

TREATMENT PLANT OPERATOR

# tpo™

DEDICATED TO MUNICIPAL WASTEWATER PROFESSIONALS

www.tpomag.com  
DECEMBER 2009

**How We Do It: Grit removal  
in Council Bluffs, Iowa**

PAGE 26

**Tech Talk: Saving energy  
at treatment plants**

PAGE 13

# Leadership Through Service

**AS CHIEF OPERATOR,  
JIMMY STEWART GUIDED  
HIS TEAM THROUGH TWO  
MAJOR PLANT UPGRADES**

PAGE 16

**Biosolids gasification  
in Sanford, Fla.**

PAGE 20



PAID  
U.S. POSTAGE  
FIRST CLASS  
PUBLISHED  
BY  
COLE  
PUBLISHING  
INC.

CHANGE SERVICE REQUESTED

COLE PUBLISHING INC.  
1720 MAPLE LAKE DAM RD., PO BOX 220  
THREE LAKES WI 54982

## features

### 6 HEARTS AND MINDS: FLASH OF INSPIRATION

An animation program for local schools is at the heart of public education efforts at the Guadalupe-Blanco River Authority.

By John K. Thompson

### 8 TOP PERFORMER – PLANT: ALWAYS LISTENING

Staff members' ideas help turn the City of York (Pa.) treatment plant into a highly efficient, smooth-running, top-performing facility.

By Jim Force

### 13 TECH TALK: NOT JUST FOR APPLIANCES ANYMORE

ENERGY STAR program for treatment plants provides a good start toward an energy action plan that can yield substantial cost savings.

By Lee E. Ferrell, P.E.

### 16 TOP PERFORMER – OPERATOR: LEADERSHIP THROUGH SERVICE

As chief operator at the Shoal Creek Water Reclamation Facility, Jimmy Stewart guided his team through two major plant upgrades.

By Ted J. Rulseh

### 20 GREENING THE PLANT: A BETTER WAY

Sanford South Water Resource Center installs a gasifier that provides environmentally friendly biosolids handling and substantial energy savings.

By Mike Grennier

### 26 HOW WE DO IT: TRUE GRIT

An innovative technology helps an Iowa treatment plant correct a problem with abrasive particles causing excess centrifuge wear.

By Scottie Dayton

### 28 TOP PERFORMER – BIOSOLIDS: CREATING A RESOURCE

Through changes in equipment, the Moccasin Bend treatment plant in Chattanooga, Tenn., avoided landfilling of valuable biosolids.

By Diane Gow McDilda

### 34 IN MY WORDS: FINDING A CALLING

Russell Irwin found rewards in training treatment operators across Nebraska and seeing the results in the form of "sparkling clean effluent."

By Ted J. Rulseh

### 36 GREEN PUMPING

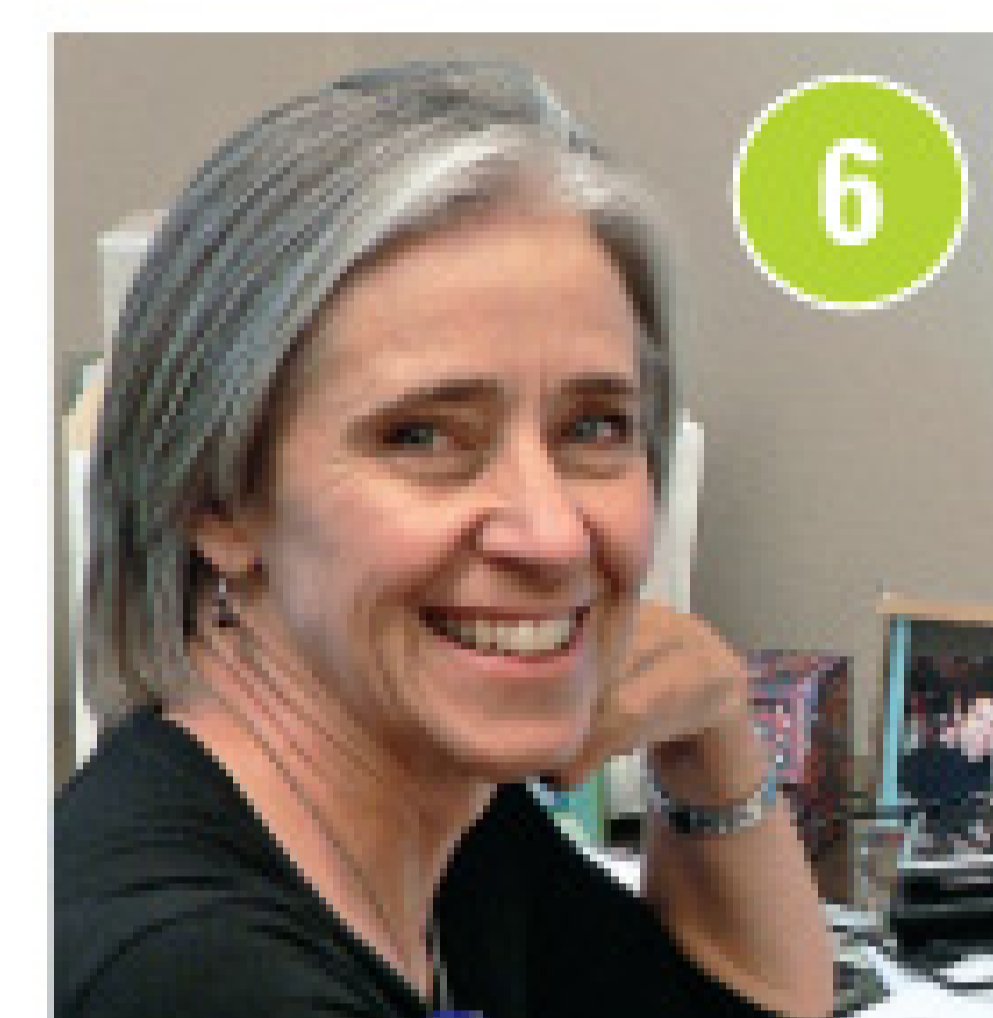
Manufacturers offer high-efficiency pumps for moving wastewater, sludge, and chemicals with lower demand for electricity.

By Benjamin Wideman

## COMING NEXT MONTH: JANUARY 2010

### Product Focus: Process Chemistry/Lab Analysis

- Top Performer – Plant: Broad Run Water Reclamation Facility, Loudon County, Va.
- Top Performer – Biosolids: Johnson Creek (Wis.) Wastewater Treatment Plant
- Top Performer – Operator: Deb LaVergne, Upper Blackstone, Mass.
- Tech Talk: A remedy for pump cavitation
- How We Do It: Online metering for process control and phosphorus removal
- Hearts and Minds: Clean Water Cadets in Hollywood, Fla.
- In My Words: Training at the University of Florida TREEO Center



## departments

### 4 LET'S BE CLEAR: ONE YEAR: YOUR THOUGHTS?

Now that you've seen 12 months of *TPO*, what do you think? How can we serve you better? What would you like to see more of? Or less?

By Ted J. Rulseh, Editor

### 32 INDUSTRY NEWS

### 33 PRODUCT FOCUS: ENERGY MANAGEMENT

By Benjamin Wideman

### 38 WORTH NOTING

People/Awards; Education; Calendar

### 40 PRODUCT NEWS

Product Spotlight: Mini-refinery converts fats, oils and grease into biodiesel.

By Ed Wodalski

### on the cover

Jimmy Stewart served as chief operator at the Clayton County Water Authority's Shoal Creek treatment plant for eight years. During that time, he led his team through major upgrades to the liquid and solids sides of the process. For his efforts, he has earned major awards.

(Photography by Harris Hatcher)

16





## advertiser index

DECEMBER 2009

FREE INFO

Aqua Ben Corporation . . . . .	5	<input type="checkbox"/>
AQUAFIX, Inc. . . . .	39	<input type="checkbox"/>
Bright Technologies/ Division of Sebright . . . . .	19	<input type="checkbox"/>
Byo-Gon, Inc. . . . .	39	<input type="checkbox"/>
Flo Trend, Inc. . . . .	25	<input type="checkbox"/>
ITT Water & Wastewater U.S.A. - Wedeco Products . . . . .	44	<input type="checkbox"/>
Liquid Waste Technology . . . . .	3	<input type="checkbox"/>
Magna-Flow Environmental, Inc. . . . .	27	<input type="checkbox"/>
Noren Products, Inc. . . . .	5	<input type="checkbox"/>
Prime Solution, Inc. . . . .	4	<input type="checkbox"/>
SEL-Schweitzer Engineering Laboratories, Inc. . . . .	43	<input type="checkbox"/>
Simple Solutions Distributing, LLC . . . . .	39	<input type="checkbox"/>
SJE-Rhombus Controls . . . . .	3	<input type="checkbox"/>
SOLOON Corporation . . . . .	15	<input type="checkbox"/>
SRS Systems, Inc. . . . .	39	<input type="checkbox"/>

CLASSIFIEDS . . . . . 39

### FREE Information from Advertisers

Check the Free Info boxes above.

PRINT NAME:

TITLE:

FACILITY NAME:

MAILING ADDRESS:

CITY:

STATE: ZIP:

PHONE:

FAX:

E-MAIL:

Start my FREE subscription to TPO magazine.

No, do not send me TPO magazine.

SIGNATURE (REQUIRED):

DATE:

Fax to 715-546-3786

Mail to: COLE Publishing Inc.  
PO Box 220  
Three Lakes, WI 54562



DEDICATED TO MUNICIPAL  
WASTEWATER PROFESSIONALS

Published monthly by:



CELEBRATING 30 YEARS OF PUBLISHING  
-1979-2009-

1720 Maple Lake Dam Rd., PO Box 220  
Three Lakes WI 54562

www.tpomag.com

© 2009 COLE PUBLISHING INC.

No part may be reproduced  
without permission of publisher.

In U.S. or Canada call  
toll free 800-257-7222

Elsewhere call 715-546-3346

E-mail: info@tpomag.com

Web site: www.tpomag.com

Fax: 715-546-3786

Office hours Mon.-Fri.,  
7:30 a.m.-5 p.m. CST

**SUBSCRIPTION INFORMATION:** A one year (12 issue) subscription to TPO™ in the United States and Canada is free to qualified subscribers. A qualified subscriber is any individual or company in the United States or Canada that partakes in the consulting, design, installation, manufacture, management or operation of wastewater treatment facilities. Subscriptions to all other foreign countries cost \$80 per year. Non-qualified subscriptions are available at a cost of \$60 per year in the United States and \$120 per year outside of the United States. To qualify, return the subscription card attached to each issue; visit www.tpomag.com; or call 800-257-7222.

Our subscriber list is occasionally made available to carefully selected companies whose products or services may be of interest to you. Your privacy is important to us. If you prefer not to be a part of these lists, please contact Kayla at kaylaw@colepublishing.com.

**ADDRESS CHANGES:** Submit to TPO, P.O. Box 220, Three Lakes, WI, 54562; call 800-257-7222 (715-546-3346); fax to 715-546-3786; or e-mail kaylaw@colepublishing.com. Include both old and new addresses.

**ADVERTISING RATES:** Call 800-994-7990 and ask for Phil, Kim, Jim or Winnie. Publisher reserves the right to reject advertising which in its opinion is misleading, unfair or incompatible with the character of the publication.

**EDITORIAL CORRESPONDENCE:** Address all editorial correspondence to Editor, TPO, P.O. Box 220, Three Lakes, WI, 54562 or e-mail editor@tpomag.com.

**REPRINTS AND BACK ISSUES:** Visit www.tpomag.com for options and pricing. To order, call Jeff Lane at 800-257-7222 (715-546-3346) or e-mail jeffl@colepublishing.com.

**CIRCULATION:** Circulation is controlled at 60,000 copies per month except for the Annual Company Directory issue (May) which receives a bonus distribution of 25,000 copies (U.S. and Int.).

ABC AUDIT APPLIED FOR.

