every day. In general, the only

WHO'S BEHIND THE BLUEPRINT?

The Blueprint Minnesota: Liquid Assets group has a diverse group of sponsors and partner organizations with interests in healthy water and wastewater infrastructure. They include:

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- Twin Cities Public Television (partner)

time they are seen and heard of is when infrastructure fails. That's no way for the public to get to know their infrastructure, and no way for us to get to know the public. It'll be good for the people who take care of infrastructure to have a part in sharing this with the public. It reinforces the importance of the roles we play.

tpo: Besides putting this program on TV, how do you envision using it?

Sullivan: Our people will be able to pop in this DVD in front of a council meeting, or even have a special community get-together where residents can watch it and then deal with the tough questions: What is the condition of our infrastructure? What is it going to take to fix what we have?


We'll also design it so that it can stand alone, or we can chapter it out and play pieces of it on YouTube, and post them live on community Web sites. We're looking at airing it on local access cable. There are lots of directions we can take this.

tpo: Did your group take any lessons from the collapse of the I-35W bridge in the Twin Cities in 2007?

Sullivan: That was a wake-up call. It's scary. An analogy has been made that we have infrastructure that's just as critical right under our feet, that is older and in worse shape and can have the same if not worse consequences if it fails.

tpo: Do you see other states in the future doing something such as Minnesota is now doing with this documentary?

Sullivan: Long-term, we're hoping that will happen. Infrastructure is something people only notice when it fails, and when it does, it always seems to happen to someone else. When they see that it's their state and their community it becomes a whole different story. That's powerful stuff. **tpo**



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CREATING A JEWEL

JAMES STEWART FOLLOWED HIS MOM'S ADVICE INTO THE WASTEWATER PROFESSION. HE NOW LEADS AN AWARD-WINNING TEAM AT A TEXAS TREATMENT FACILITY.

By Trude Witham

JIM STEWART CREDITS HIS MOTHER FOR GETTING HIM started in the wastewater treatment field. His career has spanned 30 years, first in his native Colorado as a wastewater treatment operator, and now in Texas, where he supervises five operators at the 4.75 mgd (design) advanced secondary treatment Floyd Branch Wastewater Treatment Plant in the Dallas suburb of Richardson.

A recipient of the 2009 Texas Water Utilities Association (TWUA) Operator of the Year Award, Stewart recently oversaw a major upgrade of his plant, now considered a jewel of the North Texas Municipal Water District (NTMWD). He credits much of his success to an outstanding team of operators.

Stewart keeps his five-member team engaged and enthusiastic with an emphasis on training and a management style that gives team members considerable autonomy. He expects them to take responsibility for identifying and addressing treatment issues.

That leads to solid performance. The plant has earned recognition from the National Association of Clean Water Agencies that include Gold awards (no permit exceedances for a year) in 2000, 2003 and 2004, and Silver awards (two or fewer exceedances) in 2002 and 2005-2007.

MOTHER'S INFLUENCE

"My mom was an office manager for a small water district in Colorado," says Stewart. "She said if you want a secure job, go into the water treatment field."



Plant supervisor Jim Stewart and his team at the Floyd Branch Wastewater Treatment Plant turned an older facility into a top performer that is considered a jewel of the North Texas Municipal Water District system. (Photography by Ross Skeegan)


When he graduated from the University of Southern Colorado with a degree in industrial arts, his mother encouraged him to go to school for his wastewater certification. He attended a night class in Canon City, Colo., and also learned about the wastewater treatment process by studying with the operators at the wastewater plant in the district where his mother worked.

After obtaining his entry-level certification in wastewater treatment, he started his career as an operator at a small plant called Widefield Water and Sanitation near Colorado Springs, where he found a mentor in lab technician Larry Bishop.

"Larry took me under his wing and taught me the ropes," says Stewart. "You always have that one person who makes a difference in your life. I still use what he taught me — that the accuracy of your sampling is the most important thing. Was it taken in the right place? Was the test run properly? That affects how you run your plant."

Bishop taught him to use his senses — sight, smell and hearing — when walking around the plant. He told him that if something doesn't look, smell or sound right, then something is wrong.

Stewart moved to Texas in 2000 because he needed a change. He started at the North Texas district as a wastewater operator at the Wilson Creek Wastewater Treatment Plant, and was then promoted to coordinator. When one of the Floyd Branch supervisors retired, the district brought Stewart in to run that plant. He became plant supervisor after three months.



Jim Stewart switches a sand filter from Aqua-Aerobic Systems into the manual mode. The Floyd Branch plant benefited from a major upgrade in 2008.

profile



**Jim Stewart,
Floyd Branch Wastewater Treatment Plant,
North Texas Municipal Water District**

POSITION:	Plant supervisor
EXPERIENCE:	30 years
EDUCATION:	University of Southern Colorado (industrial arts degree); average of 10 CEUs in wastewater per year for the past 10 years
CERTIFICATION:	Texas Class A and Colorado Class A, wastewater operations
MEMBERSHIP:	Texas Water Utilities Association
GOALS:	Make the plant more energy efficient

"You have to get out there every few hours and listen and look. My operators can always find a problem and can hear a part starting to seize up."

JIM STEWART

"My advice for other supervisors is: Don't ask your employees to do anything you wouldn't do yourself. Always treat them with respect."

JIM STEWART

RIGHT PHOTO: The Floyd Branch treatment plant team includes, from left, chief operator Allen Gooch, operator II Curtis Smith, operator trainee Tony Raines, operator I Mauricio Lazalde, and plant supervisor Jim Stewart. Not pictured is operator II Noe Guzman. **LOWER PHOTO:** Stewart and Gooch check the quality of biosolids at the Charter Machine gravity belt thickener.



OVERSEEING AN UPGRADE

The Floyd Branch plant is one of 18 plants in the district. It was built in 1954 as a trickling filter plant and upgraded in 1963. In 1986, the district built a separate activated sludge plant, and the two plants operated side-by-side, with a combined flow but one permit and a single outfall.

"We referred to the two plants as the 'old side' and the 'new side,' and we combined the two flows because of permit constraints," Stewart says. "The flow from the old plant combines with the new plant before the flow goes to the sand filters."

In 2008, the district completely upgraded the activated sludge plant and kept the trickling filter plant mainly as a backup (it now processes about 15 percent of the flow). "Not only was it an old plant, but we wanted to improve aeration treatment for better ammonia removal and for plant safety," Stewart says. "I was happy to contribute to the design by offering my input on what equipment I preferred and what equipment I didn't think would serve our purpose."

The upgrade included a primary clarifier launder cover and Calgon Carbon filter foul-air scrubber. Environmental Dynamics Inc. (EDI) fine-bubble aeration with plug flow replaced a coarse-bubble aeration system for better ammonia removal and to meet future ammonia limits, in case they become stricter.

A WesTech secondary clarifier was added as a backup to the existing unit, and a new solids dewatering building was constructed with a Siemens dual-media chemical scrubber odor-control system. The project also included an

LET THEM DO THEIR JOB

The operators under Jim Stewart's supervision at the Floyd Branch Wastewater Treatment Plant love their work, and part of the reason is Stewart's belief in training and the supervisory skills he has built.

"I do a lot of training, reviewing material in books and preparing them for certification tests," Stewart says. "I've taught them to where if they see mixed liquor getting too light and solids building up, they can fix it instead of calling me up and asking if they can do this. That is how they learn. And if they make a mistake, they make a mistake. I won't chastise them. I have learned this from my managers."

Stewart encourages operators to use their senses to detect problems with the plant, just as his mentor, Larry Bishop, taught him years ago. "This is not just busy work," he says. "You have to get out there every few hours and listen and look. My operators can always find a problem and can hear a part starting to seize up."

Allen-Bradley (Rockwell Automation) motor control center power transmission system with switchgear and a generator switchover system.

ADVANCED PROCESS

All flow enters the plant through two outfall lines (15 and 24 inches) and passes through a Lakeside Equipment Corp. fine-screen bar screen before entering the wet wells of the influent pump station.

The flow is then split into two treatment trains of 2.25 mgd and 2.5 mgd capacity. The 2.5 mgd train consists of three Clarigesters (a clarifier with a Dorr-Oliver [Ovivo] digester underneath), two trickling filters, and a final clarifier.

The 2.25 mgd train has a primary clarifier, two parallel aeration basins and two secondary clarifiers. The solids are dewatered with a Charter Machine 1.2-meter gravity belt thickener and a 1.0-meter Ashbrook Simon-Hartley belt filter press.

The screened influent to the 2.25 mgd train is pumped to a primary clarifier. From there, the wastewater gravity flows to two parallel plug-flow aeration basins. The mixed liquor from the aeration basins flows equally to the two secondary clarifiers.

Floyd Branch Wastewater Treatment Plant PERMIT AND PERFORMANCE

	INFLUENT	PERMIT (daily avg.)	EFFLUENT (6-month avg.)
TSS	147.7 mg/l	15 mg/l	1.68 mg/l
CBOD	171.8 mg/l	10 mg/l	2.6 mg/l
Ammonia Nitrogen	17.1 mg/l	2.0 mg/l March-Nov. 4.0 mg/l Dec.-Feb.	0.16 mg/l

Effluent from the secondary clarifiers re-combines and flows equally through two automatic backwash traveling bridge dual-media filters. Chlorine solution is fed ahead of the filters for disinfection and algae control.

The flow then passes through two chlorine contact basins for disinfection and is dechlorinated before discharge to the Floyd Branch tributary of Cottonwood Creek, which flows to White Rock Creek and ultimately to White Rock Lake in the Trinity River Basin. The plant has a non-potable reuse system for irrigation and plant water.

SUBSTANTIAL IMPROVEMENT

Completed in mid-2009, the upgrade has greatly improved effluent quality. "When we started this in 2008, my objective was to make this the best plant in our district, and I feel we have achieved that," says Stewart. "We did everything right."

The plant's June 2010 water quality report showed removal rates of 99.6 percent for TSS, 99 percent for CBOD and 99 percent for ammonia nitrogen. The plant's six-month average before the upgrade began was 96.6 percent TSS removal, 97.5 percent CBOD removal, and 95.4 percent ammonia-nitrogen removal.

"Our contact chamber is 15 feet deep," says Stewart. "You could drop a quarter in there and see it at the bottom — that's how clean the water is now."

Stewart takes great pride in his plant's achievements. "I look at this as a competitive thing. With those removal rates, we were top dog compared with the other plants. We're one of the smaller plants, but we're up there with the big guys."

"I was happy to contribute to the design by offering my input on what equipment I preferred and what equipment I didn't think would serve our purpose."

JIM STEWART

The plant has a small lab for daily tests such as oxygen, pH and settleables. Major tests, such as TSS, CBOD and ammonia, are done at the district's main lab in Wylie. Although the district has a maintenance department, the operators at the Floyd plant try to do whatever maintenance they can. They also keep up with the yard work on the plant's five acres, mowing, trimming weeds and planting flowers.

A GREAT TEAM

Stewart credits his operators with keeping the plant in great shape and the effluent quality high. "I never have to worry about personnel issues," he says. "One of my operators said he used to hate coming to work, but that since I took over, he loves coming to work because I make the job interesting. I have another operator who has been with us for six years, and he says this is the best job he ever had. He motivates the other guys."

Allen Gooch, chief plant operator, has been in wastewater for 34 years and with the district for 23. He holds a double Class B license in water and wastewater. Curtis Smith, operator II and maintenance planner, has 30 years in wastewater, and 23 with the district. He holds a Class C wastewater license.

Noe Guzman, operator II, has been with the district for five years and holds a Class C wastewater license. Mauricio Lazalde, operator I, has been

in wastewater for three years, two with the district. He holds a Class D wastewater license. Anthony Raines, operator trainee, has been with the district for four years.

MULTIPLE AWARDS

Stewart's supervisory talents and the plant's high-quality effluent have earned recognition. Besides the 2009 TWUA award for plants in communities with 30,000-60,000 population, Stewart was nominated for the district's 2005 Carl Riehn Employee of the Year Award. He has been nominated every year since.

"The nominations are made to a committee in the district, and it's a large district with over 600 employees," he says. "So, just to be nominated is an honor."

Stewart says the plant will stay small: Except for plans to add UV disinfection and a security and surveillance system, there are no immediate plans to expand. "We're a gravity-feed operation with no lift station, and unless we need to start treating more wastewater, we don't need to upgrade," he says.

The plant treats mostly residential wastewater, and the biggest challenge is getting enough bacteria. "Sometimes my influent TSS is under 100, and I am begging for someone to send me some bugs," Stewart says. "And that's when you really have to watch what you're doing with the treatment process."

Stewart would like the plant to become more energy efficient. The district has looked at cogeneration with digester methane, and at adding solar panels or a wind generator. He would also like to add a digester, rather than just process the sludge to send to the landfill.

"We are using non-potable water to blend with our dewatering polymer, and we also irrigate our site so that it looks like a park," Stewart says. "But we would like to do even more to save energy and become more environmentally conscious."