# 800-243-1406

## Diesel and Electric DREDGES



### Lagoon Pumpers

# LWT LLC

# PIT HOG™

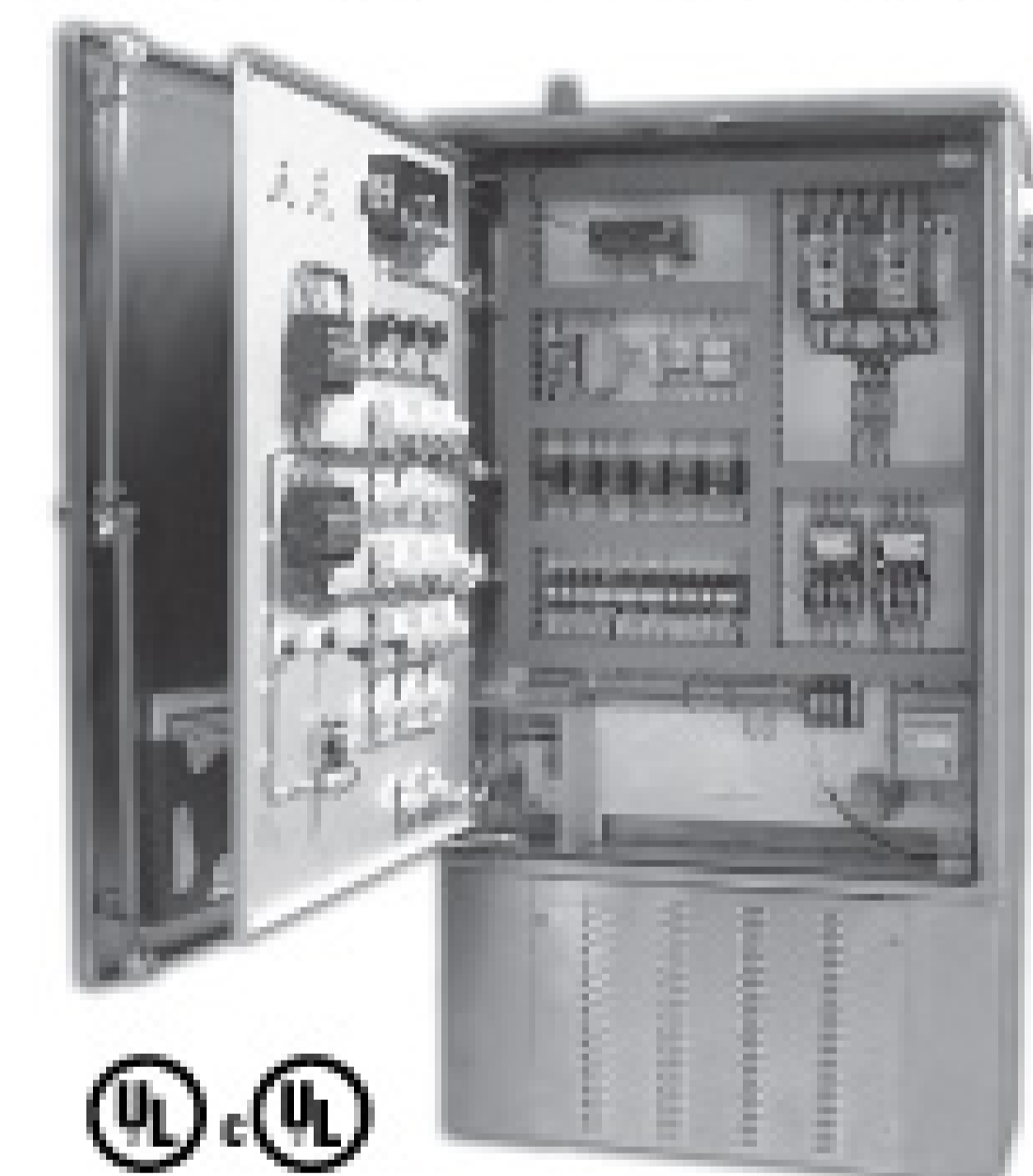
WWW.LWTPITHOG.COM

## Your Stimulus Project Partner

As you begin your economic stimulus projects for water and wastewater infrastructure, you'll need a controls partner that has the **knowledge and experience** to get the job done right the first time.

SJE-Rhombus® has designed and manufactured **reliable, robust** water/wastewater control panels for a variety of municipal and industrial applications for **over 30 years**, including **stormwater, sanitary sewer and leachate lift stations**.

Ask us about the H2O Drive™ variable frequency drive for **constant pressure applications** or learn more on-line at [www.sjrhombus.com](http://www.sjrhombus.com).



### Introducing I-Link™ Lift Station Notifier

Monitor lift stations remotely with this next generation system which collects and reports system status/events to a database application.



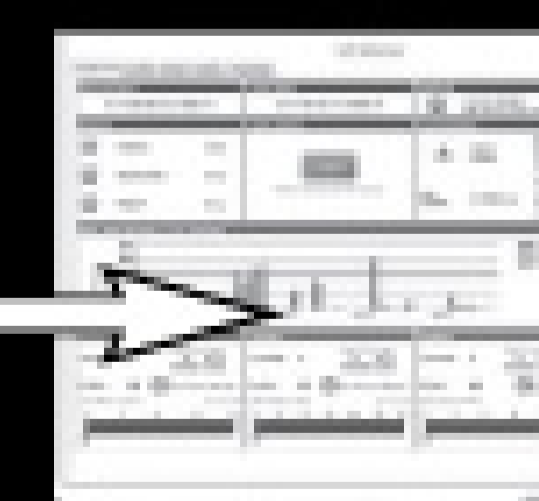
I-Link™ Lift Station Notifier



2-Way Communication



View and Change Parameters from PC



View Web Sample at [www.sjrhombus.com](http://www.sjrhombus.com)

# SJE-Rhombus

1-800-RHOMBUS (746-6287) ■ [www.sjrhombus.com](http://www.sjrhombus.com)

# PRIME Solution inc. ROTARY FAN PRESS

Patents Pending • **Made in the USA**

For less cost, more efficient plant control, reduced man-hours, easy installation and lowest maintenance, the Prime Rotary Fan Press provides you with the quickest return on your investment for all of your sludge handling requirements.

## OUR CUSTOMERS ARE OUR SUCCESS!



The compact skid systems are complete, ready to install within a few hours in some cases, so you can begin enjoying the benefits right away.

### WINNING THE WAR

A rotary Fan Press helps a treatment plant in Virginia dewater biosolids cost-effectively, relieve capacity issues and satisfy regulators.



"The Prime rotary fan press enabled Frisoe to defeat the encroaching biosolids, satisfy regulatory officials, save money and renew the plant's operating permit. He can meet EPA and landfill regulations and is no longer haunted by the 60-day storage requirement." (Feb TPO)



**Now Available!** Two new smaller sized Prime Rotary Fan Press Skid Systems to economically handle even the smallest plant flows.



**We  
Squeeze  
The Crap  
Out Of Water**

"Smell The Love"

**269-673-9559**

**www.psireotary.com**

let's be clear

## One Year: Your Thoughts?

NOW THAT YOU'VE SEEN 12 MONTHS OF *TPO*, WHAT DO YOU THINK? HOW CAN WE SERVE YOU BETTER? WHAT WOULD YOU LIKE TO SEE MORE OF? OR LESS?

By Ted J. Rulseh, Editor

**A** year ago, we launched *Treatment Plant Operator* with a simple statement: "It's your magazine — tell your story!" A number of you have done just that, helping us to develop some fine articles that we hope in turn have helped your colleagues in the wastewater treatment profession.

We wish more plant managers and operators would share their successes — and about that, more later. First, let's review the feedback we've received from readers so far.

Bottom line, it is hard to imagine a more positive response. Here's a sampling:

- I read it cover to cover.
- This is a great magazine.
- The one thing you do, unlike most trade magazines I see, is that you concentrate on people!
- Keep up the good work.
- It really gives my operators who have never been in any other facility something to think about.
- Informative and interesting.
- Finally there's a publication for the common man.

- It's the best of all the trade periodicals I receive.
- It's one of the few magazines that get passed around and read by the plant operators.



### THE OTHER SIDE

Now, if we just listened to comments like those, we could get big heads around here. But we also welcome constructive criticism, and we take it very seriously. For example, readers have questioned whether some of our pictures show workers using unsafe practices or failing to use the appropriate personal protective gear for the job they're doing. We screen our photos carefully for safety issues, but comments and questions we receive about them help keep us sharp.

That aside, readers have asked for more stories about water reclamation. We should do more in that area, and we intend to. Others have said we should add industrial waste-

water treatment to the mix. So far we have focused on the municipal side, but if interest from the industrial community persists or grows, we may need to re-evaluate. So those are some potential areas for improvement. And with that, a few questions for you.

- What specifically do you like best about *TPO* so far?
- What are we not writing about that we should be? Are we neglecting some important area of the treatment field?
- Is there anything we've been including that you *don't* consider valuable?
- In general, what can we do to make *TPO* better?

We wouldn't ask these questions if we didn't truly want to know the answers. So drop a note and share your thoughts with us.

My guess is that operators hold back for two main reasons. One is that you're busy people. The other is that as a group, you're not inclined to blow your own horn. And my answers are: It takes very little time to send a story lead. And by doing so, you help others in your business — you're not just showing off.

### IT'S ABOUT YOU

And speaking of notes, the ones we like best are those that alert us to potentially interesting stories. We wish we would get more of those. My guess is that operators hold back for two main reasons. One is that you're busy people. The other is that as a group, you're not inclined to blow your own horn.

And my answers are: It takes very little time to send a story lead. And by doing so, you help others in your business — you're not just showing off. What does it take to submit an idea? Just a quick e-mail, or a phone call. Nothing fancy whatsoever.

On hearing your suggestion, we'll probe a little deeper to see if your story seems valuable to other operators or plant managers and supervisors. If so, we'll most likely assign a writer to work with you.

What kinds of stories are we looking for? You see them in the magazine every month. Here are some of the regulars:

- **Greening the Plant:** What are you doing to make your operations more environmentally friendly?
- **PlantScapes:** Do you have any interesting landscaping or signage that makes a great impression on your community?
- **Hearts and Minds:** What are you doing to get the public on your side or to draw attention to the profession as a great career choice for young people?
- **How We Do It:** Have you found an interesting answer to a nagging problem? Has a new technology helped you make a big improvement in some area?
- **Worth Noting:** Have any of your people won awards lately? Earned new certifications? Reached significant service milestones (10, 20, 30 years)?

## Keep *TPO* Coming!

It's time to become an official member of the *TPO* family by qualifying your subscription.

It's easy. Go to [www.tpomag.com](http://www.tpomag.com) and subscribe, or fill out and mail back the subscription card that's stitched into the magazine.

Your **FREE subscription** will make sure you continue receiving *TPO* and all the news and information it delivers every month.



### DROP A LINE

We're open to ideas in those areas, and in others you suggest. Consider making a New Year's resolution to contact *TPO* at least once with an idea, or just a comment on how we're doing. It's the best possible way to help us serve you, and your tens of thousands of fellow professionals.

Please start by contacting me at [editor@tpomag.com](mailto:editor@tpomag.com), or by a toll-free call to 877/953-3301. I look forward to hearing your thoughts and ideas and to making the next year of *TPO* even better than the first. **tpo**

## Coagulants and Flocculants

for Septic, Grease, Municipalities and Industry

Save Money • Save Time • Save Polymer

- Dewatering polymers for all dewatering equipment
- All forms: Dry and Emulsion
- Variety of packaging sizes to meet customer needs
- Both East & West coast shipping points
- Expert technical staff
- Specific solutions for our customers

**Call Toll-free:**  
**877.771.6041**

**Aqua Ben Corporation**  
1390 N. Manzanita St. • Orange, CA 92867  
[www.aquaben.com](http://www.aquaben.com) • [sales@aquaben.com](mailto:sales@aquaben.com)

# COMPACT CABINET COOLER

for sealed electrical enclosures

**REMOVE WASTE HEAT  
WHILE KEEPING  
CONTAMINANTS OUT**

**NOREN ENGINEERING & MANUFACTURING**  
[norenproducts.com/cc](http://norenproducts.com/cc)  
650.322.9500

# Flash of Inspiration

AN ANIMATION PROGRAM FOR LOCAL SCHOOLS IS AT THE HEART OF PUBLIC EDUCATION EFFORTS AT THE GUADALUPE-BLANCO RIVER AUTHORITY

By John K. Thompson

**C**urtis Davis, chief plant operator at Victoria (Texas) Regional Wastewater Treatment Center, and Cinde Thomas-Jimenez, education coordinator for the Guadalupe-Blanco River Authority (GBRA), collaborate to promote public education about how to protect precious water resources.

Located near the meandering banks of the Guadalupe River, the Victoria plant sits 30 miles inland from the Gulf of Mexico and within a two-hour drive of Corpus Christi, Houston, San Antonio, and Austin. Known as The Crossroads, Victoria is a regional hub for a seven-county area with more than 250,000 people.

Davis and Thomas-Jimenez are part of a GBRA effort to help the public get the big picture about the role treatment plants play in community clean-water infrastructure. "Cinde gets the word out to a lot of important organizations that we don't often get a chance to connect with easily," says Davis. "She starts with the legwork involved in getting our tours set up. Once she's completed her pre-tour activities such as visiting schools, then I try to get them up close to the on-site action at the plant."

## IN A FLASH

Their collaborative work provides a vital link between plant operations and schools. Thomas-Jimenez worked with graphic artist Scott Rolfe to create a multimedia project that leads viewers through areas of the household where wastewater originates. The program shows uses and misuses of water in the home.

Members of the GBRA team: from left, Cliff Prout, Robert Foley, Dennis Gunter, Wendell Gillit, Bill Young, Curtis Davis, Terry Ramey, Carlton Hoefling, Ross Chapman, Lorenzo Gonzales, Keelyn Underwood and Frank Tompkins. Not pictured are Frank Ceballos, David Weaver and Sara Vazquez.



PHOTOS COURTESY OF CURTIS DAVIS

## What's Your Story?

**TPO welcomes news** about your public education and community outreach efforts for future articles in the Hearts and Minds column. Send your ideas to [editor@tpo.com](mailto:editor@tpo.com) or call 877/953-3301.

Cinde Thomas-Jimenez, education coordinator for the Guadalupe-Blanco River Authority.

Using Flash animation, they can transmit plant management concepts to off-site classroom computers in area schools. "Our GBRA Wastewater Treatment Flash animations were developed with the assistance of many of our plant operators," says Thomas-Jimenez. "They reviewed them during development and gave us their input. This was important to me as an educator because they are the experts, and their input gives our presentations to the public more validity."

She likes the video on-demand quality of the animations. "The Flash format is a very friendly animation format for computer users, and most computer systems will support its use," she says. "Our animations are pulled up for users directly from our Web site. All they need is the Adobe Flash Player or a Flash plug-in for their browser."

## DEALING WITH DISTANCE

Thomas-Jimenez and Davis keep the focus giving the public a window into the world of wastewater treatment. "When a school group calls and requests a tour, I work closely with the teacher to make sure they have covered the basic concepts of wastewater plant operations before they arrive at the plant," Thomas-Jimenez says.

"If possible, I go to the school ahead of time to show the students the animation and answer any questions. If my schedule does not allow a visit, I encourage them to present the animations to the students in class.

"We've found that the animations work as an effective virtual tour. After viewing it, students are familiar with the terminology, processes, and various treatment steps. That makes their tour more meaningful. Students are less overwhelmed by the terms and processes when they arrive. They are free to ask questions of the expert tour leaders, and ask the plant operators more specific questions."



Chief operator Curtis Davis on an aeration basin.

## BOOSTING CAREERS

GBRA also works closely with students at nearby Victoria College and the University of Houston — Victoria. During tours for those students, Davis outlines and explains the Texas Commission on Environmental Quality (TCEQ) tiered certification levels. “I like to point out for our students that we have 10 operators at this facility

“I like to point out for our students that we have 10 operators at this facility and over 300 years of combined service. It shows that our industry has real career opportunities where you can enter the field and grow as far as you want professionally.”

### CURTIS DAVIS

and more than 300 years of combined service,” he says. “It shows that our industry has career opportunities where you can enter the field and grow as far as you want professionally.”

Davis also encourages them to consider the challenges of working in treatment operations. “Students need to understand that this is a 24/7 industry,” he says. “I try and convey the type and amount of work that goes into treating wastewater, to inform them of what is required to do the job, and to impress upon them that treatment plant operators have a serious level of responsibility in the community.” **tpm**



Kids tour the GBRA lab with employees Keelyn Underwood (right) and Carlton Hoefling.

Davis likes to make sure students walk away from tours with an understanding that “When they put the wrong things in drains, it all ends up at a treatment plant somewhere, and someone will have to clean it up, someone paid by a ratepayer like their moms or dads. Hopefully, they remember that lesson so they make informed decisions.”



Happy Holidays  
from our door  
to yours!

It is in the spirit of the season  
that we say Thank You  
and may Peace and Joy be yours  
in the coming year.

YOUR FRIENDS AT  
COLE publishing

Everyone talks about creating  
a greener environment.

You actually do it.

Find the tools you need to keep your communities green at

[www.colepublishing.com](http://www.colepublishing.com).

Publishing environmental trade magazines since 1979.

# Always *Listening*



## profile



### City of York (Pa.) Wastewater Treatment Plant

**BUILT:** 1914; major upgrade 1988-91  
**POPULATION SERVED:** 75,000  
**FLOWS:** 26-mgd design, 12-mgd average flow  
**TREATMENT LEVEL:** Tertiary  
**TREATMENT PROCESS:** Kruger A/O anaerobic-oxic treatment  
**RECEIVING WATER:** Codorus Creek  
**BIOSOLIDS:** Cake to land application  
**EMPLOYEES:** 41  
**WEB SITE:** [www.yorkcity.org](http://www.yorkcity.org)



Steve Douglas, general manager at the City of York Wastewater Treatment plant, draws on ideas from his team to improve processes and drive operating costs down. (Photography by Dane Hildebrand)

## STAFF MEMBERS' IDEAS HELP TURN THE CITY OF YORK (PA.) TREATMENT PLANT INTO A HIGHLY EFFICIENT, SMOOTH-RUNNING, TOP-PERFORMING FACILITY

By Jim Force

### IF YOU'RE LOOKING FOR GENERAL MANAGER

Steve Douglas at the City of York (Pa.) Wastewater Treatment Plant, you probably won't find him in the office. More than likely he'll be out in the plant, walking the rounds in jeans and a T-shirt, talking with his operators, asking questions and soliciting ideas.

His approach reflects an *esprit de corps* here that has made this 12-mgd (average) advanced facility one of the best in EPA Region III, if not the nation. "As managers, we don't just sit around a table and talk," he says. "We get out in the plant, and talk with our operators. We encourage their input, which we call Employee Initiatives. It's not a formal program — it's just part of what we do here."

A day in the life at the City of York plant often includes discussion of ideas and issues. From left are Vernon Billet, maintenance crew leader; Mack Wynegar, maintenance mechanic II; Chad Arnold, process control manager; and Steve Douglas, general manager.

The approach works, as evidenced by the list of process improvements and cost-cutting ideas implemented almost monthly. It also bolsters the self-image of the operators and makes them part of the success of the operation, factors that Douglas believes ought to be promoted as the wastewater profession attempts to recruit new talent.

### FLEXIBLE PROCESSES

York, about 20 miles south of the state capital (Harrisburg) and part of the Chesapeake Bay watershed, is a biological treatment operation with a configuration that gives it great flexibility. It features three Kruger A/O anaerobic-oxic treatment trains. Train 1, a pure-oxygen activated sludge plant, was decommissioned in the 1990s.

Train 2 is made up of two flowpaths, each with one anaerobic and four oxic compartments. Train 3 consists of three flowpaths set up in a similar fashion as those at Train 2. This design allows for biological

phosphorus removal, in addition to which the process converts ammonia to nitrates.

Raw wastewater enters the plant through a headworks structure containing a pair of mechanically cleaned bar screens. A tandem of fixed bar screens is on standby for bypass conditions. Two grit chambers use differential settling rates to remove inorganic material and prepare the wastewater for biological treatment.





## MEET THE TEAM

It takes a team to make the City of York Wastewater Treatment Plant function. General manager Steve Douglas credits his entire staff for the plant's performance. Staff members in the treatment plant are:

Rudy Zimmerman, operations manager; Deb Allison, inventory and records manager; Carol Godfrey, data entry clerk; Vernon Billet, maintenance crew leader; Billy Puckett, Jeff Sunday, Tim Brenner and Mack Wynegar, maintenance mechanic II; Leo Hoffman, A shift supervisor; Frank Rizzuto, B shift supervisor; Larry Day, C shift supervisor; Joseph Concino, chief chemist; Sarah Evans, Erin Barkdoll and Matt Yeatts, chemists; Scott Millar, Ronald Shaffer, Dennis Leidig, Paul Zenkowich, Chhoeuth Yeng, Shawn Renoll, James Hollinghead, Eric Stoudt, Brandon Anderson, Claudio Ferrer Sr., and Paul Kulp, plant operator II; Jan Markey, Frank Dapp and Mark Simpson, filter dryer operator; and David Silk, plant operator I.

Out in the street helping to keep wastewater flowing and keep out I&I are: Jack Longstreet, sewer maintenance superintendent; Veronica Whaley, pretreatment permit/compliance manager; Jessica Quinn, pretreatment compliance officer; Mike Bortner and Steve McKinney, wastewater collection operator II; Carlton Baker, Kevin Howell, Ronnie Register and Fred Rodriguez, wastewater collection operator I.

UPPER LEFT: Scott Millar checks one of the engines in the facility's cogeneration system. LOWER LEFT: Filter dryer operator Mark Simpson tends to the facility's Andritz centrifuge, used to dewater biosolids.

After primary clarification, about 42 percent of the flow passes to anaerobic-oxic Train 2 by gravity. The other 58 percent is pumped to Train 3. The primary effluent is then mixed with return activated sludge and distributed equally between the treatment train flowpaths.

Next, the wastewater flows through the anaerobic zone before entering the first of four oxic zones. While in these tanks, the water is treated for conventional pollutants as well as phosphorus removal and ammonia conversion. The configuration gives Douglas and his staff a great deal of flexibility to meet changing conditions and conserve energy.

“As managers, we don’t just sit around a table and talk. We get out in the plant, and talk with our operators. We encourage their input, which we call Employee Initiatives. It’s not a formal program — it’s just part of what we do here.”

### STEVE DOUGLAS

“If I see 15 to 25 mg/l of ortho-phosphorus at the end of the anaerobic zone, I can expect to see around 0.3 mg/l coming out of the last oxic zone,” he reports. “Depending on flow conditions, we can take a train or a particular pathway out of service if we don’t need it, and thereby save on our energy consumption. It makes for easier treatment.”

Following treatment, the effluent from Trains 2 and 3 moves on to secondary clarifiers, and then to the advanced treatment section of the plant. A traveling bridge sand filter (Siemens Water Technologies) removes additional BOD and suspended solids, and a UV system (TrojanUV3000Plus series) dis-

infects the effluent before it cascades through a re-aeration channel and into Codorus Creek. The effluent achieves a minimum dissolved oxygen content of 5.0 mg/l. Because York is in a region with abundant limestone deposits, pH adjustment is not necessary.

### CONTRACTOR TAKES THE CAKE

Most of the solids accumulating in the secondary clarifiers are returned to the biological processes. The typical return sludge rate is between 20 and 25 percent of the plant influent flow, an adjustable amount based on laboratory analysis of the mixed liquor suspended solids (MLSS) and the sludge settling rates.

Waste activated sludge goes to flotation thickeners and then to anaerobic digesters for further biological stabilization. All solids removed from the five primary clarifiers are also sent to the digesters,

where they are stabilized over 15 to 30 days. Digester gas containing 65 to 70 percent methane fuels Caterpillar engines (one 1,150-kW, three 460-kW units) driving Kato generators to provide about 21 percent of the power needed for the treatment processes. Heat recovered from the engines is used in the digesters and to heat several of the treatment plant structures.

For dewatering, York uses centrifuges (Andritz) to obtain an 18-percent solids cake. Synagro, a private contractor, hauls the cake to area fields for beneficial reuse.



Shawn Renoll, operator II, checks plant status from the computer room using the SCADA system.

“If I see 15 to 25 mg/l of ortho-phosphorus at the end of the anaerobic zone, I can expect to see around 0.3 mg/l coming out of the last oxidic zone. Depending on flow conditions, we can take a train or a particular pathway out of service if we don’t need it, and thereby save on our energy consumption.”

**STEVE DOUGLAS**

**City of York (Pa.) Wastewater Treatment Plant**  
**PERMIT AND PERFORMANCE**

	INFLUENT	EFFLUENT	PERMIT
<b>BOD</b>	237 mg/l	2 mg/l	15 mg/l summer 20 mg/l winter
<b>TSS</b>	210 mg/l	2 mg/l	30 mg/l
<b>Total P mg/l</b>	4.6 mg/l	0.7 mg/l	2.0 mg/l
<b>NH3-N</b>	17.0 mg/l	0.2 mg/l	1.7 mg/l summer 2.1 mg/l winter

it done. We believe that the only bad idea is the one that is never expressed.”