In the meantime, Stewart will continue to do what he does best: motivate his operators to do their greatest work. "My advice for other supervisors is: Don't ask your employees to do anything you wouldn't do yourself. Always treat them with respect." **tpn**

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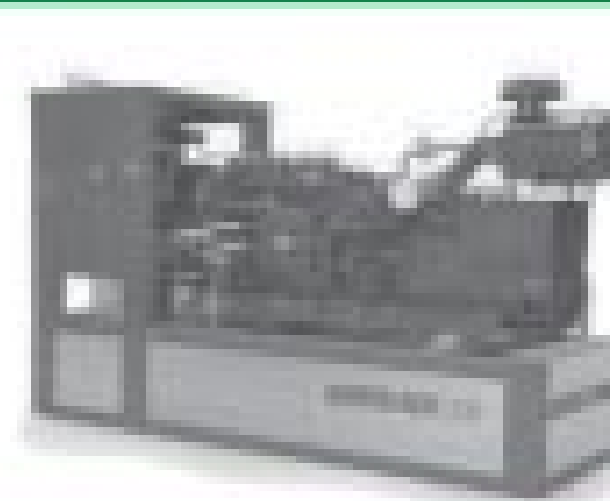
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KSB Group Acquires Standard Alloys

German pump manufacturer KSB Group has acquired Standard Alloys of Port Arthur, Texas, a specialist in pump repair, component machining, assembly and engineering.

Godwin Pumps Names Ohstrom VP of Marketing

Godwin Pumps has named Per Ohstrom vice president of worldwide marketing and business development. He will be based at the company's headquarters in Bridgeport, N.J. Ohstrom has a Bachelor of Science degree from Lulea University of Technology in Sweden and a Master of Business Administration from Northwestern University.



Per Ohstrom

Assmann Receives ISO 9001:2008 Certification

Assmann Corporation of America, manufacturer of large polyethylene storage tanks and plastic storage containers, has received ISO 9001:2008 certification of its management system. The company has manufacturing facilities in Garrett, Ind., and Marshall, Texas.

Cummins Power Generation Earns OSHPD Preapproval

Cummins Power Generation's high-range generator sets have received seismic certification preapproval by OSHPD, California's Office of Statewide Health Planning and Development. The generator preapproval covers configurations with a generator set only, generator and sub-base fuel tank and generator with fuel tank and enclosure.

Water Environment Federation Launches Web Site

The Water Environment Federation (WEF) has launched a National Biosolids Partnership Web site, www.biosolids.org. The site provides information on all aspects of biosolids management, including NBP's EMS-based certification program.

JWC Introduces Prevention and Inspection Plan

The JWC Environmental Monster Prevention & Inspection plan is an on-site service plan to ensure peak performance from JWC's family of wastewater products. The plan includes complete system inspections, including mechanical and electrical systems, and adjustments of controllers, sensors, cycle, spray wash, flow meters, level detectors, chains, brushes and more.

Hach Lists 'BIG Picture Contest' Finalists

The 12 municipal wastewater treatment facilities named fan favorite finalists in Hach Co.'s "See the BIG Picture" contest are City of Bryan, Texas; City of Cordele, Ga.; City of Hutchinson, Minn.; Cranberry Township Brush Creek, Pa.; Destin Water Users, Fla.; Fairfield-Suisun, Calif.; Milan, Tenn.; Nazareth Borough Municipal Authority, Pa.; South Adams County, Colo.; Town Branch, Ky.; Village of Essex Junction, Vt.; and Village of Lake Placid, N.Y. The contest is designed to help municipal wastewater treatment plants understand the benefits of increasing nutrient monitoring, including lower chemical and energy costs. First prize in the fan favorite contest is \$20,000. In addition, Hach will award \$60,000 in equipment to grand prize recipients and the first runner-up. **tpo**

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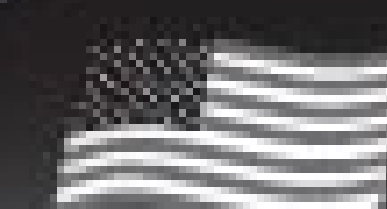
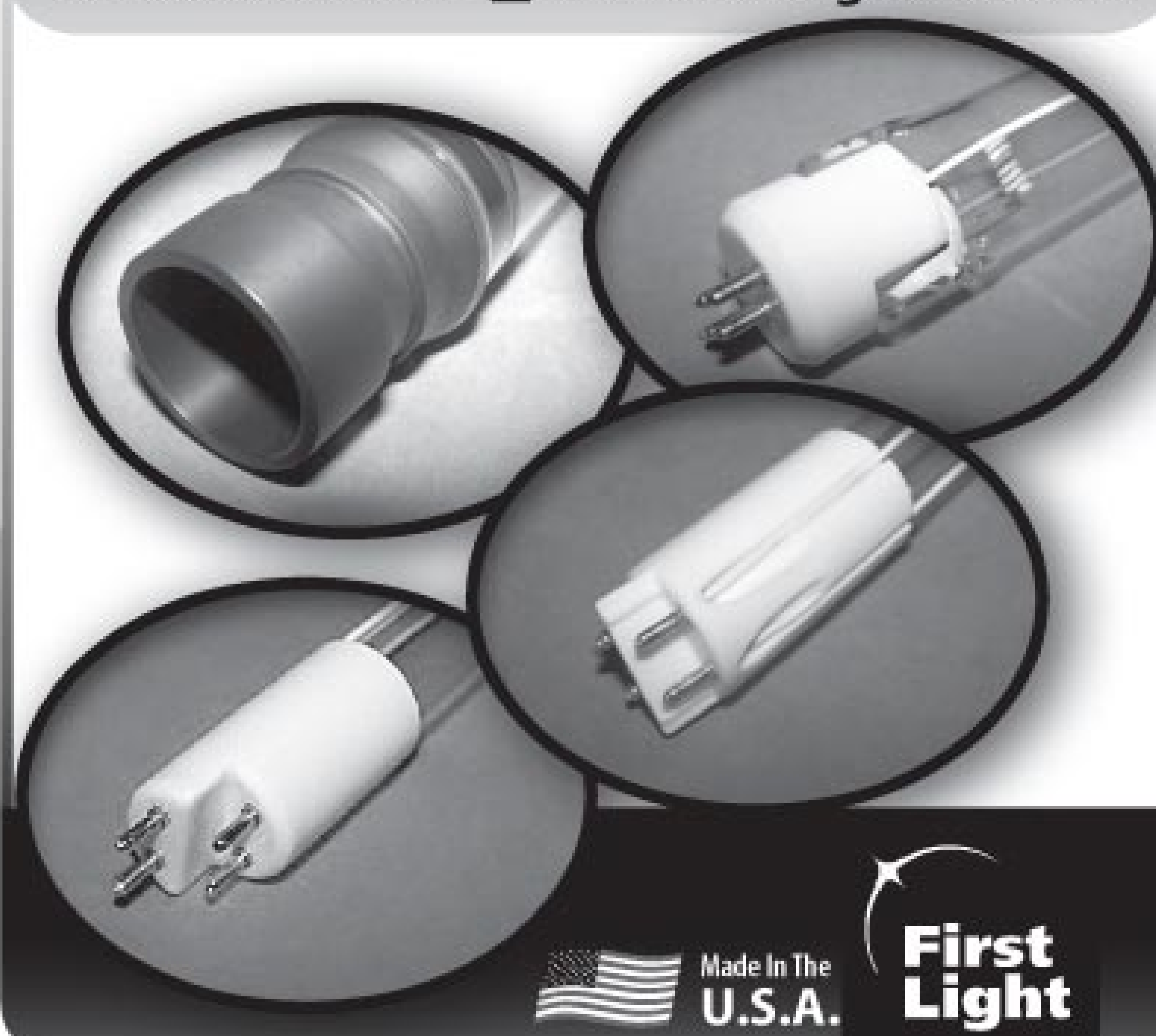
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NAWT

National Association of Wastewater Transporters

- 8 a.m. So You Think You Want to Own a Waste Treatment Facility?
- 9:30 a.m. Grease as a Resource
- 11 a.m. Resource Recovery - Methane and Septage
- 1 p.m. O & M Problems on Drip Distribution Systems
- 2:30 p.m. O & M Problems We Have Seen
- 4 p.m. O & M Problems with Media Filters

NASSCO

National Association of Sewer Service Companies

- 8 a.m. Grout: Its Use and Application for the Total Collection System
- 9:30 a.m. Cured-In-Place Pipe
- 11 a.m. Pipe Bursting Tools for Everyday Utility Installations
- 1 p.m. How Will You Know if You Need to do a Sewer System Evaluation Survey (SSES)?
- 2:30 p.m. Laser Profiling Applications for Documenting Piping System Conditions
- 4 p.m. Advancements in UV Technology for Curing CIPP

WJTA

WaterJet Technology Association

- 8 a.m. Estimating the Vacuum Job for Fun and Profit
- 9:30 a.m. How to Maximize the Power of Your Waterjetter
- 11 a.m. Waterjetting - Financial Startup Considerations and Real-World Application

PSAI

Portable Sanitation Association International

- 1 p.m. Understanding Your True Cost per Service for Special Events - Part 1
- 2:30 p.m. Understanding Your True Cost per Service for Special Events - Part 2

NARC

National Association of Regulated Carriers

- 4 p.m. Avoiding Violation Fines and Tickets with DOT Safety Compliance

NOWRA

National Onsite Wastewater Recycling Association

- 8 a.m. Troubleshooting Our Modern Waste Stream
- 9:30 a.m. Pumps - A Basic Understanding
- 11 a.m. System Remediation - Why, What, When, Where and How?
- 1 p.m. Selling the System to Site Conditions
- 2:30 p.m. Sampling Sewage Treatment Systems
- 4 p.m. Effluent Dispersal and Water Management

NEHA

National Environmental Health Association

- 8 a.m. The Qualified O & M Service Provider
- 9:30 a.m. Effluent Screens and Filters for Onsite Applications
- 11 a.m. Develop Champions for Your Decentralized Wastewater Projects
- 1 p.m. The Business of Management
- 2:30 p.m. Developing O & M Inspection Actions
- 4 p.m. Working with Regulators, Regulations & Industry

SCOTT HUNTER

Business Track

- 8 a.m. Creating an Extraordinary Organization - The Mindset of Leadership (Part 1)
- 9:30 a.m. The Mindset of Leadership (Part 2)
- 11 a.m. The Mindset of Leadership (Part 3)
- 2:30 p.m. Creating an Outrageously Successful Organization (Part 1)
- 4 p.m. Creating an Outrageously Successful Organization (Part 2)

LRN

Leaders Resource Network

- 8 a.m. The Disciplines and Art of Business Success
- 10 a.m. Developing a "Fantastic" Team
- 1 p.m. Diversifying or Specializing Your Services
- 3 p.m. Succession Planning

DETAILED SESSION INFORMATION AVAILABLE AT:

WWW.PUMPERSHOW.COM



THURSDAY SESSIONS

March 3, 2011

BUSINESS TRACK

- 8 a.m. 45 Marketing Tips in 45 Minutes
Lenzyme Inc. - Jerard Nighorn
- 9:30 a.m. The Benefits of Vehicle Routing Software in Today's Economy
RouteOptix Inc. - Ron Davey
- 11 a.m. Unleashing the Power to Profit and Freedom
Nexstar Inc. - Kenny Chapman

LIQUID WASTE TRACK

- 8 a.m. The Evolution of Effluent Filters
Bear Onsite LLC - Theo Terry
- 9:30 a.m. "Life Cycle" From Waste to Windfall
Big Fish Environmental - John Campbell
- 11 a.m. Take Confined Space Seriously - A Matter of Life and Death
M Tech Co. - Chris Cira

NEW BUSINESS OPPORTUNITY TRACK

- 8 a.m. Centripipe (Centrifugally Cast Concrete Pipe)
AP/M Permaform - Steve Henning
- 9:30 a.m. Valve Exercising and Fire Flow Testing for a Reliable Water Distribution System
Hurco Technologies Inc. - Lynn Hurley
- 11 a.m. The Basics of Buying and Selling a Septic or Sewer Business
COLE Publishing - Jeff Bruss

MUNICIPAL TRACK

- 8 a.m. Think Like Grout... For Better Point Repair of Below Grade Structures
Prime Resins Inc. - Scott Kelly
- 9:30 a.m. CCTV Inspections Evolve to Unparalleled Heights
Aries Industries Inc. - George Rada
- 11 a.m. Manhole Chimney Section Rebuilds
Mr. Manhole Systems - Michael Crites

INSTALLER TRACK

- 8 a.m. Membrane Bioreactor (MBR) Technology for Decentralized Wastewater Systems
Bio-Microbics Inc. - Dr. Reza Shams
- 9:30 a.m. Shallow Pressurized Drainfields for Soil-Based Effluent Dispersal
Oreco Systems Inc. - Mark Gross
- 11 a.m. Onsite System Solutions for Shallow Installations
Infiltrator Systems Inc. - Dennis Hallahan

CLASES EN ESPAÑOL

- 8 a.m. Técnicas Corrientes de Limpieza de Tuberías
Innerline Engineering - Jim Aanderud
- 9:30 a.m. Avances en la Evaluación de Tuberías y Tecnologías sin Zanja para Rehabilitación de Tuberías
CDM - Luis Roberto León
- 11 a.m. La Elección de Boquillas en la Limpieza de Drenajes
Innerline Engineering - Jim Aanderud

FRIDAY SESSIONS

March 4, 2011

MUNICIPAL TRACK

- 8 a.m. Large Pipe Inspection
CUES Inc. - N.H. Doc Bennett
- 9:30 a.m. Chemical Grouts & Grouting Methods
Avanti International - Jim Gentry
- 11 a.m. Sectional CIPP Repairs Per ASTM F2599
LMK Enterprises Inc. - Rick Gage

BUSINESS TRACK

- 8 a.m. Save Money - Go Paperless
Clear Computing Inc. - Joel Smith
- 9:30 a.m. Marketing Your Septic/Drain Service Business
COLE Publishing Inc. - Jeff Bruss

CLASES EN ESPAÑOL

- 8 a.m. Anúnciate exitosamente y económicamente, Cuidando tu negocio con atención
Armal Inc. - Angel Romero
- 9:30 a.m. Eficiente las operaciones de limpieza de cualquier red de alcantarillado de América Latina
Hi-Vac Corp. - Gerardo Ramirez

LIQUID WASTE/INSTALLER TRACK

- 8 a.m. Grease Interceptor 101
Schier Products - Charlie Ismert, Ben Ismert
- 9:30 a.m. Datalogging for Onsite Septic System Diagnosis
SJE Rhombus - Scott Rietsema
- 11 a.m. Belt Press Performance Optimization
BDP Industries Inc. - Kelly Brown

SEWER & DRAIN CLEANING TRACK

- 8 a.m. Inline Cutting Tools - Taking Science to the Sewer!
NozzTeq Inc. - Scott Paquet
- 9:30 a.m. Waterjetting! Impact on Drain Cleaning
US Jetting - Nick Woodhead, Ken Bryson
- 11 a.m. Don't underestimate your cable machines?
MyTana Manufacturing - Jack Donaldson

PORTABLE RESTROOM TRACK

- 9:30 a.m. Give Me 3 Reasons Why I Should Advertise My Portable Restroom Company
Satellite Industries Inc. - Mitch Moores
- 11 a.m. How to Start a Business in South America, Marketing and Importing/Exporting
Armal Inc. - Angel Romero



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8 a.m. - 5 p.m.

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2011 EXHIBITOR LIST

Current list of exhibiting companies as of November 2nd, 2010.

List subject to change without notice.



1-800-Plumber A & L Systems, Inc. A Corp./Rooster-Man A.R. North America Abbott Rubber Company Abernethy Welding & Repair Inc. Accent Manufacturing ACE DuraFlo Systems Acro Trailer Advance Pump & Equipment Advanced Biological Marketing Advanced Drainage Systems Advanced Infrastructure Technologies Advanced Pressure Systems Advanced Tank Systems Advanced Treatment Inc. Advanlink International Corp. Aero-Tech AK Industries All Star Equipment Sales, Inc. Allan J. Coleman Allied Construction Products, LLC Allied Forward Motion LLC Allied Graphics Allied Tank Co. AlturaMats Ameri-Cam Engineering Amerik Engineering Amthor International AP/M Permaform Aqua Beam Corporation Aqua Blast Corporation Aqua Mole Technologies Aqua-Zyme Disposal Systems Inc. Arcan Enterprises Inc. Aries Industries Inc. Armal, Inc. Art Co. LLC Arthur Products Ashland Trap Distribution, Co. Atlanta Rubber & Hydraulics Inc. Avanti International Bad Dog Tools BakerCorp Bandlock Corporation BB & T Insurance Svc. Inc. BDP Industries Bear Onsite Benjamin Franklin Franchising Best Enterprises Inc. Betts Industries Big Fish Environmental, LLC Bio Clean Bio-Microbics Inc. BlackGold Biofuels Blasters, Inc. Blue Angel Pumps Boatman Industries Boeger LLC Bord na Mona Bowman Tool Co. Brenlin Co., Inc. Bright Dyes, Division of Kingscote Chemicals Bright Technologies Butterworth, Inc. BW Technologies by Honeywell Cam Spray Canam Equipment Solutions Inc. Canplas Industries Ltd. Cape Cod Biochemical Co. Capital Partners Capital Rubber Corp. Cappellotto S.P.A.	Carbo CAT PUMPS CEMTEC / A.W. Cook Cement Products, Inc. Century Chemical Corporation Champion Pump Company, Inc. Chandler Equipment Inc. Chelsea Products/Div. of Parker Chempace Corporation Chempure Products Corp. Cherne Industries Inc. Clarus Environmental/ Zoeller Pump Company Clear Computing Clearstream Waste Water Systems Inc. Cloverleaf Tool Co. Cobra Technologies Comet USA, Inc. Comforts of Home Compro Industries Conseqtec Consolidated Treatment Containment Solutions Inc. Cosmic Tophat LLC Cougar Vibration a Division of Martin Engineering Coxreels Crane Pumps & Systems Crescent Tank Manufacturing Cretex Specialty Products Cross Bore Safety Association Crust Buster/Schmitz Bros. CUES Inc. Custom Biologicals Inc. Cyclaps Electronics, Inc. D&W Diesel, Inc. De Neef Construction Chemicals Deal Associates Del Vel Chemical Co. Delta Environmental Ditch Witch Dr. Shrink, Inc. Dragon Products Drainables Direct Dresser Roots Dultmeier Sales Durable Manufacturing Durand-Wayland, Inc. Dyna Flex Inc. E.H. Wachs Company Earth Friendly Chemicals, Inc. Easy CAM LLC Easy Liner ECA-SSI Ecological Laboratories Inc. Ecological Tanks, Inc. Electric Eel Mfg. Co. Inc. Eljen Corporation Environmental Products and Access. Envirosight LLC EnviroTub Enz USA Inc. EPA-MOU Partners Explorer Trailers EZ Trakr Federal Signal Environmental Solutions Group Fergus Power Pump Inc. FindaPlumber.com Fisher Research Laboratory Five Peaks Technology FRC Co. Ltd. Flitz International Limited Flo Trend Systems Inc.	Flow-Liner Fluid Systems, Inc. FM Manufacturing Inc. FMC Technologies Force America Inc. Formadrain Inc. Fournier Industries Inc. Fruitland Tool & Manufacturing Gamajet Cleaning Systems GapVax Inc. Gardner Denver Inc. Gardner Denver Waterjet, Sys. Inc. GEA Houle Inc. General Pipe Cleaners General Pump GeoFlow, Inc. Giant Industries Inc. Gloves4you.com Go For Digger Godwin Pumps of America Inc. Goldak Inc. Gorlitz Sewer & Drain, Inc. Goulds Pumps/ITT Industries Granite Leasing Company Great Lakes Equipment Sales, Inc. Green Leaf Inc. Hackney - Division SVC Hammelman Corp. Handago, LLC Hannay Reels Harben Inc. Hathorn Corporation Hedstrom Plastics Hoffman Insurance Brokers Hill Trailer International Henry Pratt Co. Heritage Truck Equipment Inc. Hi-Vac Corporation Hibon, Inc./Div. of Ingersoll Rand High Pressure Equipment Company House of Imports Hurco Technologies Inc. Hydro-Tech Pumps HydroTech Engineered Products I.E. Monitoring Instruments Inc. IHl Compact Excavator Sales Impact Technology Imperial Industries Inc. Industrial Diversified Products Infiltrator Systems Inc. Infrastructure Repair Systems, Inc. InfraTech Insight Vision ITI Trailers & Truck Bodies Inc IVS Hydra Inc. J&J Chemical Company Jack Doherty Supplies, Inc. Jag Mobile Solutions, Inc. Jameson LLC Jet Inc. JETECH, Inc. Jetter Degat Johnny's Choice by Chemcorp Industries Inc. Juggler by Labrie Kar-Tech KeeVac Industries Inc. KEG Technologies, Inc. Keith Huber, Inc. Kentucky Onsite Wastewater Association Kentucky Tank, Inc. Kewanna Screen Printing Kleen Pro Tech Kroy Industries	Kuriyama of America Inc. L.M.T. La Place Equipment Co Inc. Lanses Vanderlans & Sons Co. Lely Manufacturing Lenzyme Incorporated Liberty Financial Liberty Pumps Liquid Environmental Solutions Liquid Waste Technology Little Giant DBA Franklin Electric LMK Enterprises Inc. Lock America, Inc. Loder Logiball Inc. Longhorn Tank & Trailer M.A.R.S. Workwear/Communications Madewell Products Corp. Mainline Backflow Products, Inc. Manhole Guard Masport Incorporated Matrix Payment Systems Max-Life Mfg. MaxLiner Meese Orbitron Dunne Company Mid-State Tank Co., Inc. Milwaukee Electric Tool Milwaukee Rubber Products Inc. Mody Pumps, Inc. Mongoose Jetters Moro USA Mosmatic Corporation Mr. Rooter Corp. MTech Muncie Power Products MWT Corporation Myers Myers-Seth Pump Inc. MyTana Mfg. Company Inc. NASSCO National Oilwell Varco National Vacuum Equipment NAWT Inc. Netafim USA NewTech Inc. Nexstar NILEdor Inc. NLB Corp. Norweco Inc. NovaFlex Hose NOWRA NozzTeq™ Inc. NSF International Nu Flow Technologies, Inc. Nuhn Industries Ltd Oceanquip, LLC Ohio Electric Control, Inc. OMI Industries OmniSite OMSI Transmissions Inc. One Biotechnology Oranco Systems, Inc. Painters Union District 53 Parson Environmental Products Inc. Pat's Pump & Blower Patriot Sports / SKR Holdings Pearpoint, Inc. Peinemann Equipment Pekasys Pelican Worldwide Penny Pockets Pentair Water Perma-Liner Industries, Inc. Petersen Products	Piccadilly Concepts Pik Rite Inc. Pipe Genie Mfg. Inc. Pipehunter Pipeline Analytics PipeLogix Inc. PipeTech Software Piranha Hose Plug-It Products Polar Service Centers Poly-Flow PolyJohn Enterprises Corp. Polylok/Zabel PolyPortables Inc. Porta Pro Portable Sanitation Assoc. Int'l. POSM Soft LLC Pow-R Mole Powertrak International Inc. Premier Tech Aqua Presby Environmental, Inc. Press-Seal Gasket Corp. Presvac Systems, Ltd. Prime Resins, Inc. Prime Solution, Inc. Protective Liner Systems PUMPTec PURE Software Solutions, LLC Rabco RAE Systems RapidView IBAK North America Ratch Electronics, Ltd. Rausch Electronics USA LLC RC Industries Inc. Redkitt Benchiser REED Manufacturing Company Reelcraft Industries Inc. Rehine America Inc. Remate Vision System RIDGID Ritam Technologies, LP Robert H Wager Company Inc. Robesch & C.S.p.A. Roebic Laboratories, Inc. RoelK Rothenberger USA Roto-Rooter Corporation Rotonics Manufacturing Inc. RotoSolutions RouteOptix Inc. RS Technical Services Inc. Rush Refuse Systems SAERTEX multiCam LP Safety Corporation of America Sakor, Inc. Sanitation Insurance Services Satellite Industries Inc. Saverisen, Inc. Savatech Corp. Schier Products ScreenTech Imaging, a div. of Reeda Signs Inc. Sealing Systems Inc. Septic Drainer / Municipal Sales, Inc. Septic Services Inc. Septronics Servant Products Sewer Equipment Co. of America Shamrock Pipe Tools Inc. Sherwin Williams ShuBee SIM/TECH Filters SJE-Rhombus SludgeHammer Group Limited	Sludgenet Soil Shaker 2000 Spartan Tank & Trailer Spartan Tool LLC Specialty B Sales SPIR STAR Sprayraq Inc. Stamp Works Standard Equipment Stellar Industries Inc. StoneAge, Inc. Subsurface Instruments Sunbelt Rentals Sunrise Environmental Super Products Superior Signal Company SuperVac 2000 SVE Portable Roadway Systems, Inc. Synergy Insales by V.P. Marketing T & T Tools Inc. Tank Technologies & Supply Co., LLC TCF Equipment Finance Technical Translation Services TaleSwivel The Service Program The Strong Company Thompson Pump Toico Industries Tracker Solutions Transway Systems Inc. Tri State Tank LLC TRIC Tools Inc. Trident Insurance/Sapcover/ Waste Insurance Program TRY TEK Machine Works, Inc. TSF Co. Inc. TSI Tank Services Inc TT Technologies Inc. Tuf-Tite Inc. Turbo-Fog, Division of Kingscote Ind. Udor USA Under Pressure Systems, Inc. UPS Logistics Technologies US Jetting, LLC USA BlueBook USB-Sewer Equipment Corporation Vac-Can Inc. VacAll Vacutrax Limited / Explorer Trailers Vacuum Truck Rental Vaporooter VAR Co. Vermeer Vivax Corp. Walex Products Co. Wallenstein Vacuum Pumps Wastequip Water Environment Federation Waterblasting Technologies Weber Industries, Inc. (Webtrol) Webster Capital Finance, Inc. Wells Cargo COG Wells Fargo Equipment Finance Western Mule Cranes Westmoor Ltd. Wieser Concrete Products Inc WJTA-IMCA Wohler USA Wolf Creek Company, Inc. Xerxes Corporation Your Local Business on the Web
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1. B&B INTRODUCES ZLINX I/O MODULES, MODEMS