The list of good ideas and benefits derived from them over the last 10 to 15 years is impressive. In just the last few months, Douglas counts a number of key changes and improvements that have saved significant operational dollars while making life easier for the operators. For example:

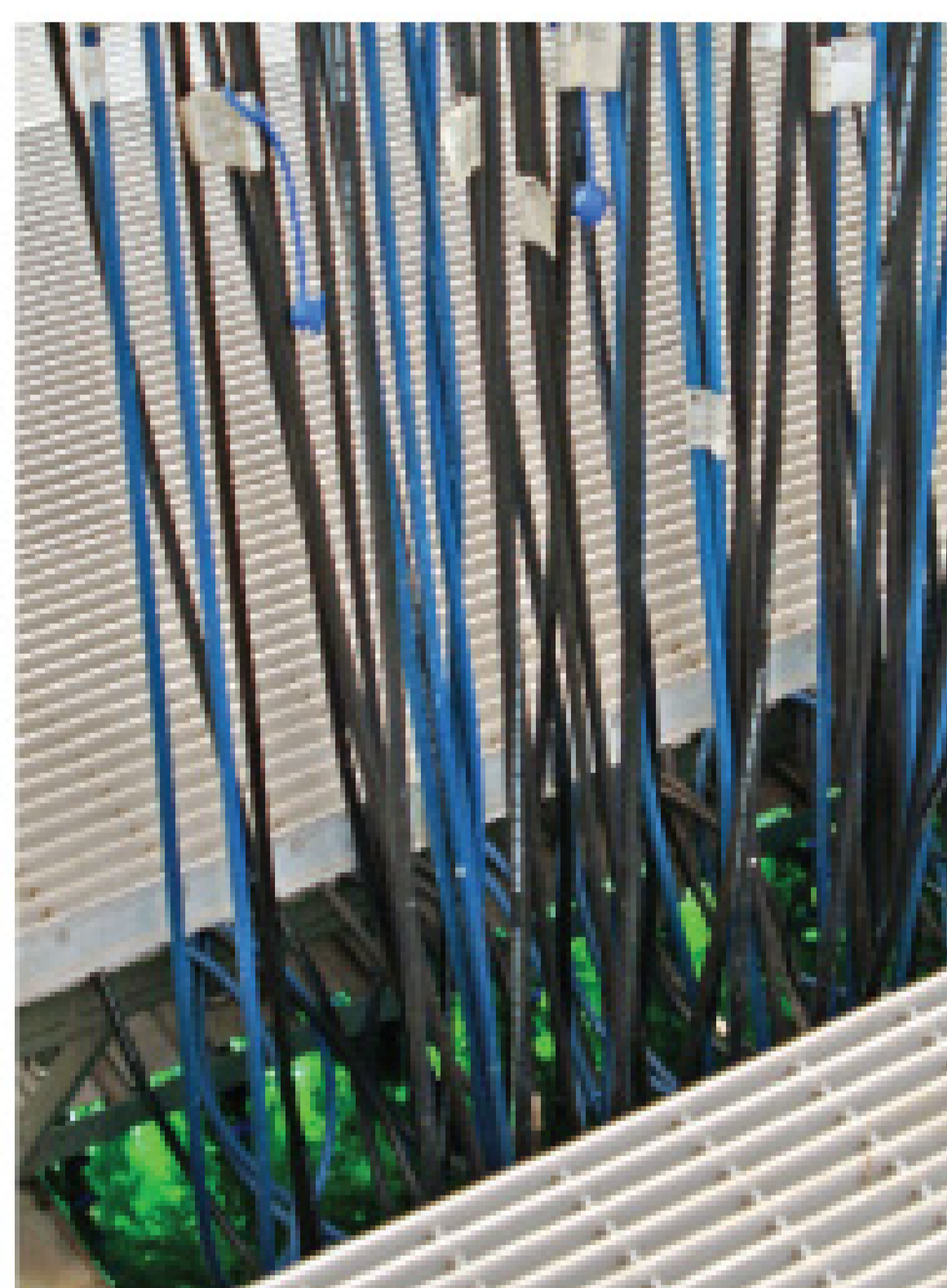
- A leaf blower added to the sand filter dries off the track the bridge travels on, preventing condensation that would cause the wheel to slip, especially in cold weather.
- To avoid freeze-ups of the bar screen combs during the winter months, operators added curtain walls and old belt press media to act as insulation and help hold heat in the bar screen housing.
- Sliding gate operators added to the primary clarifiers mean the operator doesn’t have to get a mechanic to use a backhoe to slip a plate down the opening.
- Motorized gate operators make it easier and faster to open and close gates, especially critical during storms.
- An automatic sampler in the process return flow gives operators a better feel for plant loadings and makes mass balances easier to do.
- A UV-wiper testing system, developed by plant mechanics, allows the operator to see how well the wiper runs up and down the lamp shield when it’s out of the water. That makes it easier to spot and correct problems.

All told, Douglas estimates that ideas generated by operators and mechanics over the last several years add up to over \$5.6 million in total savings. “We have a union shop here, but we’re all on an equal plane,” he says. “Bureaucracies simply delay good ideas.”

**WORKING WITH ENGINEERS**

Besides employee participation, Douglas feels a key to success is communication between plant operators and the engineering consultant.

“As you plan a treatment process, it’s really important that you get your operators involved in the design,” says Douglas. “It may take longer to do it this way, but you’re much happier with the end result. Also, you get a more practical design that’s tailored to the specific operating conditions of the plant.”



A UV disinfection system from Trojan Technologies keeps plant effluent free of pathogens.

A major feature of the treatment plant is a Westinghouse distributed control system, which monitors and controls the facility. Special capabilities include controlling the speeds of the high-horsepower aeration and pumping equipment to prevent wasted energy. The computer system also controls the electrical generation system to reduce purchased-power costs. All large motors are powered from variable-frequency drives.

**EMPLOYEE POWER**

As much as electricity and gas, employee ideas power the York facility. “We used to have a formal employee suggestion program,” says Douglas. “While that got us started, it was too impersonal. I’d rather talk

to people and have people talk to me.”

Today, the plant uses an informal process of communication between management and staff that is as much a part of standard operating procedures as safety and environmental compliance. “We brainstorm a lot,” says Douglas. “We’re approachable. And we always let employees know what happened to their ideas. Basically, if it makes things easier or cuts costs, we’ll get

As examples, he mentions the skimmers on an old 145-foot-diameter clarifier. "No thought was ever given to the prevailing winds," he says, "so the wind hinders rather than helps move scum to the scum box."

Cleaning UV lamps is another. "Cleaning 728 bulbs by hand outdoors in the spring when it's 40 degrees is not very comfortable work," he says. "It wasn't very long before operators put up a simple greenhouse that requires no heat but keeps the lamp cleaning area warm and comfortable."

York is working with hometown firm Buehler Horn on the designs for coming upgrades. The engineering firm's Larry Lutter says meeting with operators and soliciting their ideas is standard procedure for his company.

"We meet with the York staff on a bi-monthly basis to see what's going on in the plant," he says. "Then we'll do our homework and come back with suggestions that might help make the operation smoother."

Lutter says operator input is critical when his firm designs a new project. "We sit down with the staff first and see what works, what doesn't, and what their needs are," he says. "The final design is based on their input." Lutter, who began his career as a certified operator, says not all ideas are practical from a cost standpoint, and there have to be some compromises. "But they are the people running the plant and making it work," he says.

### GET THE KIDS INTERESTED

The environment of candor and responsiveness may be one reason Douglas feels so strongly about the worth of the wastewater treatment profession, and its attractiveness to young people searching for a worthwhile career. He wrote to *TPO* magazine recently about the need for the profession to work harder to bring new blood into the business.

"It just took us 14 months to fill a vacancy for a plant operator II position," he says. One of the barriers is a local requirement that operators live

"We have a union shop here, but we're all on an equal plane. Bureaucracies simply delay good ideas."

STEVE DOUGLAS

**FILL**  
a job opening

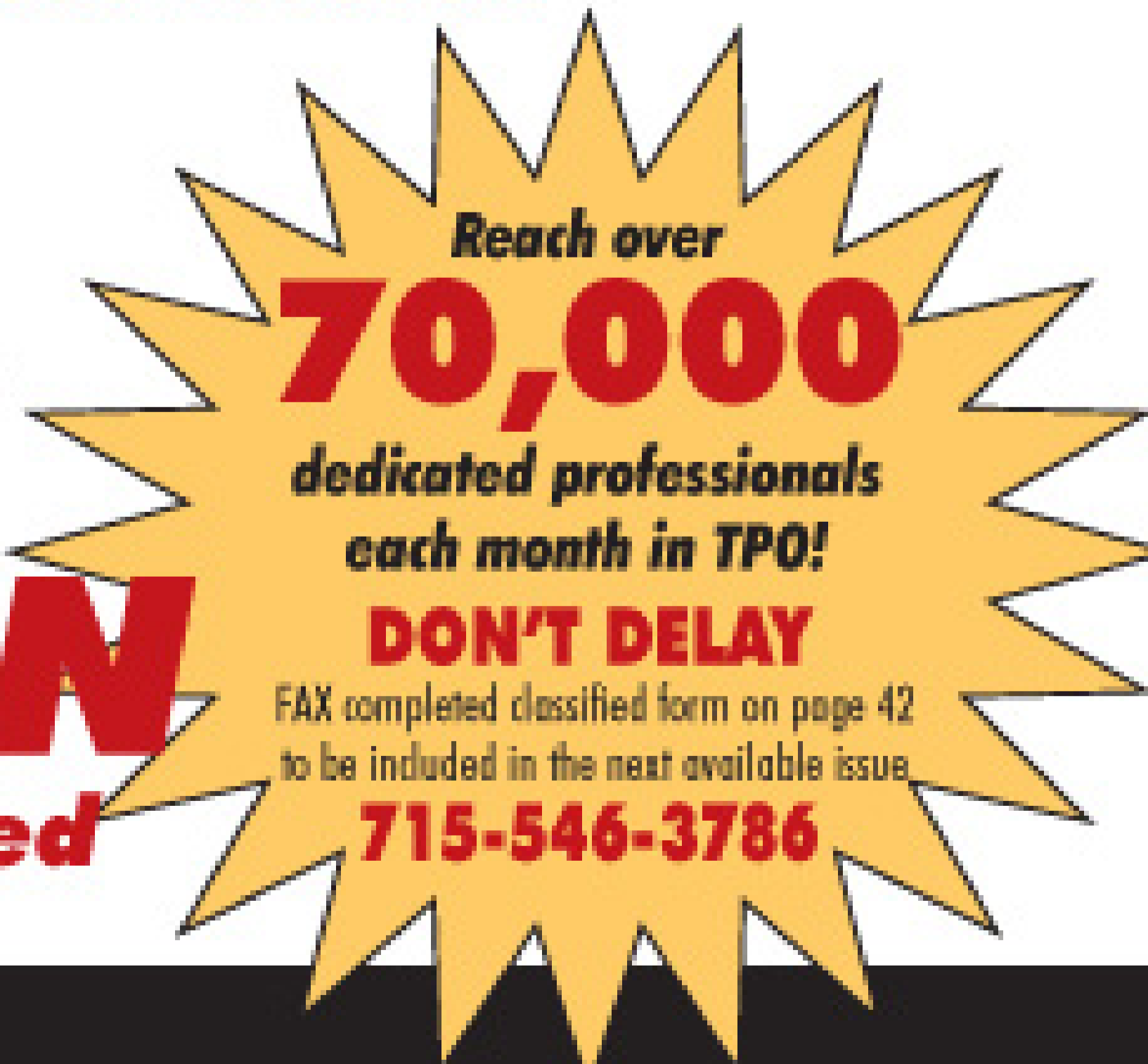
**BID OUT**  
an upcoming job

**ANNOUNCE**  
contracted services offered

**SELL**  
used equipment

**OBTAIN**  
a position wanted

**FIND** what you're looking for!



Reach over  
**70,000**  
dedicated professionals  
each month in TPO!  
**DON'T DELAY**  
FAX completed classified form on page 42  
to be included in the next available issue  
**715-546-3786**

## WHAT'S UP NEXT?

The City of York Wastewater Treatment Plant keeps changing to stay ahead of the times. The next upgrade, now taking place, is a \$10 million remodeling project that will add two new gravity belt thickeners to the solids handling system and replace roofs on the administration building and other structures.

The new thickeners will replace existing dissolved air flotation units and should increase the solids content of the feed into the digesters from 1.5 percent solids to around 4.0 percent. The change will result in a higher percent solids cake for land application, while increasing digester gas production and saving on solids handling costs.

Phase II, scheduled for 2010-11, will address the city's "Chesapeake Bay obligation," explains Steve Douglas, plant general manager. Under new U.S. EPA policies, all treatment plants in the Chesapeake Bay watershed must comply with new total maximum daily limits (TMDLs) for nutrient discharges.

At York, that will mean reconfiguring the biological treatment system to meet nitrogen removal requirements. The plant already meets phosphorus removal goals.

within the city limits. He says the rule might have made sense in the past, but today, prospective operators like to live in rural areas and be outdoors.

"It's an issue with us," he says. "We're an aging population. One-third of our people will be eligible for retirement in five years. There's going to be a void."

Douglas believes the profession is undersold. "It's a good job," he says, noting that treatment plant personnel earn good wages, have good benefits and job security, and gain the satisfaction of knowing they're doing something to protect water resources.

"You're outdoors a lot, or working with computers," Douglas says. "That's what makes it fun." When school students visit the plant, he often asks them if they've ever thought of working in a treatment plant. "No one raises their hand, and then we tell them, 'We never thought we'd be working here either, but we wouldn't trade the job for anything else.'"

"That's one of my goals over the next year or so — to get out into the schools, and tell them what we do and how much pride we have. Everything's going green right now. It's a good time to get the kids interested." **tpo**

### more info:

**Andritz Separation Inc.**  
817/468-3961  
www.andritz.com

**Caterpillar Inc.**  
390/675-1000  
www.cat.com

**Kato Engineering Inc.**  
507/625-4011  
www.kato-eng.com

**Kruger**  
919/677-8310  
www.krugerusa.com

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

**Synagro Technologies Inc.**  
800/370-0035  
www.synagro.com

**Trojan Technologies**  
888/220-6118  
www.trojanuv.com

**Westinghouse Electric Company**  
www.westinghousenuclear.com

# Not Just for Appliances Anymore

ENERGY STAR PROGRAM FOR TREATMENT PLANTS PROVIDES A GOOD START TOWARD AN ENERGY ACTION PLAN THAT CAN YIELD SUBSTANTIAL COST SAVINGS

By Lee E. Ferrell, P.E.