ZlinX Xtreme IP67 outdoor-rated radio modems and I/O modules from B&B Electronics Manufacturing Co. Inc. feature license-free, proprietary RF, available in 900 MHz for long-range and 2.4 GHz for short-range wireless communication for serial or sensor data in harsh and remote environments. The I/O modules include two analog inputs, two analog outputs, two digital inputs and two relay outputs. **800/346-3119; www.bb-elec.com.**

2. ULTIMO INTRODUCES NON-INVASIVE DENSITY, VISCOSITY METER

The non-invasive Density and Viscosity Meter from Ultimo Measurement LLC measures the absolute or relative density or viscosity of any liquid or loose solid material with process temperatures up to 800 degrees F. Featuring vibration-based (non-acoustic) technology, the DVM strikes the outside wall of a vessel to create an oscillation of the vessel wall and the material on the other side of the wall. It then captures and analyzes the oscillations to determine the density or viscosity of the material inside. The system works with steel, aluminum and plastic-based vessels and pipes. **401/647-9135; www.ultimompd.com.**

3. DUPERON OFFERS PERFORATED PLATE SCREEN

The Perforated Plate Screen from Duperon uses Hydropression to clean the static perforated plate of hair, grease, plastics, paper and small particulate matter. Front-mounted debris skimmers guide materials released by Hydropression to the surface for disposal. **800/383-8479; www.duperon.com.**

4. SCANTEK OFFERS PORTABLE ULTRASONIC FLOW METER

The Keiki UFP-20 flow meter from Scantek is designed for up to 30 m/s flow rates from 13-mm to 5,000-mm pipes. It can log 165,000 points and features an LCD display in metric or imperial units, two separate flows or one flow with two-path transduction. The weatherproof unit has USB memory support. **410/290-7726; www.scantekinc.com.**

5. NEPTUNE OFFERS CHEMICAL METERING PUMPS

Series 500 chemical metering pumps from Neptune feature a Variable Oil By-pass stroke adjustment for increased valve performance and the ability to adjust from 10 percent to 100 percent of capacity via micrometer dial and EZE-CLEAN valve cartridges that can be removed for cleaning without disturbing piping to the pump. Capacities include 80 gph simplex and 160 gph duplex at pressures up to 3,000 psi. **215/699-8700; www.neptune1.com.**

6. PALINTEST OFFERS HANDHELD CHLORINE TESTER

The Chlorometer handheld chlorine tester from Palintest uses a DPD testing method and photometric analyzer to produce near instant results without extensive product training or data interpretation. The tester operates using four buttons and features a symbol menu instead of individual languages. The unit can conduct tests ranging from 0.01-5.0 mg/l for free and total chlorine levels. The last 10 results are stored in memory for easy comparison. Features include low power operation with automatic shutoff. Two AA batteries will last for 5,000 readings under normal use. **800/835-9629; www.palintest.com.**

7. PENTAIR OFFERS SYSPEND SANITARY HMI SYSTEM

The Hoffman brand SYSPEND Sanitary HMI System from Pentair Technical Products is designed to enclose, protect and suspend lightweight HMI devices up to 90 pounds. The modular system includes multiple tube lengths and straight L- and U-shaped tubes to meet versatile applications. Rated for Type 4X and IP69K protection in high-pressure, high-temperature washdowns, the unit has integrated side handles for easy repositioning, 20-degree sloped top and bottom for water and cleaning solution runoff and stainless steel construction. **952/934-8220; www.hoffmanonline.com.**

8. RAIN FOR RENT INTRODUCES DV-325C CENTRIFUGAL PUMP

The DV-325c 12-inch centrifugal pump from Rain for Rent is designed for bypass pumping, with flows up to 8,500 gpm, suction lift to 28 feet,

maximum head of 220 feet and solids up to 4.75 inches. The sound attenuated enclosure reduces operation noise as low as 72 decibels at 23 feet. The pump is powered by a 350 hp, Tier 3 engine; an electric-drive is available. **800/742-7246; www.rainforrent.com.**

9. ABRESIST OFFERS KALPOXY LINING COMPOUND

KALPOXY wear-resistant epoxy compound from Abresist Corp. is a jointless lining for structural components and repairs, with more than 70 percent solids. The compound cures in approximately 24 hours at 68 degrees F and can be applied on nearly any surface, even overhead in chutes, pipe systems, vessels, conveying systems and cyclones. The material can be mixed on site and applied by trowel to the desired thickness. No reinforcing is required. **800/348-0717; www.abresist.com/kalpoxy.htm.**

10. PUMP-FLO SOLUTIONS RELEASES PUMP-FLO PREMIUM SOFTWARE

Pump-Flo Premium pump selection software from Pump-Flo Solutions is a subscription-based service for engineers, pump resellers and manufacturers needing to size and select pumps. Supported by 80 pump manufacturers, the software makes pump performance catalogs available in electronic format, providing digitized pump curves from more than 135,000 sources. The program can search from multiple catalogs at a time, share data among users, customize reports and store pump projects on secured Web servers. **800/786-8545; www.pump-flo.com.**

(continued)

product spotlight

Solar-Powered Mixers Save Energy, Reduce Algae

By Ed Wodalski

Solar-powered mixers from SolarBee are designed to solve municipal wastewater quality problems including odor control, discharge permit violations, and high energy costs. The mixers operate continuously, reducing BOD, TSS and ammonia. They also can supply most of the mixing energy required in a treatment pond. Flow rates vary by mixer size, ranging from 1,250 to 10,000 gpm.

Each unit can displace the mixing energy of about 25,000 watts of conventional grid-connected equipment, reducing carbon dioxide emissions by about 148 tons per year. "In a typical partial-mix lagoon system, you might need 20 hp for oxygen and 100 hp to mix," says Joel Bleth, president.

Two units, each replacing 40 hp, can significantly reduce mixing costs. Typical payback on a \$50,000 unit is from one to three years, Bleth says. Further savings can come from reduced dredging costs enabled by improved dissolved oxygen distribution and higher sludge digestion. On the back end of lagoons, solar mixers help control algae blooms, lowering BOD and TSS.

Essentially, in large-volume pumps with a quarter-inch of lift, the mixers are designed to move large amounts of water with minimal horsepower, reducing the run time and operational cost of high-horsepower aerators. The challenge is to capture enough sunlight to supply power.

"In the summer in the United States, all the light squeezed together, from morning to night, is equal to about seven hours at the equator at noon," Bleth says. "In the winter, it's like three hours at the equator at noon. So we have to catch enough power in three hours to run the machine for 24 hours."

The device meets the challenge by capturing twice the radiant energy needed through three adjustable, self-cleaning photovoltaic cells. Power is stored in the mixer's onboard battery (expected 10-year lifespan) to run the 100-pound, high-efficiency mixing motor and self-cleaning, anti-jam, auto-reverse impeller at the base of the unit.

When used in activated sludge reactor basins, the mixers enable operators to reduce aeration energy during non-peak periods without increasing solids buildup. Solar mixers also can be used in water reuse ponds to limit algae blooms and keep irrigation nozzles from plugging. **866/437-8076; www.solarbee.com.**

Solar-powered mixers from SolarBee





11. BILCO OFFERS BIL-GUARD HATCH RAILING SYSTEM

The BIL-Guard hatching railing system from The Bilco Co. is designed to satisfy OSHA standard CFR 1910.23, which requires the exposed sides of roof openings to have some form of guardrail protection. The fixed railing system provides a permanent means of fall protection and mounts directly to the capflashing of any brand of roof hatch. The safety yellow railing is made from a durable fiber reinforced polymer. **203/934-6363; www.bilco.com.**



12. FORSTA INTRODUCES M-90 AUTOMATIC WATER FILTER

The M-90 automated water filter from Forsta Filters measures 12 inches tall and can be incorporated into nearly any piping system. The automatic backwash enables the filter to clean itself as needed and requires virtually no routine maintenance. The unit has a stainless steel body, screen and components, flow capacity up to 100 gpm and screen mesh to 5 micron. The filter has a 1-inch flush valve and uses less than 2 gallons in the six-second backwash cycle. **310/837-7177; www.forsta-filters.com.**

13. SINGER OFFERS RESPONSIVE PNEUMATIC PRESSURE RELIEF VALVE

The Pneumatic Dynamic Lifter relief valve from Singer Valve is designed to handle high pressures and features a compressed air cylinder to hold the



valve closed. The valve also features a surge anticipator with two, three-way solenoid valves to put air into the cylinder under the piston, driving the valve open on power failure. **604/594-5404; www.singervalue.com.**

14. GOULDS INTRODUCES E-SV PUMP LINE

Made to be energy efficient and easy to install, the e-SV line of stainless steel, vertical multi-stage pumps from Goulds Pumps features a hydraulic design for lower NPSHR and target MTBF of 20,000 hours. **847/966-3700; www.goulds.com.**

15. PUREAIR FILTRATION OFFERS SENTRY CHLORINE PROTECTION SYSTEM

The Sentry chlorine protection system from PureAir Filtration is designed to protect against leaks, capturing escaping gas with Safetysorb material and turning it into harmless salts that can be disposed of in a landfill. The dry scrubber system has one moving part, can be installed in three days and customized to meet any size or need. **678/935-1431; www.pureairfiltration.com.**

16. AUTOMATIC SAMPLING

ISOLOK SAL-series auto-samplers from Sentry Equipment allow cost-effective monitoring of sludge-to-solids ratios for high digestion efficiency and produce more reliable composites than manual sampling. The devices collect samples from pressurized process lines up to 300 psi while allowing operators to perform routine sampler maintenance independent of process line operation.

The heavy-duty, isolatable samplers capture up to 25 cc per cycle, handling solids up to 95 mm, to assure a representative sample without mess or inconvenience. Used with a PLC-based Sentry SBC Controller, a sampler can regulate batch, composite or flow proportional sampling, allowing single-grab, continuous or time-regimented sample collection throughout the process. **262/567-7256; www.sentry-equip.com. tpo**



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LISTINGS

Successful business with a large amount of equipment and inventory.

Profitable sewer and septic business in central Pennsylvania. Increasing revenue over the past 3 years and a large amount of equipment and inventory. Equipment is a mix of old and new, but all is working and making money. **Selling price \$349,000.**

Well-Established and Profitable Texas Septic, Sewer & Installation Business For Sale. Price reduced.

Grossing in excess of \$600,000 annually, customer list of nearly 2,000 accounts and 430 contracted customers. Includes nice late model equipment, most are 2007, 2008 model years. Owner retiring after nearly 40 years in business. Real estate available upon request.

Reduced to \$450,000.

Established portable restroom and septic service business located in central Virginia.

Excellent gross each of the past 3 years with no decline in revenue makes this business recession-proof. Steady work including many contracts and repeat customers. Extensive equipment inventory, good revenue, and owner willing to train. Great opportunity for expansion or a new career.

Asking price \$775,000.

New Jersey VIP Restroom/ Portable Toilet Business.

Servicing Metro Philadelphia and Southwest New Jersey with VIP restroom trailers and portables. Many late model assets including 2 nice service trucks, 1 back-up service truck, pick-up truck, 4 VIP restroom trailers, nearly 300 restrooms, sinks, holding tanks, slide-in unit, 2 forklifts, and more. Assets worth over \$300,000 - priced to sell at **\$399,000.**

Green Bay, Wisconsin Area Septic & Drain Business.

Solid and steady revenue history and nearly 20 years established. Excellent opportunity to expand or start your own business. Includes very well-maintained 3,800 gallon septic service truck, fully outfitted 2002 Chevy drain service van, drain & sewer equipment, all office equipment and computers, 2,700+ customer list, and more - a true turn-key or easy expansion opportunity. Very meticulously maintained equipment all kept inside a heated shop. Current owner is retiring. Large shop and real estate is also available if desired at additional cost.

Asking \$249,000.

Dallas/Fort Worth Texas Area Sewer/Rehab Business For Sale.

Drain Cleaning, TV inspection, Pipeline & Manhole Rehab/Relining, Municipal Cleaning and Maintenance business for sale. Excellent opportunity to expand or start your own business. Good revenue history and priced to sell. Includes all equipment to get started. **Asking \$150,000.**

Chicago-Area Biosolids, Land Application, Dredging and Industrial Services Business.

Established in 1985, owner is retiring. Reputable business includes real estate servicing the entire Chicagoland area with sludge and biosolids disposal and treatment services. Real estate and shop included with sale valued at \$750,000, business grosses in excess of \$3 million annually, \$6.3 million in equipment and assets including several TerraGators, Vac Trailers, dump trailers, loaders and much more.

\$4,900,000. Huge potential, good profit and priced right. Non-Disclosure Agreement required, all P&L statements, list of assets, and financials available to qualified buyers.

WANTED. Very serious and well qualified buyer looking for sewer, septic or industrial business in Dallas, Texas area. Must be grossing between \$500,000-\$1,000,000. All inquiries are kept confidential.

Energy Management and Renewable Resources

By Benjamin Wideman

NOISE-REDUCTION

The Qube 400 blower from Tuthill Vacuum and Blower Systems has available pressure up to 18 psig, a noise-reduction system that results in less than 75 dBA at 1 meter at 4,800 rpm/15 psig, and no ASME code concerns if over 14.9 psig — a silencer is not needed because it is integral to the blower. 800/825-6937; www.vacuum.tuthill.com.



Qube 400 blower from Tuthill Vacuum and Blower Systems



KDS Solar liquid desiccant systems from Kathabar Dehumidification Systems

HOT-WATER DEHUMIDIFICATION

KDS Solar liquid desiccant systems from Kathabar Dehumidification Systems use solar hot water as a heat source for dehumidification of outdoor ventilation air. The product fits a wide range of applications at locations with as low as 20 percent relative humidity. It also captures most airborne bacteria, viruses and mold. The unit is made of fiber-reinforced plastic (FRP) with industrial-grade construction. Most efficient when cool or cold, dry air is desired, the system can handle airflows from 750 to 84,000 cfm. 716/875-2000; www.niagarablower.com.

BIOGAS ENGINES FOR CHP

Thermodynamically optimized MAN biogas engines from 2G with 2G-Drive technology are designed for combined heat and power (CHP) installations. Modular design and construction provides flexibility for incremental expansion as power needs increase. 904/579-3217; www.2g-cenergy.com.



MAN biogas engines from 2G

MECHANICAL DEWATERING



Prime Rotary Fan Press from Prime Solution

The Prime Rotary Fan Press from Prime Solution is an EPA-approved mechanical dewatering system that minimizes energy, water and polymer consumption. It has a slow revolution of 1 rpm to minimize the energy usage. Models range use is 0.75 to 13 hp. The wedge wire design of the filter screen minimizes blockage, reducing washwater needs. Depending on the application, the unit uses 13 to 20 pounds of polymer per ton of biosolids

to achieve dry cake at 18 to 26 percent solids for anaerobically digested material, 15 to 20 percent solids for aerobically digested biosolids, and 20 to 32 percent solids for mixed primary and secondary sludges. 269/673-9559; www.psirotary.com.



Electric boilers from Cleaver-Brooks

HEAVY-DUTY BOILERS

Cleaver-Brooks electric boilers are designed for heavy-duty heating as a primary or supplementary source of hot water and steam. The five models (up to 3,375 kW) are quiet, flame-free and compact and need no stack or emission control. The units use resistance elements as a heat source while keeping water volume as low as possible for control and rapid response. The units are local-emission free and provide nearly 100 percent efficiency at all operating points. 229/227-4411; www.cleaver-brooks.com.

HIGH SEPARATION EFFICIENCY

EDUR special-flotation pumps from Shanley Pump and Equipment are available for 500 gpm flotation applications. The pumps achieve separation efficiencies greater than 95 percent with enhanced float solids concentration. Pumps also are available in 316 stainless steel and 329 SS (duplex) construction. 847/439-9200; www.shanleypump.com.



EDUR pumps from Shanley Pump and Equipment



SEL-700GT Intertie Protection Relay from Schweitzer Engineering Laboratories

INTERTIE PROTECTION

The SEL-700GT Intertie Protection Relay from Schweitzer Engineering Laboratories provides complete intertie protection solution for distributed generation that is geared for peak shaving. Optional synchronous generator protection and synchronization automatically adjust generator voltage, speed and phase angle to match line voltage. The unit, which closes the breaker when synchronized, is suitable for harsh environments and temperatures from -40 to 85 degrees C. 509/332-1890; www.selinc.com.

REDUCED CLOGGING

Barnes Solids Handling Series non-clog pumps from Crane Pumps & Systems are designed to reduce clogging in lift stations, reducing carbon emissions from vehicles on service call-outs. 937/778-8947; www.cranepumps.com.



Barnes Solids Handling Series non-clog pumps from Crane Pumps & Systems

CORROSION-RESISTANT HEAT EXCHANGERS



Polytetra Series shell and tube heat exchangers from Asahi/America

Polytetra Series shell and tube heat exchangers from Asahi/America are all-thermoplastic, corrosion-resistant units designed and built to customer specification and fully customizable. The design diverts flow to the side of the shell, avoiding high fluid flow forces that may damage the thin-wall internal tubes. This provides longer life and more even heat transfer by spreading the temperature-control media beyond the point of its initial concentrated contact area. 781/321-5409; www.asahi-america.com.



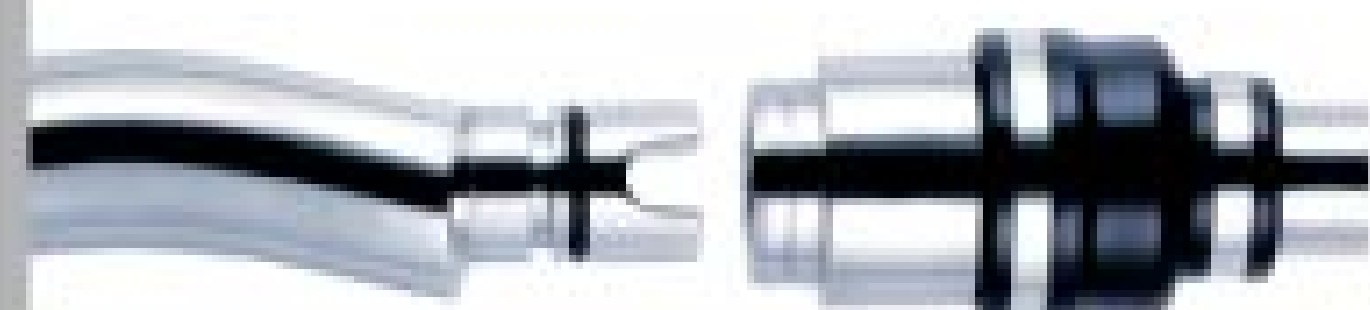
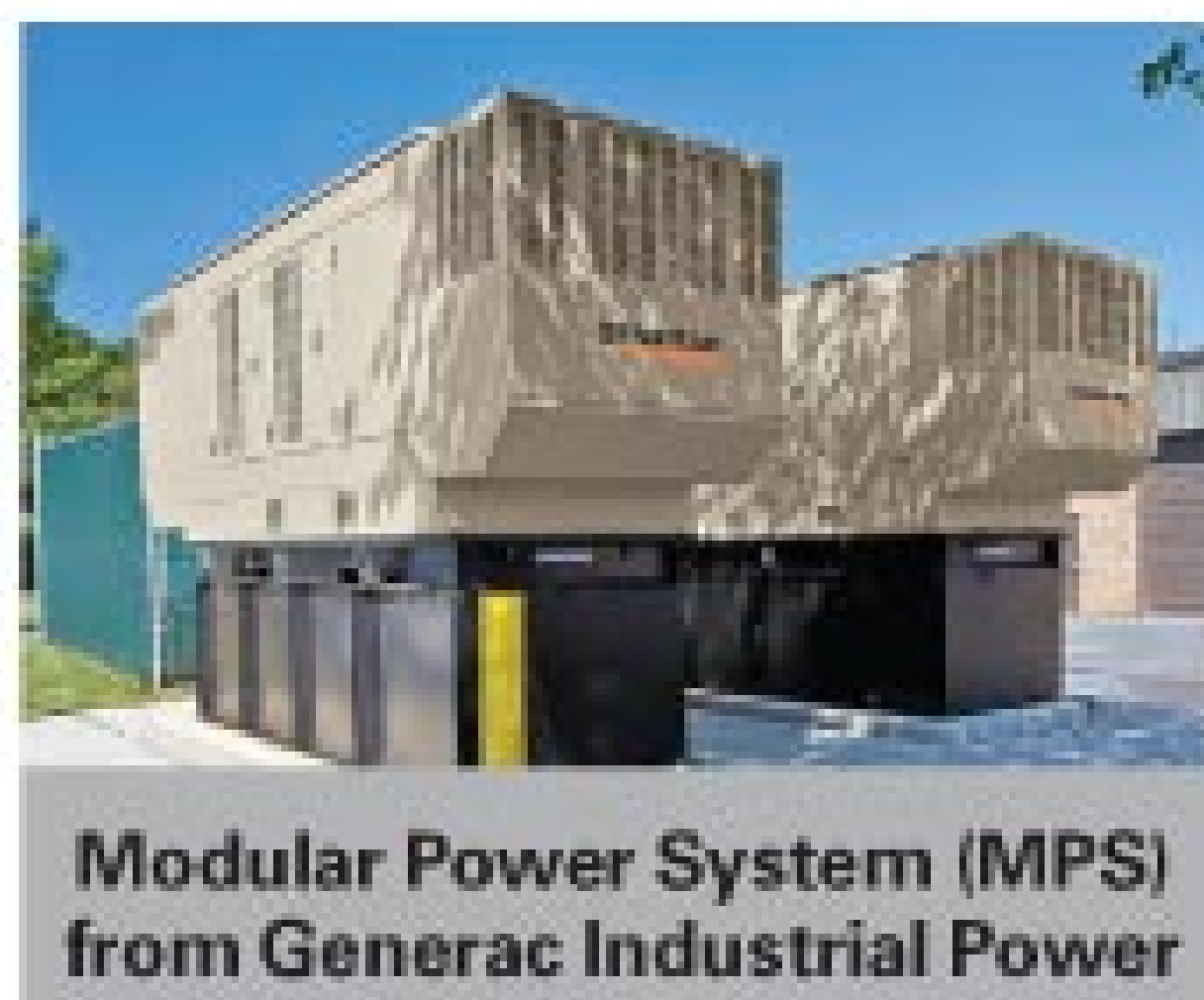
Motor options from Aqua-Aerobic Systems

AERATOR/MIXER MOTORS

Aqua-Aerobic Systems offers high-efficiency and premium-efficiency motor options, including the Endura Series of limited-maintenance motors for Aqua-Jet surface aerators and AquaDDM direct-drive mixers. 815/654-2501; www.aqua-aerobic.com.

EXPANDABLE BACKUP POWER

The Modular Power System (MPS) from Generac Industrial Power is a flexible and expandable backup power system that offers scalability and redundancy in critical power protection. The single-source system allows users to quickly add units as additional power is needed. The MPS platform can run on units that operate exclusively on natural gas. 888/436-3722; www.generac.com.



Smart Rotor (SRT) from seepex

SEPARABLE ROTOR

The Smart Rotor (SRT) from seepex is a separable rotor development. Rotor geometry can be changed quickly using a plug-in connection with no need to dismantle the suction casing, suction pipe or rotor-sided joint. The device can only be used with the Smart Stator (SST). It is available for new pumps and as a retrofit for all SST ranges.

The system includes a two-part pluggable rotor comprising rotor and rotor head. Torque is transferred using the pin and fork principle. For clockwise pumps, the rotor is axially secured in the rotor head using a locking plate. The torque-transfer area is protected from penetration by abrasive solids by an O-ring. 973/864-7150; www.seepex.com.

The system includes a two-part pluggable rotor comprising rotor and rotor head. Torque is transferred using the pin and fork principle. For clockwise pumps, the rotor is axially secured in the rotor head using a locking plate. The torque-transfer area is protected from penetration by abrasive solids by an O-ring. 973/864-7150; www.seepex.com.

SUBMERSIBLE SOLIDS PUMPS

The Gorman-Rupp line of Infinity submersible solids-handling pumps are available in 3-, 4-, 6- and 8-inch flanged discharge sizes in 2 to 75 hp. These combinations provide flows up to 3,100 gpm and heads to 190 feet. Pumps are available in slide construction/trash, and dry-pit versions. All SF Series pumps use NEMA premium-efficiency motors and pass a minimum 3-inch spherical solid. The 8-sided finned motor housing allows optimal heat dissipation, extending motor life and eliminating the cooling jacket. Pumps are available with channel or vortex impellers. Vortex models have Staggerwing technology. 419/755-1011; www.grpumps.com.



Infinity pumps from Gorman-Rupp

DIGESTER GAS STORAGE

Double Membrane Gas Holders from JDV Equipment Corp. store digester gas for use in generators and boilers. The design allows variable gas storage within the inner membrane at constant pressure during gas production and utilization, while the air-inflated outer membrane provides gas pressure and protection. The outer membrane is made of a



Double Membrane Gas Holders from JDV Equipment Corp.

high-tech cross-woven fabric, coated with PVC and UV ray protection. An ultrasonic sensor at the center of the sphere monitors gas volume, helping operators optimize gas utilization to feed generators and/or heating systems. 973/366-6556; www.jdvequipment.com.

BIOLOGICAL NUTRIENT-REMOVAL

The Continuously Sequencing Reactor (CSR) from Schreiber Corp. is a biological nutrient removal system in a single basin. The design allows complete separation of aeration and mixing and has 100 percent aeration turndown capability, allowing aeration to be turned off while the CSR applies its low-energy mixing without aeration.

The basin contents are mixed as the rotating bridge circles the basin. Retrieval diffuser support components and diffusers suspended from the bridge provide the driving force for complete mixing. Close proximity of these components to the tank bottom provides localized scouring to maintain suspension of solids. 205/655-7466; www.schreiberwater.com.



Continuously Sequencing Reactor (CSR) from Schreiber Corp.



Reliance Super-E motors from Baldor Electric Co.