**E**nergy accounts for 28 percent of wastewater operations and maintenance budgets — the second largest expense for a treatment facility after labor.

That means cutting energy costs can have a dramatic effect on a municipality with a limited budget. The U.S. EPA estimates that a 10 percent reduction in energy usage could save the nation's water and wastewater treatment plants some \$400 million a year. Wasted energy directly affects plant operation and maintenance costs and contributes to greenhouse gas (GHG) emissions and concerns over global climate change.

In the near future, wastewater treatment plants will be able to qualify themselves under the ENERGY STAR program, jointly sponsored by the U.S. EPA and the U.S. Department of Energy. Already, treatment plants can track energy usage and compare themselves against plants of similar size by using an online Portfolio Manager tool.

The Portfolio Manager is a timely tool that plant managers and operators can use to help monitor and control energy usage and drive down operating costs. A more comprehensive approach to energy savings is to create and implement an energy action plan.

## ROUTES TO SAVINGS

Saving energy is both more complex and potentially more rewarding than many plant managers imagine. The biggest savings opportu-

nities are in aeration and pumping. This includes aeration for the activated sludge process and aerobic solids digestion, pumping of return and waste activated sludge, and operation of lift and influent pump stations.

In a 2006 *EPRI Journal* article, "Turning on Energy Efficiency," B. Barker and L. Sanna identify three basic kinds (or waves) of energy savings:

**Energy efficiency.** This involves improvement in equipment efficiencies, such as installation of NEMA Premium or EPAct high-efficiency motors and variable-frequency drives, more efficient solids dewatering systems, high-efficiency lighting fixtures, lighting controls, and modern HVAC equipment and controls. These measures typically can achieve five to 10 percent energy savings.

**Demand response.** This involves adjusting operations to take the best advantage of utility rate structures. It includes measures such as shedding load during higher-priced on-peak periods and shifting load to lower-priced off-peak periods. Specific measures may include control of lighting and HVAC systems with demand-response systems, use of the facility's most efficient pumps and blowers during on-peak hours, and use of equalization basins to enable shifting of some treatment load to off-peak times. These measures can reduce energy usage by 10 to 20 percent.

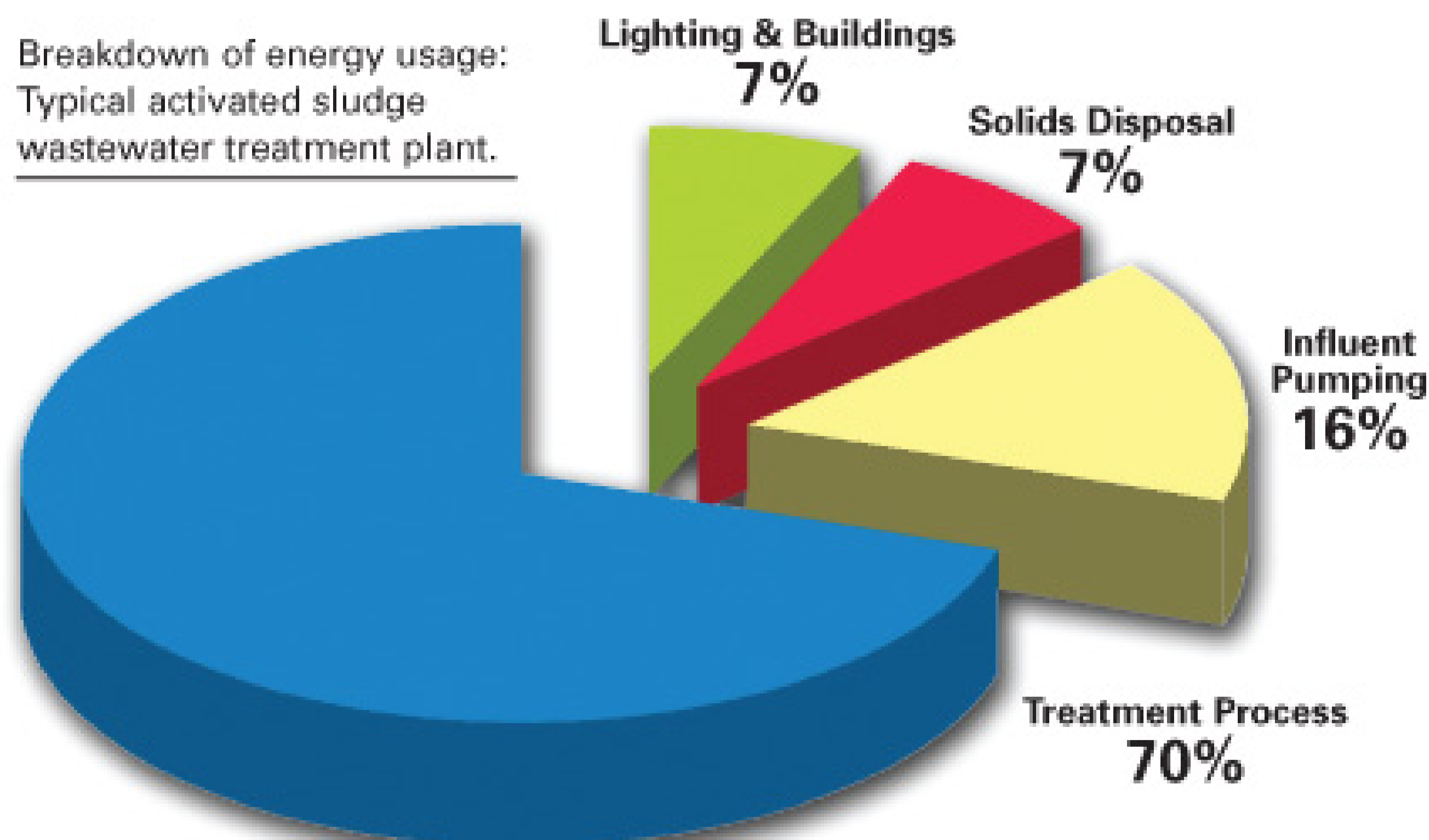
**Dynamic systems.** This holistic approach to energy management — which can achieve energy savings of 20 percent or more — combines energy efficiency measures with demand response using intelligent and automatic monitoring and control systems. Dynamic systems integrate a communication network with smart end-use devices and innovative rate structures, systems and processes to conserve energy.

This approach can include process optimization using multi-variable control systems with predictive and dynamic modeling capability. For example, such a system might automate control of the activated sludge process based on measurement of dissolved oxygen and other variables, enabling staff to optimize blower efficiency while maintaining tight control of effluent quality.

Another potential source of major savings is the use of digester methane for heating, power generation, cogeneration, or peak shaving. Although these approaches are common and long accepted, many treatment plants still flare off excess methane.

## ENERGY ACTION PLAN

Energy-saving initiatives are most effective when organized around an energy action plan (EAP). The first step in an EAP is to conduct an



Source: O'Connor, K. (2007). "Improving Energy Efficiency of Your Municipal Treatment Facility."

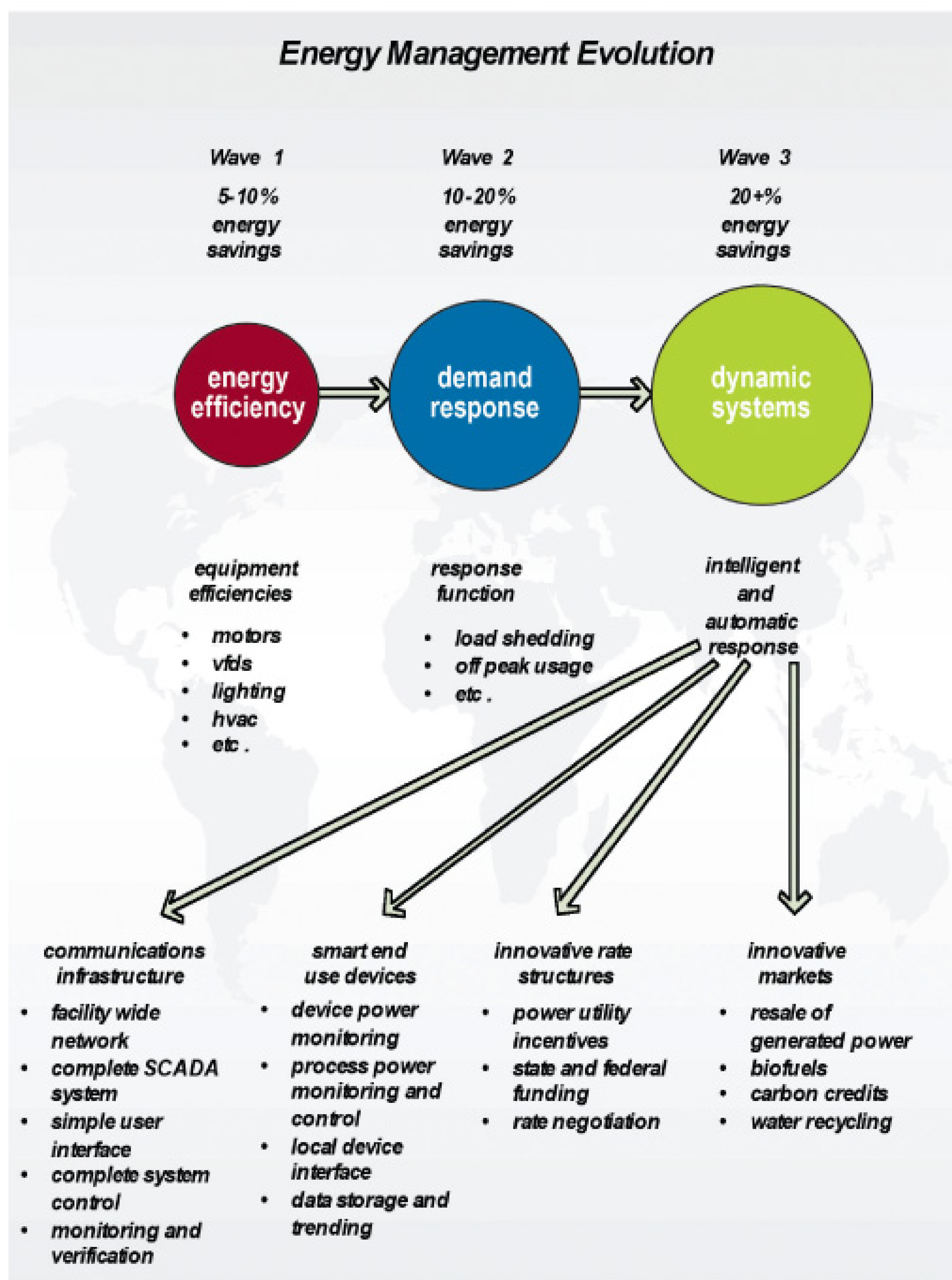
## GETTING HELP

A variety of government grants and incentive programs are available to support energy efficiency initiatives. Among them is The Energy Efficiency and Conservation Block Grant Program, funded for the first time under the American Recovery and Reinvestment Act (ARRA) of 2009, better known as the economic stimulus program.

The program aims to support deployment of energy efficiency and conservation — the cheapest, cleanest, and most reliable energy technologies available — across the country. It is modeled after the Community Development Block Grant program administered by the Department of Housing and Urban Development (HUD).

Grants are intended to help cities, counties, states, territories, and Indian tribes develop, promote, implement, and manage energy efficiency and conservation projects that reduce fossil fuel emissions, reduce total energy use, and create and retain jobs.

Through formula and competitive grants, the program empowers communities to make strategic investments to help meet the nation's long-term goals for energy independence and leadership in climate change. Funding totals \$3.2 billion. **To find out more about the block grants, visit [www.eecbg.energy.gov](http://www.eecbg.energy.gov).**



There are three basic kinds (waves) of energy efficiency improvement.

energy audit using steps similar to those outlined in the accompanying table. Basic audit steps include:

- Kickoff meeting with plant personnel.
- Evaluation of utility bills and rate schedules.
- Review of requirements for federal, state and local grants and incentives for energy conservation measures.
- Collection of data on historic plant operations and energy consumption.
- Field investigation to inventory plant equipment and determine each device's energy usage and time-of-day operation.
- Development of energy conservation measures and strategies for implementation.
- Monitoring and follow up.

The finished EAP includes an action plan to deploy the conservation measures, and ways to monitor the plant's performance and keep staff accountable for progress.

Detailed guidelines for energy audits are available in two publications: *The Energy/Audit Manual for Water/Wastewater Facilities*, published by the Electric Power Research Institute (1994) and *Energy Conservation in Wastewater Treatment Facilities*, published by the Water Environment Federation (1997).