EFFICIENT MOTORS

Reliance Super-E motors from Baldor Electric Co. include 26 premium efficient ratings designed for heating, ventilating and air conditioning; more than 50 washdown, paint-free and all-stainless premium efficient ratings;

and more than 70 premium efficient unit handling ratings. General-purpose ratings are available from 1 to 450 hp, and Super-E severe duty motors are available up to 700 hp in low and medium voltages. Also offered are C-Face motors to 100 hp, explosion-proof motors to 200 hp, and close-coupled pumps up to 50 hp. Reliance premium efficiency custom motors are available through 15,000 hp. 479/646-4711; www.baldor.com.

EFFICIENT TURBO BLOWERS

Dual Core Turbo Blowers from APG-Neuros offer high efficiency in a compact size by combining the design technologies of aeronautic compressor, bump foil air bearing and high-speed permanent magnet synchronous motors with a built-in variable-speed drive and programmable logic controller. With 400 to 700 hp, the devices can attain flow rates up to 20,000 scfm. The product is oil-free. 866/592-9482; www.apg-neuros.com.



Dual Core Turbo Blowers from APG-Neuros

AIR CONDITIONERS

Enclosure air conditioners from Thermal Edge range from 1,000 to 24,000 Btu/hour. In addition to high- and low-pressure switches for self-diagnostics, the wastewater treatment package has a 304 stainless steel finish; fully coated coils and conformal coating on tubing; and remote mounting of the digital controller into the enclosure. 888/580-0202; www.thermal-edge.com.



Enclosure air conditioners from Thermal Edge

(continued)

ENERGY-MANAGEMENT BLOWER

Marketed under the Gardner Denver Hoffman brand of centrifugal aeration blowers, the Revolution blower is an energy-management blower system. The R-200 and R-300 handle flows from 2,500 to 8,500 cfm and pressures from 3 to 15 psig. The blowers use active magnetic bearing technology, surge control, permanent magnetic synchronous motors, integrated human machine interface, programmable logic controller, and variable-frequency drive, all factory prewired and tested in an ergonomic sound enclosure. The unit precisely controls surge and speed to leverage turndown and maximize power savings. 770/632-5028; www.hoffmanrevolution.com.



Revolution blower from
Gardner Denver Hoffman



HT-Series high-speed
turbo blowers from HSI

HIGH-SPEED BLOWERS

HT-Series high-speed turbo blowers from HSI are built to maximize energy savings and minimize maintenance. The air-bearing blowers include models from 5 to 300 hp. The manufacturer says the units can reduce energy costs by 20 to 40 percent. They need no lubrication and have no belts, gears or couplings. Sound level is less than 85 dba.

The HT-Series can operate in parallel with other type blowers and have a smaller footprint. HSI can add process control panels to automate existing equipment to maintain process quality and minimize energy usage. 713/947-1623; www.hsiblowers.com.

FREQUENCY CONVERTER

The Grundfos E-pump program features a high-efficiency MLE motor with built-in frequency converter and controller with pump-related functions. The units are typically used in pressure-boosting systems, industrial cooling systems, and process systems with fluctuating loads. 913/227-3400; www.grundfos.com.



E-pump program from Grundfos

EFFICIENT BLOWER



Bi-lobe (MB Series) and
tri-lobe (ZG) blower packages
from Eurus Blowers

Eurus Blowers offers bi-lobe (MB Series) and tri-lobe (ZG) blower packages, rated for 15 psig pressure, 15 inches Hg vacuum and airflows up to 3,950 cfm. The blowers have integral-shaft ductile iron impellers, dual splash lubrication, oversized roller bearings, piston ring air seals, viton lip seals, and low vibration and noise. They also have high-efficiency integrated intake filter/silencers with washable polyurethane filter media, and combination base and heavy-duty integrated discharge silencer. Optional equipment includes motors to 200 hp, check valve, safety valve, flexible connector, and sound enclosure. 630/221-8282; www.eurusblower.com.

DECANTER CENTRIFUGE

The ALDEC G3 decanter centrifuge from Alfa Laval has a smaller conveyor diameter, allowing room for more liquid in the pond and allowing higher pres-



ALDEC G3 decanter
centrifuge from Alfa Laval

sure on the bowl wall. This can result in drier cake or a less polymer usage. The device also can reduce energy costs for separation. Power plates reduce the loss of kinetic energy when the liquid leaves the bowl, cutting energy consumption by up to 20 percent. 866/253-2528; www.alfalaval.us.

MICROTURBINE CHP

Capstone Turbine Corp. offers combined heat and power (CHP) systems powered by low-emission micro-turbines. The machines operate on a variety of fuels, including digester methane. 866/422-7786; www.capstoneturbine.com.



Combined heat and power
(CHP) systems from
Capstone Turbine Corp.



Heat-recovery
exchangers from DDI

HEAT-RECOVERY EXCHANGER

DDI heat-recovery exchangers use water and direct sludge-to-sludge heat recovery. The units are designed to be compact and efficient and limit plugging and baking. 514/696-7961; www.ddi-heatexchangers.com.

SELF-CLEANING IMPELLER

ITT Water and Wastewater offers the Flygt N Pump with a self-cleaning impeller design that provides a flow path through the pump, greatly reducing clogging from solid objects such as stringy, fibrous material and trash. 203/712-8999; www.flygtus.com.



Flygt N Pump from ITT
Water and Wastewater

MAGNETIC-DRIVE PUMPS

Finish Thompson offers DB Series magnetic drive pumps that operate at up to 70 percent efficiency with broad hydraulic coverage. Impeller diameters are evenly spaced for more precise coverage. The pumps offer high working pressures, allowing high-specific-gravity fluids to be pumped safely. A heavy-duty metallic motor adapter maintains a secure connection between pump and motor.

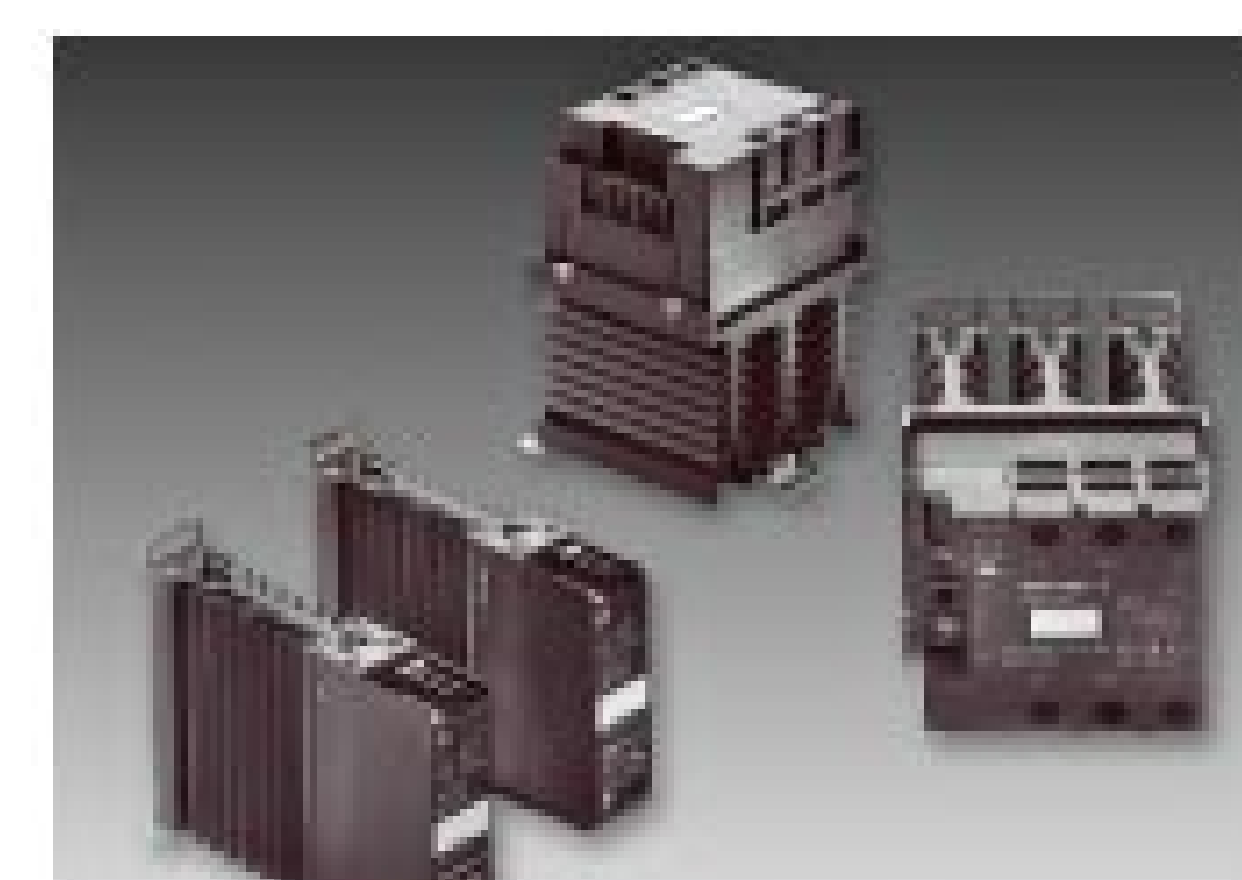


DB Series magnetic drive
pumps from Finish Thompson

Run-dry ability maintains pump integrity during system failures. The units are molded from durable, corrosion-resistant GF polypropylene or CF PVDF. Multiple motor adapters and drive magnet sets enable mounting to any NEMA or IEC motor. 814/455-4478; www.finishthompson.com.

SOLID-STATE RELAYS

Weidmuller long-life, single-phase and three-phase power solid-state relays are designed to switch AC loads up to 20 Amps. They offer a high peak-load rating, with reserves to trip inline fuses. Integrated protective circuits, consisting of varistors and RC-combinations, enable the units to function reliably even in case of capacitive and inductive current spikes. Integrated zero-voltage switching makes single-phase units suitable for switching resistive loads up to



Solid-state relays from
Weidmuller

20 Amps without de-rating. The devices are for 24-volt DC or 230-volt AC control voltage applications. 800/849-9343; www.weidmuller.com.

CUSTOMIZABLE MOTORS

DRP NEMA motors from SEW-EURO-DRIVE meet or exceed new EISA and DOE requirements. The DR motor offers customizable options including brake size, cost-optimized encoders, and mounting type. The motors include advances in energy efficiency and integrated variable-frequency drive control. The DRP is available up to 50 hp when integrated with SEW helical or bevel gear units for the optimum in efficient gearmotor technology. 864/439-7537; www.sewmotortruth.com.



DRP NEMA motors from SEW-EURODRIVE



Heat X sludge heaters from Walker Process Equipment

SLUDGE HEATING

Heat X sludge heaters by Walker Process Equipment are for plants using external sludge heating equipment. Type EB units are combination exchanger-boiler units. Type E units are separate exchanger units used with another hot water source. Type B units are separate boiler units used with Directube internal heat exchangers. 800/992-5537; www.walker-process.com.

ELECTRIC BOILERS

Acme Engineering Products offers packed electric boilers for hot water or steam at capacities up to 4 MW. The units come packaged with all controls prewired. Units use individually replaceable blades on immersion elements to minimize maintenance and reduce service time. The boilers are available for operating pressures of up to 2,500 psi.

Controls include the main power switch, digital staging controller with high limit protection, and an audible and visual alarm circuit with manual reset. The units are available in horizontal and vertical designs and can be purchased with electric steam superheaters. 518/236-5659; www.acmeprod.com.



Electric boilers from Acme Engineering Products



EQP Global motor series from Toshiba International Corp.

GLOBAL MOTORS

Toshiba International Corp. offers the EQP Global motor series, which meets the requirements of The Energy Independence and Security Act. 713/466-0277; www.toshiba.com/EQPGlobal.

BIODIESEL SYSTEM

BlackGold Biofuels offers the FOG-to-Fuel system, which converts fats, oils and greases to biodiesel. The compact, skid-mounted unit integrates into a wastewater treatment plant footprint and can be operated by existing plant personnel. Incoming FOG-laden wastewater from grease



FOG-to-Fuel system from BlackGold Biofuels

traps, clarifiers, DAF tanks or vacuum trucks is separated into solids, water and dry FOG, which then is chemically converted into biofuel and purified, producing biodiesel, glycerin (a carbon source for denitrification) and biobunker fuel (a biobased residual fuel oil). 215/253-5844; www.blackgoldbiofuels.com.

PRIMING SYSTEM

The OVT (oil-less vacuum technology) priming system from Thompson Pump has non-contacting rotors that eliminate internal wear and increase longevity. No recirculating oil is needed, and service is required every 20,000 hours. The units have high-vacuum capability with suction lifts of 28.4 inches Hg, and tolerate accidental liquid carryover. No sealing or lubricating oil is needed in the vacuum compression chamber. 800/767-7310; www.thompsonpump.com.



OVT priming system from Thompson Pump



Velocity MW modular solar power plant from SOLON

SOLAR ENERGY

The Velocity MW modular solar power plant from SOLON offers high output, fast deployment, and low investment risk for wastewater treatment plants. Units can be installed with financing under a Power Purchase Agreement (PPA) in which SOLON assumes responsibility for plant management over the life of the system. Treatment plants pay only a monthly solar electricity fee with locked-in rates over the contract life. 520/807-1300; www.solon.com.

DIESEL GENERATORS

Kohler Power Systems offers 150-, 180- and 200-kW diesel-fueled industrial generators with new digital controllers, enclosure improvements and fuel tank upgrades. New tank accessories include fuel port fill/spill containment devices, high-fuel switch warning systems, and a 12-foot-high emergency vent.

Integrated into the junction box panel, Decision-Maker 3000 uses a digital design, display and interface to provide all vital operational data without aftermarket add-on devices. Digital metering displays total power, total energy and percent of rated power. 800/456-4537; www.kohler.com.



Diesel-fueled industrial generators from Kohler Power Systems



Rotamix system from Vaughan

PROCESS MIXING

The Rotamix system from Vaughan is a low-life cycle-cost process mixing system for digesters, sludge storage and other high-volume applications. Combining uniform and vortical rotation, the system optimizes solids contact with its dual rotational zone mixing pattern. The process improves volatile solids reduction, increases gas production, reduces sludge volume, saves energy during non-peak hours, and allows continued mixing until tank is empty. 888/249-2467; www.chopperpumps.com.

(continued)

EFFICIENCY ENHANCEMENT

Magnetic bearings and high-speed motors from Synchrony improve machine efficiency, reducing bearing losses by using magnetic forces to support and position rotating shafts. This eliminates lubricants, associated viscous friction, and intensive maintenance. The device eliminates gearbox losses by directly connecting a high-speed motor to a high-speed turbomachine. 540/444-4200; www.synchrony.com.



Magnetic bearings and high-speed motors from Synchrony

WATER-TUBE BOILERS

Bryan Steam offers three new Triple-Flex ultra-high-efficiency condensing Flexible Water-Tube boiler models: TF 150, TF 200 and TF 250. They offer inputs from 1,500 to 2,500 MBH with sub-30 ppm NOx using a hybrid metal fiber burner. The boilers offer a guaranteed minimum thermal efficiency of 90 percent in worst-case condensing boiler operating conditions, such as 160-degree return water and 180-degree supply water at 100 percent firing load. Efficiencies up to 99 percent are achievable with lower return water temperatures as found in new building designs. Other features include easily replaceable stainless steel flexible tubes and a variable-speed combustion air blower. Easy-to-remove access panels simplify service and inspection. 765/473-6651; www.bryanboilers.com.



Triple-Flex water-tube boiler models from Bryan Steam

LOW-PRESSURE SCREW BLOWERS

Atlas Copco offers low-pressure ZS screw blowers. The oil-free screw compressor is certified according to ISO 8573-1 Class 0. The flow range is from 176 to 2,700 cfm, and the pressure range is from 4.35 to 17 psig. The plug-and-play package includes an integrated VSD converter and PLC controller. 866/546-3588; www.atlascopco.us.



Low-pressure ZS screw blowers from Atlas Copco



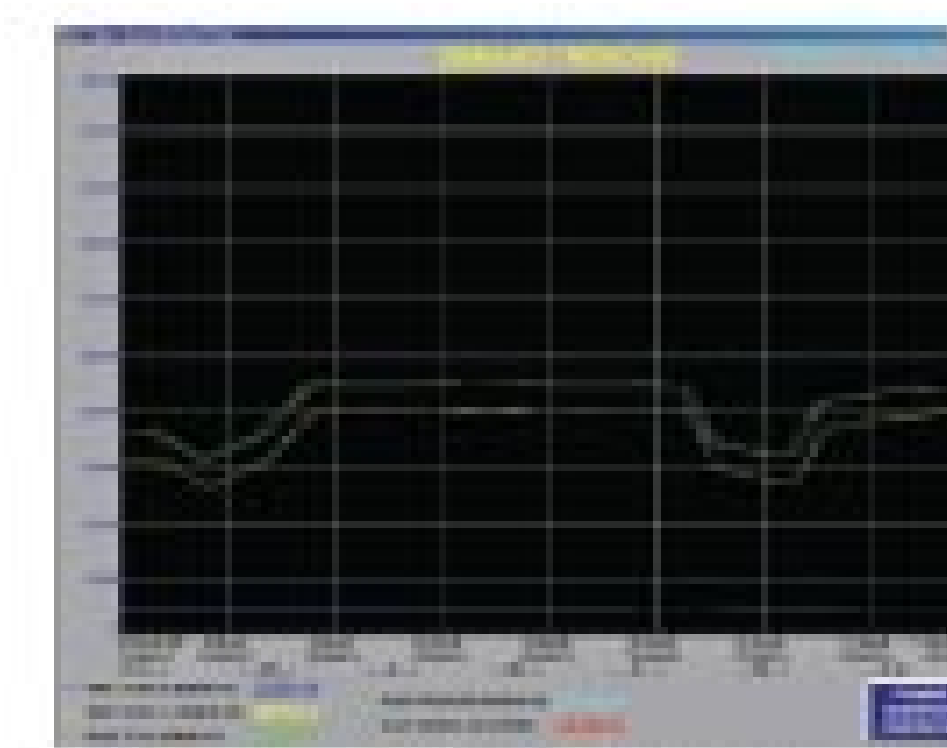
Sunny Central 250U solar inverter from SMA America

SOLAR INVERTER

The Sunny Central 250U solar inverter from SMA America converts DC electricity generated by solar modules into grid-compliant AC electricity. UL-certified and suitable for indoor or outdoor installation, the device provides various communication and monitoring options. 916/625-0870; www.sma-america.com.

CONTROL EXPERTISE

Revere Control Systems offers process automation and control system expertise to help plant managers achieve energy savings through usage visibility, measurement, benchmarking and controlling. RCS also helps optimize equipment utilization, maximize use of existing capacity, lower electric power demand charges, extend equipment life, and reduce downtime. 205/824-0004; www.reverecontrol.com. **tpo**



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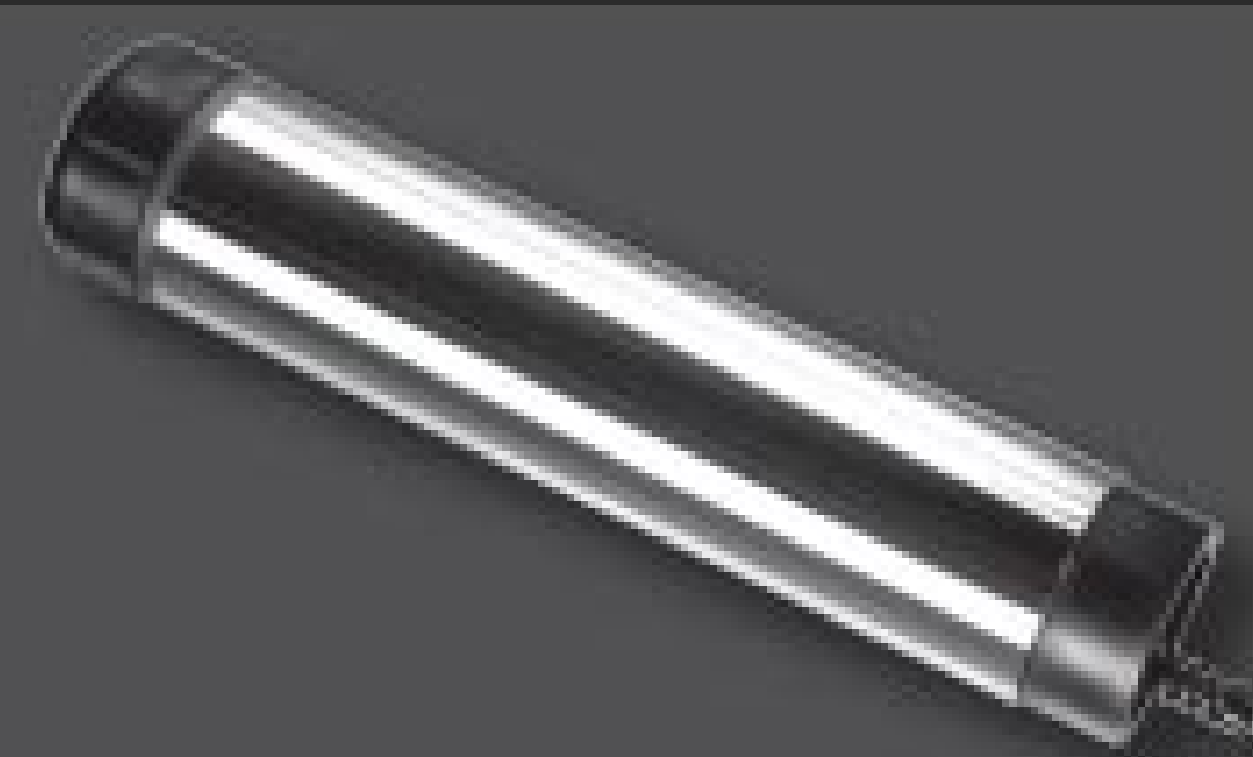
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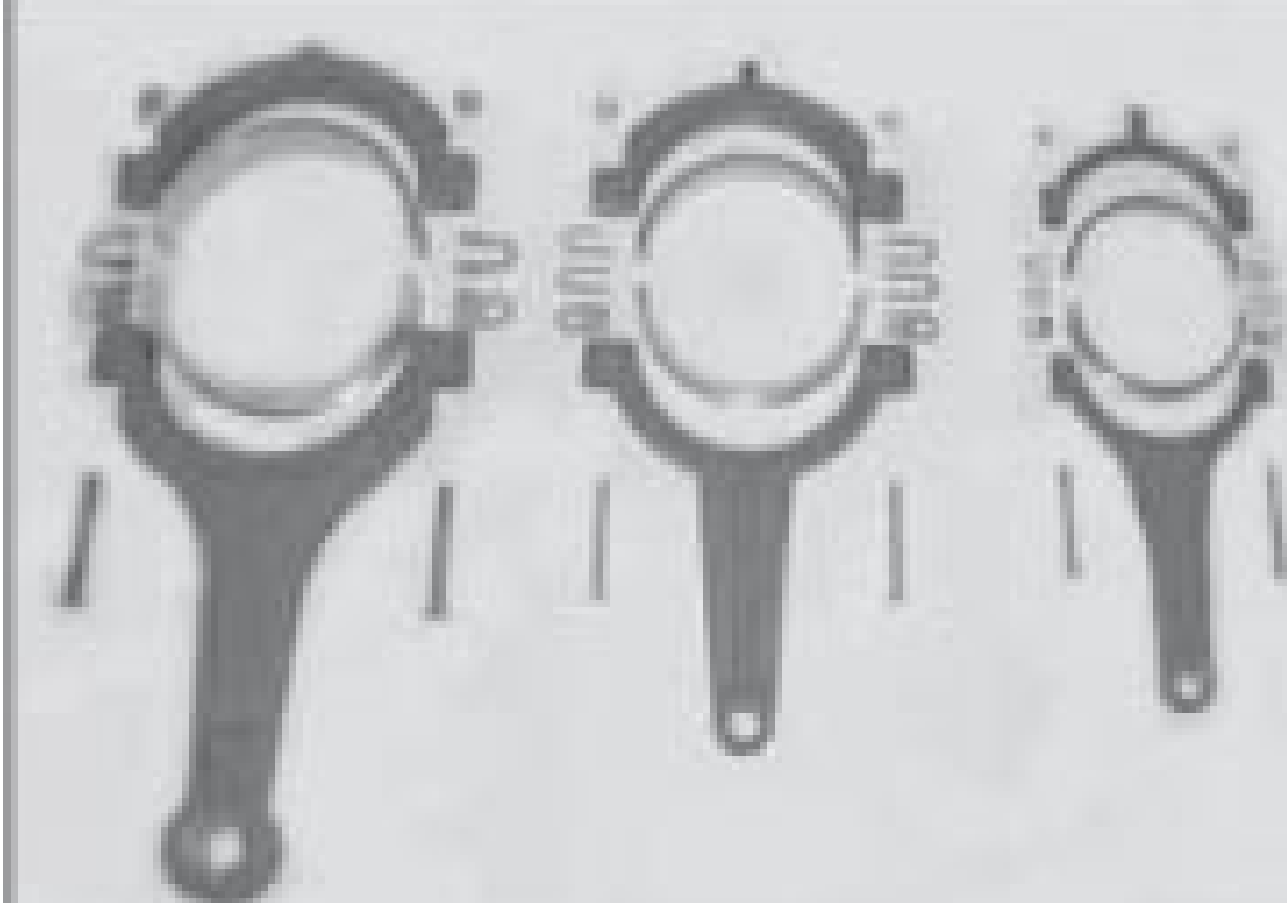
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The Bonita Springs (Fla.) East Water Reclamation Facility processes 4.1 mgd. Extensive landscaping makes it an attractive part of the community.



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Completely Surrounded

EXTENSIVE NATIVE LANDSCAPING AT THE BONITA SPRINGS EAST WATER RECLAMATION PLANT MEANS PLEASING VISTAS FOR NEIGHBORING RESIDENTS AND PLANT STAFF MEMBERS ALIKE

By Pete Litterski

When Bonita Springs Utilities decided to expand its wastewater treatment capacity, it chose a site along Interstate 75 for a new GE-Zenon (a Division of GE Water & Process Technologies) membrane bioreactor treatment plant. But Cliff Morris, chief operator at the new Bonita Springs East Water Reclamation Plant, can barely see his workplace when he drives down the highway.