## BEING A STAR

The ENERGY STAR program can be used as part of an EAP to develop a baseline with other similar wastewater treatment plants. ENERGY STAR, first conceived for consumer goods like household appliances, is designed to help save money and protect the environment through energy-efficient products and practices.

Today, the program helps measure and recognize energy efficiency in specific market segments. The EPA estimates that with the help of ENERGY STAR, Americans prevented 40 million metric tons of greenhouse gas emissions in 2007 alone, equivalent to the annual emissions from 27 million vehicles and a savings of more than \$16 billion in utility bills.

Municipal wastewater facilities were added to the program in October 2007 with introduction of the online Portfolio Manager (visit [www.energystar.gov](http://www.energystar.gov)). The tool creates a standardized approach to tracking energy usage. It lets plant personnel use a common plat-

form to input plant-specific energy data, establish a baseline for energy efficiency performance, measure their performance over time, and compare their performance to other treatment facilities.

So far, the program is limited to plants that use some form of the activated sludge process. Plants that use trickling filters or nutrient removal are not included because their processes are too different for meaningful comparison. In using the Portfolio Manager, plant personnel enter:

- Facility ZIP code (to normalize for weather)
- 12 months of energy use data for all fuels, by month

- Annual average daily influent flow
- Annual average influent BOD
- Average effluent BOD (12 months)
- Facility design treatment capacity

Users can enter data directly into an online account, or download a spreadsheet, enter data into it, and e-mail it for upload into the tool.

Besides helping facilities monitor energy consumption and measure performance, the Portfolio Manager calculates the impact of the plant on GHG emissions based on energy usage. The tool provides data that facilities can use to quantify improvements and share success stories with their communities. In the future, the program will include ENERGY STAR ratings for outstanding treatment plants, just as it does now for hospitals, schools, universities, and other facilities.


## GETTING TO WORK

Almost all wastewater treatment plants can reduce their energy consumption — in many cases substantially. A detailed energy audit and energy action plan are the first steps in any energy efficiency program. Monitoring and automation and control systems have especially high potential to help facilities manage energy effectively. Now is the time for treatment plants to decide how they can make the most of their energy to cut operating costs, better manage resources, and reduce pollution. **tpo**

## ABOUT THE AUTHOR

*Lee E. Ferrell, PE., is a water wastewater energy and process consultant with the Water Wastewater Competency Center of Schneider Electric, a manufacturer of power and automation control systems with United States headquarters in Palatine, Ill. He can be reached at [Lee.Ferrell@us.schneider-electric.com](mailto:Lee.Ferrell@us.schneider-electric.com).*

35,000 MUNICIPAL AND UTILITY MAINTENANCE PROFESSIONALS READ IT EVERY MONTH. DO YOU? **MUNICIPAL SEWER & WATER**  
A subscription is FREE. [www.mswwmag.com](http://www.mswwmag.com) or 800-257-7222



Have you seen the **tpo** E-Zine?  
Go to [tpomag.com](http://tpomag.com) to view the e-zine.

## Clean Power. Customized and Ready for Use. SOLON Turnkey Solar Solutions for Wastewater Treatment Plants.

Premium quality  
Made in USA

With years of experience in developing power plant solutions, our turnkey solar power plants are designed to maximize kWh with the fastest realization of solar electricity.

Put our extensive know-how to work: from planning and construction to startup and maintenance of your solar power plant, you can rely on us.

[www.solon.com](http://www.solon.com)

Don't leave the planet  
to the stupid  
**SOLON**

SOLON Corporation • 6950 S. Country Club Road, Tucson, AZ 85756 • P: 520-647-8754 • [patricia.browne@solon.com](mailto:patricia.browne@solon.com)

# LEADERSHIP THROUGH SERVICE

AS CHIEF OPERATOR AT THE SHOAL CREEK WATER RECLAMATION FACILITY,  
JIMMY STEWART GUIDED HIS TEAM THROUGH TWO MAJOR PLANT UPGRADES

By Ted J. Rulseh

JAMES R. (JIMMY) STEWART ENTERED THE WASTEWATER TREATMENT PROFESSION for a simple, practical reason.

"The economy was bad in the early 1980s, and I needed a job," he says. He joined the Clayton County (Ga.) Water Authority in 1982 as an operator at what is now the Northeast Water Reclamation Facility.

By 2000, he had earned his Class I Wastewater license and had worked his way up to chief operator at the authority's 4.4-mgd Shoal Creek Water Reclamation Facility. That plant is part of an innovative and advanced system that treats wastewater and recycles it back to the drinking water supply (see sidebar).

At Shoal Creek, Stewart earned recognition for leading his team through major upgrades to the liquids and solids sides of the process.

In 2008, the Georgia Association of Water Professionals (GAWP) honored Stewart as Top Operator for District 3, which covers the north central part of the state near the Atlanta metropolitan area. In March 2009, the Water Environment Federation named him one of its Water Heroes — professionals who "protect public health and the environment by cleaning the world's water day after day." The plant itself has received the GAWP Platinum Award for 12 years of full compliance with its NPDES permit.

Stewart enjoys the recognition, but credits the members of his staff at Shoal Creek. "It was a good crew of operators who pulled together as a team," he says. "They wanted to be involved in the process, and it was really fun brainstorming with them and trying to figure out the different challenges we were facing. Any awards or recognition that I am receiving come from working with a great group of people."



Jimmy Stewart served for eight years as chief operator at the Shoal Creek Water Reclamation Facility, then stepped down and returned to an operator's role. While chief operator, he focused on leading his team and building their skills. (Photography by Harris Hatcher)

## WINDING ROAD

Stewart voluntarily stepped down last year as chief operator and instead works the night shift as an operator at Shoal Creek. He looks back with great satisfaction on his eight years of leadership. He is especially proud that four operators earned their Class I licenses — the highest level in Georgia — during his tenure.

It was by no means a direct path that led Stewart to his current position. After high school, he worked in the hotel industry and tried his hand at electrical work before taking a job with the CCWA. He took his training at the authority's expense through the Georgia Water & Wastewater Institute, a subsidiary of the Georgia Association of Water Professionals.

He worked at what is now the Northeast facility until the early 1990s, when he decided to try selling cars. "I started selling Lincoln Town cars, but it didn't work out," he recalls. "They told me I was too honest to be a car salesman. And then the economy went south again, so I had to regroup, and I was able to go back to work at Clayton County Water.

"I left again in the mid-1990s for some work in downtown Atlanta with a ministry group that helped the homeless. After a short time, I had to regroup again, because I needed to feed my family." Once again he returned to CCWA.

Stewart was working the second shift at the WB. Casey Treatment Plant in 2000 when the chief operator at Shoal Creek decided to step down. "He asked for my position on the second shift," Stewart says. "The department manager put me at Shoal Creek as acting chief operator. I got my Class I license that first year, and I've been here ever since."



# profile



## James R. (Jimmy) Stewart, Shoal Creek Water Reclamation Facility, Clayton County (Ga.) Water Authority

POSITION: Chief operator (2000-08)

EXPERIENCE: 24 years

CERTIFICATION: Georgia Class 1  
Wastewater license

AWARDS: 2009 WEF Water Hero,  
2008 Top Operator Award,  
District 3, Georgia Assoc.  
of Water Professionals

Stewart takes a clarifier  
blanket reading.

“Every wastewater treatment plant has its own characteristics — its own personality, if you will. The books give you a wide window of parameters that could work. Then you have to fine-tune it to get it to operate at its optimum performance.”

JAMES R. (JIMMY) STEWART

The Shoal Creek plant has undergone major upgrades to its liquid and solids processes during Stewart's tenure.

Constructed wetland cells provide a final treatment step for effluent from the Shoal Creek Water Reclamation Facility.

### Shoal Creek Water Reclamation Facility (PERMIT AND PERFORMANCE)

	PERMIT (MONTHLY AVG.)	ACTUAL
<b>BOD</b>	10 mg/l	1.4 mg/l
<b>TSS</b>	30 mg/l	3 mg/l
<b>Total Phosphorus</b>	2 mg/l	0.26 mg/l
<b>Ammonia N</b>	4 mg/l May-Oct 8 mg/l Nov-Apr	0.12 mg/l
<b>Fecal coliform</b>	100/100 ml	4/100 ml



### ADAPTING TO CHANGE

It wasn't long before Stewart faced his first big challenge: The authority upgraded the Shoal Creek facility from a pair of simple package extended aeration plants with 2.2-mgd capacity to an advanced 4.4-mgd (design) facility with an entirely different process.

The current facility uses the Schreiber continuous sequencing reactor (CSR) to achieve biological nutrient removal.

In essence, the process "constantly tortures the bugs in one tank," Stewart observes. It uses a single, round, 2.6-million-gallon aeration basin with a bridge that rotates around it, constantly agitating the mixed liquor. The bridge carries air headers with a fine-bubble diffuser. Automation turns the flow of air on and off to create alternating aerobic, anoxic and anaerobic conditions.

The system achieves a high degree of nitrogen, phosphorus, BOD and TSS removal, all without chemicals. "We have the capability to add ferric sulfate to remove phosphorus and to seed the system with acetic acid," says Stewart. "However, we've found that we can keep all the offending nutrients well below our permit requirements with no chemical addition."

Of course, adapting to the system wasn't always easy. "During construction and startup, it fell to me as the chief operator to learn how to operate all the new technology and process controls," says Stewart. "Then as I learned, I had to teach the other operators."

"My philosophy is to lead through service. As the chief operator, I figured out the technical manuals and translated them for the operators. The O&M manuals are normally written by engineers, so you have to dig through a lot of material to find the meat.

"In addition, every wastewater treatment plant has its own characteristics — its own personality, if you will. The books give you a wide window of parameters that could work. Then you have to fine-tune it to get it to operate at its optimum performance.

"Instead of just making all the decisions in a dogmatic way, I would involve the other operators who were interested. We would talk about the process, and we would brainstorm about different problems we were having. If an operator had an idea how to make a certain aspect of the operation run better, we would try it and see."

### THE SOLIDS SIDE

In 2005, the team faced another test: adapting to a new solids process. The newly upgraded treatment plant used aerobic digestion followed by gravity thickeners to prepare biosolids for spray application to a 20-acre hay field, but that field was reaching the end of its useful life, and the authority decided to produce cake biosolids for composting.

### FULL CIRCLE

Treated water from the Shoal Creek Water Reclamation Facility eventually winds up flowing back through the faucets of homes in Clayton County.

After disinfection in a UV system (Trojan), plant effluent is pumped about a mile to the Panhandle Road Constructed Wetlands, where it is further purified in a series of wetland cells. After the last cell, it enters a clear well, from which it is pumped to one of the CCWA raw-water reservoirs. Water from the reservoir is in turn treated at the 12-mgd J.W. Smith Water Production Plant before being fed into the water distribution system.

The CCWA uses a surface water system, which means water production begins with the collection of rainfall that hits the surface and drains into one of five reservoirs. The authority also can withdraw raw water from the Flint River, which flows through the heart of the county. In total, the CCWA can produce up to 42 mgd of clean drinking water at its three water production plants.

"It was a good crew of operators who pulled together as a team. Any awards or recognitions that I am receiving come from working with a great group of people."

**JAMES R. (JIMMY) STEWART**

"We built a new solids handling facility and installed two Andritz centrifuges," says Stewart. "Again, I was there to start up the facility and train the other operators. At the end, everybody in the plant knew how to operate that facility.

"The manual for the centrifuges said they wanted a feed concentration of three percent solids. About the best we could get out of the gravity thickeners was 1.6 to 1.7. The operators on the different shifts would come up with ideas on how to manipulate the thickeners so that we could have good-quality feed solids to the centrifuges."

A key to the solution was mixing the biosolids with waste alum sludge from the nearby J.W. Smith Water Production Plant — a material the Shoal

Creek plant was already responsible for handling.

"The alum sludge was a thicker material," says Stewart. "Most of the time it was in the three percent solids range. We wound up blending the two sludges and dewatering them together.

"The Andritz centrifuges are a very good, forgiving system. Through trial and error, we found that if we blended 75 percent biosolids and 25 percent alum sludge that gave us a good, consistent product. We were able to produce 22 to 23 percent cake solids, and the system ran very smoothly." Today, the finished product is sent to a private contractor for composting off site.

#### PROUD OF THE TEAM

Looking back on challenges like those, Stewart remains grateful to the team who worked with him during his eight years as chief operator. They included Curtis Price (Class D) then plant supervisor and now retired; day shift operators Lenny Clupper (Class D), now chief operator, and Tony Head (Class III); second shift operators Manuel Igbokwe (Class II) and Eddie Lane (Class D) retired; and midnight shift operators Billy Sumner (Class D) and Jody Pollock (Class D).

"It was great to work with such fine people," Stewart says. "The wastewater business is challenging because you never know what's coming down the sewer line. You're dealing with live bacteria. You have to keep everything balanced and in tune so the microorganisms can do their job properly.