BSU, a private utilities cooperative serving Bonita Springs and Lee County, was required by zoning laws to minimize the plant's impact on its surroundings along Florida's southwest coast. "We spent hundreds of thousands of dollars on the landscaping of this site," says Morris. The investment included a green border of trees and shrubs that runs all the way around the 162-acre treatment plant site.

Inside is an award-winning treatment plant that went online in 2007 with a capacity of 4 mgd, expandable to 16 mgd as demand grows. That means a layout so spread out that some of the operators ride bicycles from building to building.

NATIVE PLANTINGS

The plant site is in many ways an attractive mirror of its surroundings. The buffer of trees and shrubs around the perimeter may screen the facilities from public view, but the scenery inside is pretty nice on its own. "We've got a great view of a lake right outside our office, and the landscaping includes a lot of native, drought-tolerant plantings," says Morris. "We brought in cypress trees, cabbage palms, wax myrtles, Florida holly, red maples and water oaks."

The lake is a nine-acre impoundment surrounded by a 10-acre wading-bird habitat designed to attract native wildlife. Mike Liggins, BSU director of engineering, says local zoning codes specified the amount of planting

required, and the project had to clear a number of hurdles before it could proceed.

Utility leaders had to work hard to convince county zoning officials that deep-rooted hardwood trees could not be planted in the middle of a facility with holding basins and

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.

"We've got a great view of a lake right outside our office, and the landscaping includes a lot of native, drought-tolerant plantings. We brought in cypress trees, cabbage palms, wax myrtles, Florida holly, red maples and water oaks."

CLIFF MORRIS

an extensive underground network of pipes. There was strong resistance from the developer and residents of a large manufactured home subdivision next to the project site.

Public zoning hearings had to be rescheduled and moved to a civic center in nearby Fort Myers to accommodate large crowds of people protesting the project. For all of that resistance, however, the neighbors now seem to be happy with the result.

A LENGTHY LIST

A file from the Bonita Springs Utilities archives includes the original bid form given to contractors for site landscaping. The specifications show the extent of landscaping required.

The form asked for bids on plantings that include 201 red maples, 131 black olive trees, 299 slash pines, 165 live oaks, 310 cabbage palms and 188 bald cypress trees.

The bid also called for 14,000 square feet of San Augustine sod, almost 40,000 square feet of land seeded in Bahia grass, and more than 6,300 bales of pine straw to lie down as mulch. To keep the landscape watered, the project called for more than two miles of irrigation lines, more than 1,200 spray heads, and nearly 500 drip emitters.

"We had an open house eight months after we started operations," says Liggins. "One of the development's residents, after touring the plant, came up to me and said, 'If I had known the quality of this, I never would have fought it.'"

CONSERVING THE RESOURCE

As the provider of freshwater and wastewater treatment for a 60-square-mile region with about 50,000 residents, the cooperative knows of the need to conserve water and uses its own effluent for site irrigation. Although all of the plant's landscaping is irrigated, the only sprinklers are for the expansive lawn and ground cover. More water-efficient drip emitters handle the rest.

Besides the water used on its grounds, the utility has contracts to sell reclaimed water to area irrigation customers. The agency also took measures beyond landscaping to be neighborly. For example, outdoor lighting is focused downward to limit light pollution.

Although neighbors once fought the plant, BSU's investment in landscaping and design seems to have addressed all concerns. "We don't look like a treatment plant and we don't smell like a treatment plant," Liggins says. "People don't even notice we're here." **tpo**

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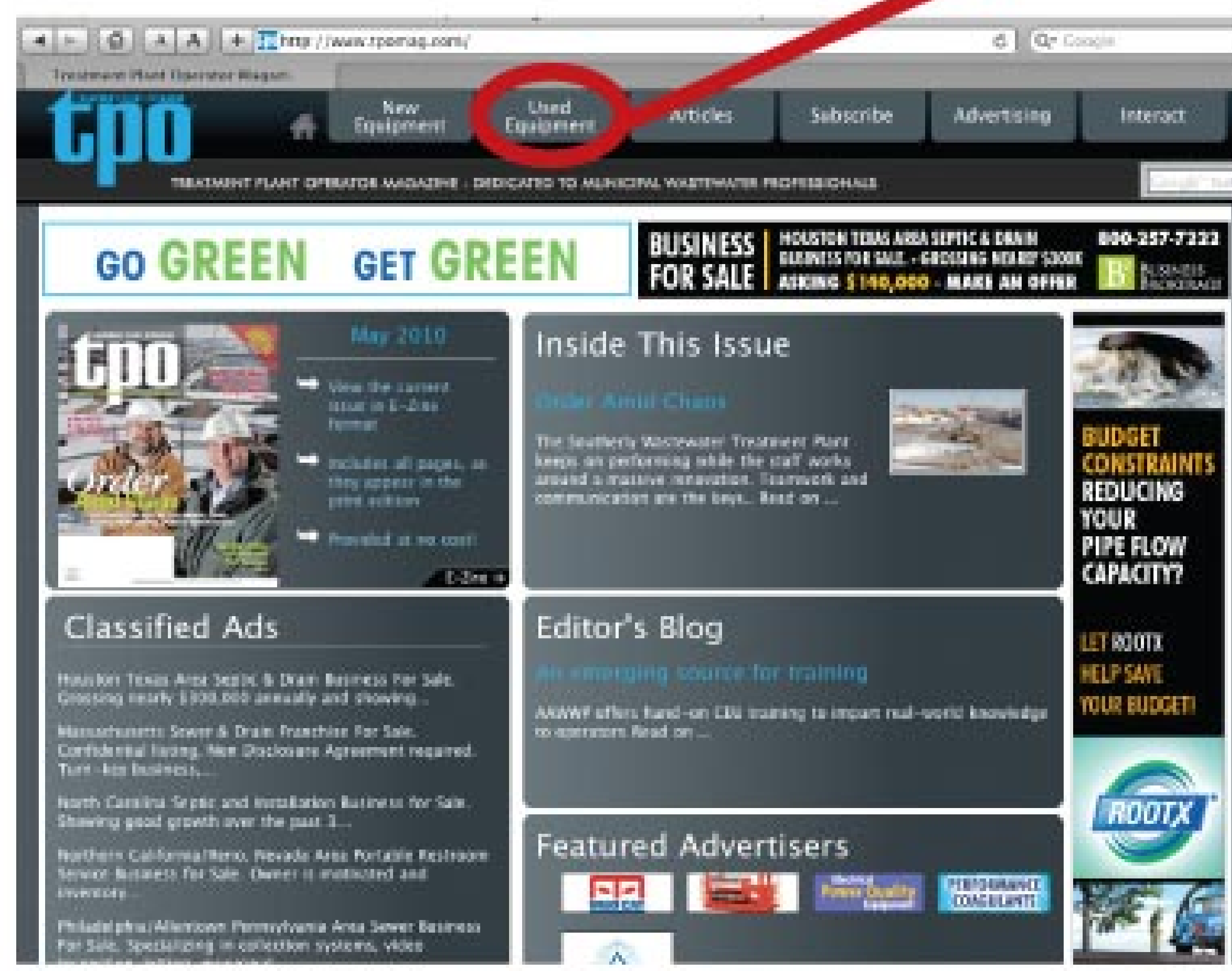
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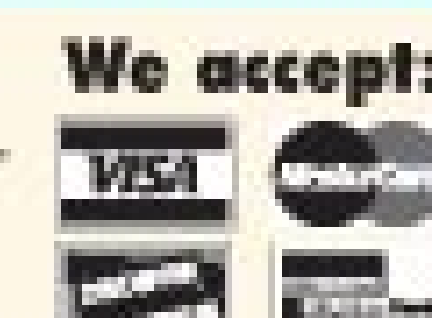
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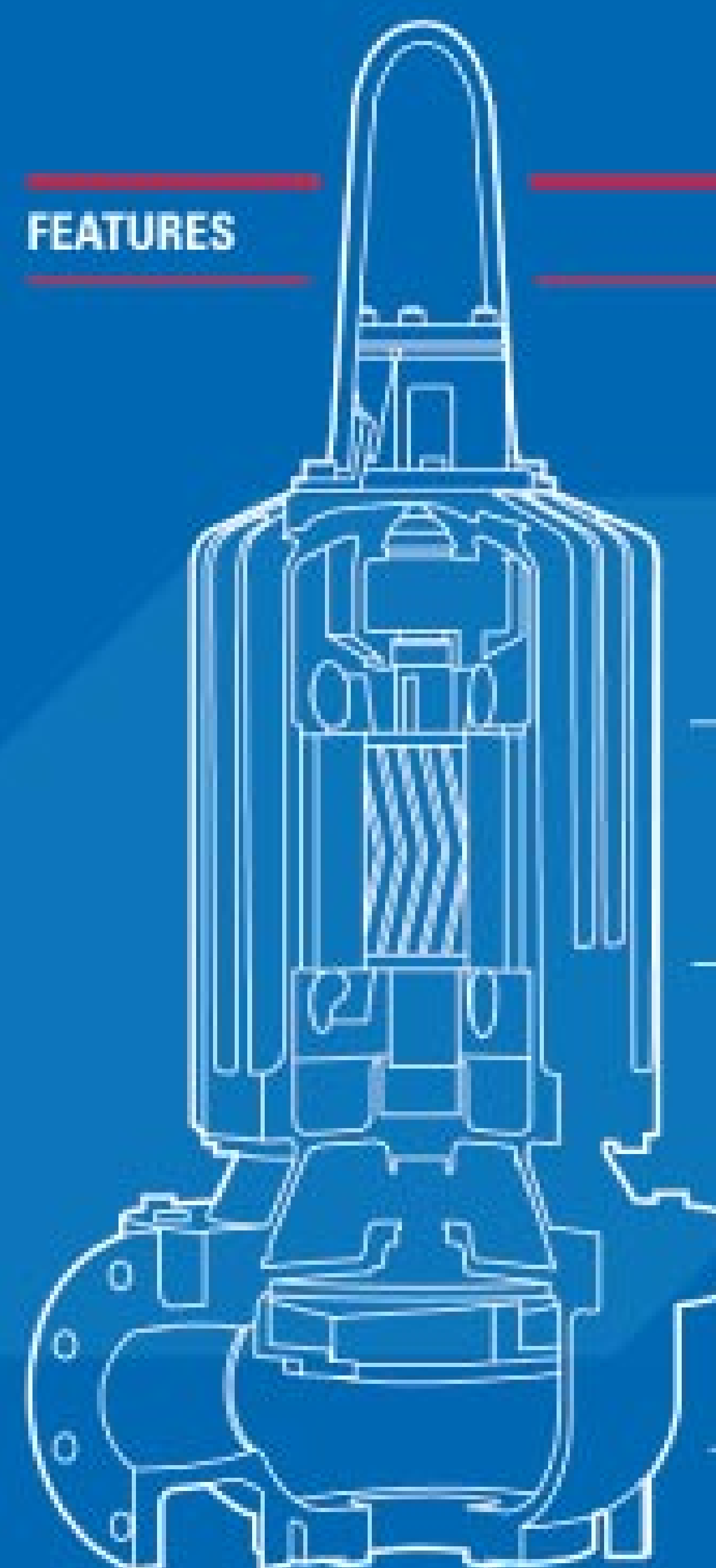


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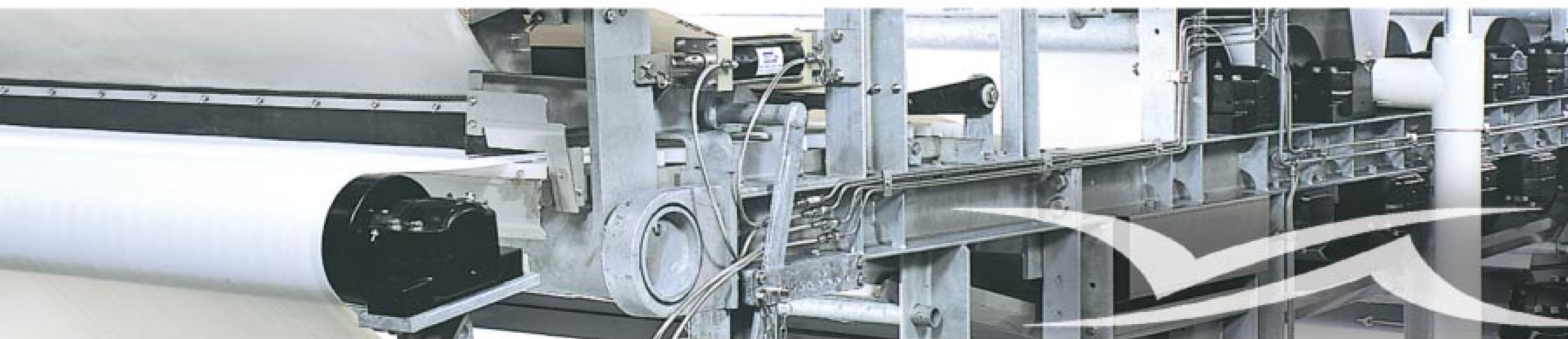


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