"You've got to keep the bugs happy and all the equipment well maintained. It's good, steady work. And then every once in a while you get surprised with an award, or you wind up on an international Web page as a Water Hero." **tpo**

#### more info:

**Andritz Separation Inc.**  
817/468-3961  
www.andritz.com

**Schreiber LLC**  
205/655-7466  
www.schreiberwater.com

**Trojan Technologies**  
888/220-6118  
www.trojanuv.com



**GOT SLUDGE??**  
Dewatering Solutions  
Get Real Answers!

Call Today for More information!!

800-253-0532



RENT  
LEASE  
PURCHASE

Trailer Mounted Units, Skid Mounted Units

Versed in:

Primary & Secondary Waste, Aerobic & Anaerobic Waste, SBR & MBR Waste Applications.

Gypsum, Fly Ash and related slurries

Lime & Alum Sludge

**Stainless Steel Construction**

**Belt Filter Presses  
Tailored to Your  
Application.**

Steel Industry  
Food Processing  
Beverage Plants  
Power Generation  
Aggregate & Mineral  
Septage /Grease Trap

Bright Technologies --127 N. Water St. Hopkins, MI 49328

www.brightbeltpress.com

P- 269.793.7183----- F- 269.793.4022

MADE IN HOPKINS, MICHIGAN USA

# One Complete Package

promonthly.com

cleaner.com

pumper.com

mswmag.com

onsiteinstaller.com

pumpershow.com

pumpertrader.com

eq-mag.com

**tpomag.com**

septicyellowpages.com

sewerpages.com

**COLE Publishing**

**1.800.257.7222 | 715.546.3346**

# A Better Way

SANFORD SOUTH WATER RESOURCE CENTER  
INSTALLS A GASIFIER THAT PROVIDES  
ENVIRONMENTALLY FRIENDLY BIOSOLIDS  
HANDLING AND SUBSTANTIAL ENERGY SAVINGS

By Mike Grennier

**A** new gasification system at the Sanford South Water Resource Center (WRC) in Sanford, Fla. is far ahead of the curve in biosolids management. It uses a new gasification technology that is expected to save up to \$13 million on natural gas in the next 20 years.

It's all part of the city's forward-thinking philosophy. "Biosolids have always been a concern," says utility director Paul Moore who oversees the 2.0-mgd advanced secondary treatment facility. "We've asked ourselves, 'Is there another way we can address it and be environmental stewards?' So far, we think the path we've chosen is a pretty good one."

## GOING TO GASIFICATION

The startup of the gasification system in May follows earlier efforts to stay on top of environmentally friendly biosolids management in central Florida. In 2008, the city installed an indirect, batch biosolids dryer at the Sanford South WRC to meet Class AA standards established by the Florida Department of Environmental Protection (FDEP).

The biosolids dryer greatly reduces the amount of material to be managed. It converts about 32 tons of wet biosolids per day into a



The MaxWest gasification system at the Sanford (Fla.) South Water Resource Center is shown with the enclosure under construction.

PHOTO COURTESY OF MAXWEST ENVIRONMENTAL SYSTEMS INC.

Systems Inc., which designs, builds, owns, and operates waste-to-energy gasification facilities throughout North America. MaxWest installed a gasification system that transforms the dry materialized biosolids to volatile syngases and a mineralized ash suitable for use as a soil amendment. The ash can also be used for commercial applications or landfilled.

## COST AVOIDANCE

The gasification system has been used in a number of energy-intensive industries but is new to municipal wastewater treatment. MaxWest supplied the capital to build the system and took responsibility for operation and maintenance. Under a 20-year contract, the city pays MaxWest about \$280,000 per year, with an annual three-percent increase.

During the next 20 years, the city expects to save \$8 to \$13 million by avoiding escalating natural gas prices. It plans to save more by avoiding the expense of hauling biosolids to the land application site.

"We looked at projections for natural gas costs and we saw that it was going to have a significant impact on the utility budget, and the city had no control over it," says Benjamin Fries, vice president of

"We looked at projections for natural gas costs and we saw that it was going to have a significant impact on the utility budget, and the city had no control over it."

**BENJAMIN FRIES**

dried, reusable product at about 93 percent dry solids. The amount processed includes biosolids transported in from the city's other treatment plant (7.3-mgd capacity).

Yet despite the reduction in volume, city officials felt a need to do more, since all signs point toward stricter biosolids regulations. The city also wanted to address the rising cost of natural gas, the main fuel for the indirect batch drying system. Gas to process the biosolids at Sanford South cost about \$280,000 in 2008.

The city considered a variety of options before turning to MaxWest Environmental

CPH Engineers Inc., which designed and built the Sanford South WRC and was the lead engineer for the gasification system design.

The system is a win-win because it eliminates greenhouse gases like carbon dioxide and nitrous oxide that are emitted when the material decays. The gasification process also reduces the city's carbon footprint, and addresses potential groundwater and air pollution associated with the land application. Additionally, it eliminates air emissions from the transportation of biosolids.

## CAPTURING ENERGY

In the gasification process, dry and wet biosolids are first routed to a wet/dry storage hopper, where they are mixed and blended in

## 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](mailto:editor@tpomag.com) or call 877/953-3301.



PHOTO COURTESY OF CPH ENGINEERS INC.

“The gasifier costs us no more than it did to purchase natural gas each year, so it’s a no-brainer. MaxWest knows how the gasifier works. I just know it’s supposed to work and save us money.”

**PAUL MOORE**

The gasification system converts biosolids into thermal energy, which offsets the facility’s need for natural gas.



PHOTO COURTESY OF MAXWEST ENVIRONMENTAL SYSTEMS INC.

### THE RIGHT PATH

So far, the gasification system has met the city’s expectations. Moore says the decision to install the gasifier was relatively easy given the savings and an arrangement that puts the responsibility for performance on MaxWest. “The gasifier costs us no more than it did to purchase natural gas each year, so it’s a no-brainer,” he says. “MaxWest knows how the gasifier works. I know it’s supposed to work and save us money.”

Although it has only been seven months since startup, Moore says the decision to install a gasification system appears to be the right one. “We’ll know for sure in about another year,” he says. “I think we’re on the right path.” **tpo**

### more info:

**CPH Engineers Inc.**  
407/425-0452  
www.cphengineers.com

**MaxWest Environmental Systems Inc.**  
800/730-1143  
www.maxwestenergy.com

The gasification process reduces the city’s carbon footprint and addresses potential groundwater and air pollution associated with the land application. It also eliminates air emissions from the transportation of biosolids.

the proper proportions to generate the appropriate feedstock stream.

The feedstock then goes into a ceramic-lined primary gasifier chamber. In the oxygen-starved, temperature-controlled environment of the gasifier, the feedstock is converted into a uniform mixture of syngases (carbon monoxide, hydrogen, and methane). The ash settles to the bottom of the chamber, where it is skimmed into a discharge chute and conveyed to a dump container.

The syngases are routed to a thermal oxidizer, where they are converted into a low-nitrous-oxide gas stream. In the thermal oxidizer, the syngases are reacted in four stages and converted to thermal energy in the form of hot air. This air then enters a diversion stack at 1,600 degrees F and is further routed to a dropout box/heat exchanger.

The heat exchanger captures the thermal energy in a thermal fluid, which is returned to the dryer at 450 degrees F to dry the wet biosolids. The cooled thermal fluid leaving the dryer is recirculated back to the heat exchanger. Excess thermal energy is routed to a cooling tower that brings the temperature down to below 100 degrees F. The cooled air is then reintroduced to the diversion stack, where it is vented to the atmosphere with no visible steam plume.

Each day, the system produces about 200 pounds of ash, which is landfilled. The city is working with the University of Central Florida to test its suitability as a soil amendment. In addition, the city hopes to create a new revenue stream by processing wet biosolids from other municipalities. The drying and gasification system is rated to process up to 55 wet tons of material per day.

About that article,  
would you like a copy?

A poster to display in your office?

An electronic file to post on your web site?

Reprints to hand out or mail to potential customers?

Just let us know!

View articles, options and pricing  
at [www.tpomag.com/editorial](http://www.tpomag.com/editorial)

To order, e-mail  
[jeffl@colepublishing.com](mailto:jeffl@colepublishing.com)  
or call COLE Publishing  
at 800-257-7222





CELEBRATING **30** years 1981 - 2010

# EDUCATION DAY

Wednesday, February 24th, 2010

## SOUTHERN SECTION COLLECTION SYSTEMS COMMITTEE

### ROOM C204-C205 - SSCSC

- 8:00 - 9:00 Manhole Inspections 'The Need'
- 9:30 - 10:30 Combination Truck Maintenance and Safety, Sewer Hose Maintenance and Nozzle Technology
- 11:00 - 12:00 Jetting Nozzles - Their Design, Technology and Effective Usage
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Elevating the Quality of Your CCTV Inspection Program
- 2:30 - 3:30 Critical Steps in Prioritizing Sewer Rehabilitation
- 4:00 - 5:00 Traffic Control - The Critical Factor in Pipeline Inspection

## NATIONAL ENVIRONMENTAL HEALTH ASSOCIATION

### ROOM C105-C108 - NEHA

- 8:00 - 9:00 Decentralized Systems - The Next Wave in Our Industry
- 9:30 - 10:30 Septic Tanks: A Gift That Keeps on Giving
- 11:00 - 12:00 Selling CIOWTS Certification to Installers and Regulators
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Softeners and Onsite Systems
- 2:30 - 3:30 Advanced Wastewater Treatment Systems
- 4:00 - 5:00 Maximize Efficiency by Working Closely with Regulators and Within the Regulatory System

## NATIONAL ASSOCIATION OF WASTEWATER TRANSPORTERS

### ROOM B101-B102 - NAWT

- 8:00 - 9:00 Sampling Protocols and Methods for Alternative Technologies
- 9:30 - 10:30 Dealing with Restaurant or High-Strength Waste
- 11:00 - 12:00 O & M for ATUs
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 O & M for Drip Irrigation
- 2:30 - 3:30 What to Expect When the EPA Comes A-Callin'
- 4:00 - 5:00 A Template for Keeping Your Employees Trained

## NATIONAL ASSOCIATION OF SEWER SERVICE COMPANIES

### ROOM C101-C104 - NASSCO

- 8:00 - 9:00 Pipe Inspections without an Operator?
- 9:30 - 10:30 Ways to Increase Your Daily Sewer Cleaning Production Rates without Increasing Your Costs
- 11:00 - 12:00 Proper Preparation of the Substrate Results in Coating Longevity
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Collection System Asset Management - Getting from Reactive to Proactive
- 2:30 - 3:30 Trenchless Lateral Renewal Technologies - Lessons to be Learned
- 4:00 - 5:00 Zoom Camera Technologies: The Next Level of Infrastructure Inspection

## WATERJET TECHNOLOGY ASSOCIATION

### ROOM C203 - WJTA

- 8:00 - 9:00 The Impact of OSHA's Combustible Dust National Emphasis Program on Industrial Vacuuming
- 9:30 - 10:30 Waterblast Safety
- 11:00 - 12:00 Waterjet Applications and Business and Financial Considerations

## PORTABLE SANITATION ASSOCIATION INTERNATIONAL

### ROOM C203 - PSAI

- 1:00 - 2:00 Understanding Your True Cost Analysis to Ensure Profitability - Part 1
- 2:30 - 3:30 Understanding Your True Cost Analysis to Ensure Profitability - Part 2

## LEADERS RESOURCE NETWORK

### ROOM C201-C202 - LRN

- 8:00 - 9:00 Creating Your Vision for Success
- 9:30 - 10:30 Getting Your Team On Board
- 11:00 - 12:00 Working Effectively in a Family Business Culture
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Creating Your Own Competitive Edge
- 2:30 - 3:30 Winning More Sales
- 4:00 - 5:00 Women in Business: Panel Discussion

## NATIONAL ONSITE WASTEWATER RECYCLING ASSOCIATION

### ROOM B103-B104 - NOWRA

- 8:00 - 9:00 Wastewater Characteristics
- 9:30 - 10:30 Soils and Site Evaluation Overview
- 11:00 - 12:00 Septic Tank Overview: Function, Design, Construction, Inspection and Troubleshooting
- 12:00 - 1:00 **LUNCH BREAK**
- 1:00 - 2:00 Seminar on Aerobic Treatment Units
- 2:30 - 3:30 Seminar on Media Filters
- 4:00 - 5:00 Seminar on Pumps and Controls

## SCOTT HUNTER

### ROOM C109-C112

- 9:30 - 10:30 Relationship is the Key!
- 11:00 - 12:00 The Art of Customer Service
- 12:00 - 1:00 **LUNCH BREAK/BOOK SALES**
- 2:30 - 3:30 Creating an Outrageously Successful Company - Part 1
- 4:00 - 5:00 Creating an Outrageously Successful Company - Part 2



Honored by Tradeshow Week as One of the 200 Largest Tradeshows in the U.S.



## THURSDAY

February 25th, 2010

### BUSINESS TRACK ROOM C101-C104

- 8:00 - 9:00 New 4 P's of Marketing  
*Jerard Nighorn/Lenzyme Trap-Clear Inc.*
- 9:30 - 10:30 Quit Learning and Start Doing  
*Bill Raymond/Nexstar Network*
- 11:00 - 12:00 5 Secrets of Winners  
*Kenny Chapman/Nexstar Network*

### INSTALLER TRACK ROOM B102

- 8:00 - 9:00 Risk Assessment for Determining SVC Frequency  
*Colin Bishop/Bord na Mona*
- 9:30 - 10:30 From Theory to Reality  
*Roger Lacasse/Premier Tech*
- 11:00 - 12:00 Timed Dosing and Controls  
*Mark Gross/Orenco*

### LIQUID WASTE TRACK ROOM B103

- 8:00 - 9:00 Understanding the Biology and Function of an ATU  
*Doug Dent*
- 9:30 - 10:30 Permit Required Confined Space  
*Ed Fitzgerald/Jack Doheny Co.*
- 11:00 - 12:00 T.B.D.

### PORTABLE TOILET TRACK ROOM B104

- 8:00 - 9:00 Up-Selling: How to Thrive During a Recession  
*Ray Luden Jr./PolyJohn*
- 9:30 - 10:30 Portable Sanitation Business Overview  
*Deric Boggs, Phil LaRoche/Satellite*
- 11:00 - 12:00 T.B.D.

### MUNICIPAL TRACK ROOM C105-C108

- 8:00 - 9:00 Pipe Cleaning Tools  
*Dana Hicks/ENZ USA Inc.*
- 9:30 - 10:30 Increase Revenues through Pipeline Laser & Sonar  
*Doc Bennet/CUES*
- 11:00 - 12:00 How to Prevent I/I in the Manhole Chimney Area  
*William Goff/Sealing Systems Inc.*

### SPANISH TRACK ROOM C109-C112

- 8:00 - 9:00 Limpieza de Drenajes y Tuberías y la Elección de Boquillas  
*Jim Aanderud/SSCSC*
- 9:30 - 10:30 Formando un Programa Eficaz de Inspecciones CCTV  
*Jim Aanderud/SSCSC*

### WOMEN IN THE INDUSTRY ROOM C203

- 9:00 - 12:00 The Regeneration Process: How to Re-energize, Re-purpose, Re-invent and Handle Everything!  
*Ann Fry*

## FRIDAY

February 26th, 2010

### MUNICIPAL TRACK ROOM C105-C108

- 8:00 - 9:00 Identifying Manhole I/I Sources and Cost-Effective Repair Methods  
*Lee Haessig/Cretex Specialty Products*
- 9:30 - 10:30 Jet Up! Taking Science to the Sewer  
*Scott Paquet/NozzTeq Inc.*
- 11:00 - 12:00 Cured in Place Pipe vs. Digging and Replacing  
*Travis Bohm/Perma-Liner*

### BUSINESS TRACK ROOM C101-C104

- 8:00 - 9:00 Quality and the True Cost of Ownership  
*Matt Sutton/Rapid View*
- 9:30 - 10:30 Vision and Direction: Leading your Service Company to Prosperity  
*Victoria Finley/One Biotechnology*
- 11:00 - 12:00 How to Shop Your Insurance Effectively  
*Mark Herring/Heffernan Insurance*

### INSTALLER TRACK ROOM C109-C112

- 8:00 - 9:00 Safety in Excavation  
*Gary Hooks/Safety Corporation of America*
- 9:30 - 10:30 Comprehensive Control Panel Training  
*Joe Zimmerman, Scott Rietsema/SJE Rhombus*
- 11:00 - 12:00 Onsite Wastewater Effluent Disinfection  
*Jim Cruver/Salcor*

### LIQUID WASTE TRACK ROOM B103

- 8:00 - 9:00 Dewatering Alternatives  
*Kelly Brown/BDP Industries*
- 9:30 - 10:30 Convert a Liability to an Asset  
*Emily Landsburg/Black Gold Biofuels*
- 11:00 - 12:00 The Role of Bacteria and Bioaugmentation in Grease Traps and Septic Systems  
*Dr. Clarence Baugh/Custom Biologicals*

### SEWER & DRAIN TRACK ROOM B102

- 8:00 - 9:00 Drain Cable Technology and Their Real World Applications  
*Keith Nesky/Spartan Tool*
- 9:30 - 10:30 OSHA Procedures Regarding Confined Space  
*Chris Cira/M Tech*
- 11:00 - 12:00 Sonde and Utility Line Locating Techniques  
*Rob Trefz/RIDGID*



**ONSITE INSTALLER COURSE ROOM B101**

**COLE Publishing's Onsite Installer™ Course**  
ALL DAY THURSDAY  
8 a.m. - 5 p.m.  
*Jim Anderson and Dave Gustafson*



For detailed seminar information please visit [www.pumpershow.com](http://www.pumpershow.com)

▶ Many of these seminars count toward continuing education credits. Check with your local representatives to see which seminars apply.

▶ FEBRUARY 24-27, 2010 • LOUISVILLE, KY



CELEBRATING **30** years 1981 - 2010



**OFFICIAL  
HOTEL OF  
THE 2010  
PUMPER &  
CLEANER  
EXPO!**



## HOTELS

Louisville has many great hotels to choose from. Some hotels are in walking distance to the Expo Hall and some are a quick 10 minute drive from downtown – the choice is yours!

**Call the Louisville Housing Bureau  
for help with your reservation.**

Monday - Friday 9:00 am to 5:00 pm EST

**1-800-743-3100** (toll free)

**1-502-561-3100** (international)

Or you can make reservations quickly online at  
**[www.pumpershow.com/pages/hotels\\_travel](http://www.pumpershow.com/pages/hotels_travel)**

▶ Call 1-866-933-2653 to register or to get detailed information about the 2010 Expo!



# Dewatering Made Simple

From coast to coast the most economical and simple way to dewater municipal sludge.

Do away with aging drying beds. Quit hauling water away for disposal just because 1-2% are solids. Don't even consider complicated, expensive and hard to maintain mechanical dewatering devices.



The Sludge Mate<sup>®</sup> together with the Poly-Mate<sup>®</sup> form a dynamic duo of dewatering. The Poly-Mate<sup>®</sup> conditions sludge through the addition of polymer and the Sludge Mate<sup>®</sup> dewateres the flocculated sludge.



Sludge Mates<sup>®</sup> are available in roll-off, trailer mounted, or permanently mounted tipping stands.



Tipping Stand



Roll-Off



Trailer Mounted

Flo Trend<sup>®</sup> Systems  
707 Lehman St.  
Houston, TX 77018

713-699-0152  
[www.flotrend.com](http://www.flotrend.com)  
[sales@flotrend.com](mailto:sales@flotrend.com)

## TREATMENT PLANT OPERATOR

# TPO<sup>TM</sup>

It's your magazine.  
Tell your story.

TPO welcomes news about your municipal wastewater operation for future articles:

**Hearts and Minds:** Your public education and community outreach efforts.

**PlantScapes:** Interesting features of your facility's grounds, signage or buildings.

**Greening the Plant:** Improvements at your facility that help the environment.

**How We Do It:** Interesting uses of equipment or technology.

**Send your ideas to [editor@tpomag.com](mailto:editor@tpomag.com) or call 877/953-3301**

# True Grit

AN INNOVATIVE TECHNOLOGY HELPS AN IOWA TREATMENT PLANT CORRECT A PROBLEM WITH ABRASIVE PARTICLES CAUSING EXCESS CENTRIFUGE WEAR

By Scottie Dayton

**G**rit in biosolids was destroying the dewatering centrifuge at the Council Bluffs (Iowa) Water Pollution Control Plant. Damage to the scroll bowl and other wear cost \$30,000 to \$40,000 per rebuild, sometimes done twice a year. Grit also accumulated in the anaerobic digesters, reduced their capacity, and was difficult and costly to remove.

When the plant began a preliminary treatment process upgrade, division superintendent Hank Pangelina worked with the consultant to find a grit removal solution to install using existing structures. The consultant liked vortex separators because of their long history. That equipment, however, relies on velocity to remove grit. Efficiency diminishes as flows return to normal after rainstorms. Pangelina wanted a system with the same peak-flow effectiveness that worked at average flows.

"I knew about the Eutek (Hydro International Wastewater) TeaCup headworks grit removal and washing system, and that led us to the newer HeadCell, SlurryCup, and Grit Snail system," says Pangelina. "The HeadCell units are built to trap specific-sized grit particles." Since Hydro International installed the system in 2004, the dewatering centrifuge is back on a standard maintenance schedule. The system is meeting everyone's expectations.

Two HeadCell units were retrofitted into the plant's old rectangular grit chambers.



## LOESS HILLS

The Water Pollution Control Plant serves 19,000 residential and 1,600 commercial, industrial, and institutional accounts. It operates a two-stage trickling filter system followed by integrated fixed-film activated sludge treatment. Effluent is discharged to the Missouri River.

Grit in the biosolids has been a problem since the plant opened in 1974. "We're a river town with a shallow water table, so the plant receives fine sands from the Missouri River," says Pangelina. "Our second source of grit is the Loess Hills, a rare geologic fea-



PHOTOS COURTESY OF HANK PANGELINA

Plant superintendent Hank Pangelina checks out two HeadCell units shortly after arrival at the Council Bluffs Water Pollution Control plant.

ture. Loess dirt is a light, gritty, porous material that erodes easily and winds up here."

The original plant had two coarse bar screens with 1-inch openings. They discharged to two aerated rectangular grit chambers with a chain and rake collection system. The settled grit was raked into a bucket elevator and deposited in a 20-cubic-yard roll-off container. During dry weather, waste haulers emptied the container twice a week.

Some grit still accumulated in the anaerobic digesters and caused wear on the centrifuge. "We did major repairs on the machine once a year, and that's abnormal," says Pangelina. When repairs were imminent, the staff pulled the biosolids inventory as low as possible to provide a four-week work window. Occasionally, repairs lasted five weeks. "Timing repairs with our dewatering needs was a constant challenge," says Pangelina.

## BUILT TO SIZE

Engineers from Hydro International worked with city consultants to design the system as part of a retrofit of the old plant's 15-foot-deep north and south aeration basins. The design called for 12-foot-diameter trays with seven per stack, two stacks per basin to achieve the required 75-micron removal. Building 12-footers was a first for the company.

The engineers wanted to do a particle-size analysis of the grit in the influent, but the heavy rain necessary to move the material through the system never arrived. "Grit particles coated with FOG, soap, and organics settle more slowly than equal-sized clean sand particles," says Pangelina. "Grit removal systems must be sized to capture those smaller particles. Without the analysis, we decided on 75-micron removal."

During installation, the plant headworks was bypassed for almost a year. The staff built screens to trap debris in the sewage before it damaged pumps and filled digesters, then cleaned them two or three times per shift. Handling the frozen material during winter made the work cold and miserable. "It was a challenge, and I give my guys a lot of credit," says Pangelina. "They worked hard to keep things moving."

## 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

"Installing other grit removal systems would have required building a pump station or upgrading our force main pump stations to operate at a higher head. Since we didn't have as much headloss across the HeadCell units, we avoided those expenses."

HANK PANGELINA

### SETTLING PARTICLES

After the retrofit, each aeration basin had two stacks of seven trays in a stainless steel frame. The trays, resembling plastic funnels, are stacked one inside the other with a small gap between them.

Wastewater flows through the bar screen set, down a stainless steel channel, and to a proprietary manifold that evenly distributes the flow to each HeadCell unit and its seven trays. Instead of falling 15 feet to the bottom of the old aerated grit tank, particles now settle 12 inches before hitting the bottom of the tray. Once captured, grit works its way down the center of the stack until it reaches a collector box in the bottom of the tank.



A conical base connects the grit collection box (stainless steel ring in center of cone) to the HeadCell stack. Settled grit is removed from the collection box via grit pumps on the back side of the basin wall.

A pump sends the grit in the collector box to the SlurryCup, which uses an open free vortex and boundary layer effect to capture, classify, and remove fine grit, sugar sand, snail shells, and high-density solids. It

separates organic content from the grit and returns it to the plant for treatment.

Grit and fine abrasives go to the Grit Snail dewatering device and settle onto an escalator belt of slow-moving stepped cleats. Dewatering begins as particles are gently lifted out of the unit's clarifier pool at 1 to 5 fpm. Grit-free water flows over a weir and out the clarifier. The belt carries dewatered abrasives to the top of the machine and discharges them into the dump container.

### NO PUMP STATION

"Installing other grit removal systems would have required building a pump station or upgrading our force main pump stations to operate at a higher head," says Pangelina. "Since we didn't have as much headloss across the HeadCell units, we avoided those expenses."

The HeadCell units require only quarterly maintenance. "We take one side down, dewater it, and clean it with a hose," says Pangelina. "We then do a quick inspection to make sure the fasteners are tight before putting it back online. They are trouble-free."

Pangelina received numerous phone inquiries about the system and some visitors. As a result, two other Iowa treatment plants are installing HeadCell units as part of upgrades. **tpo**

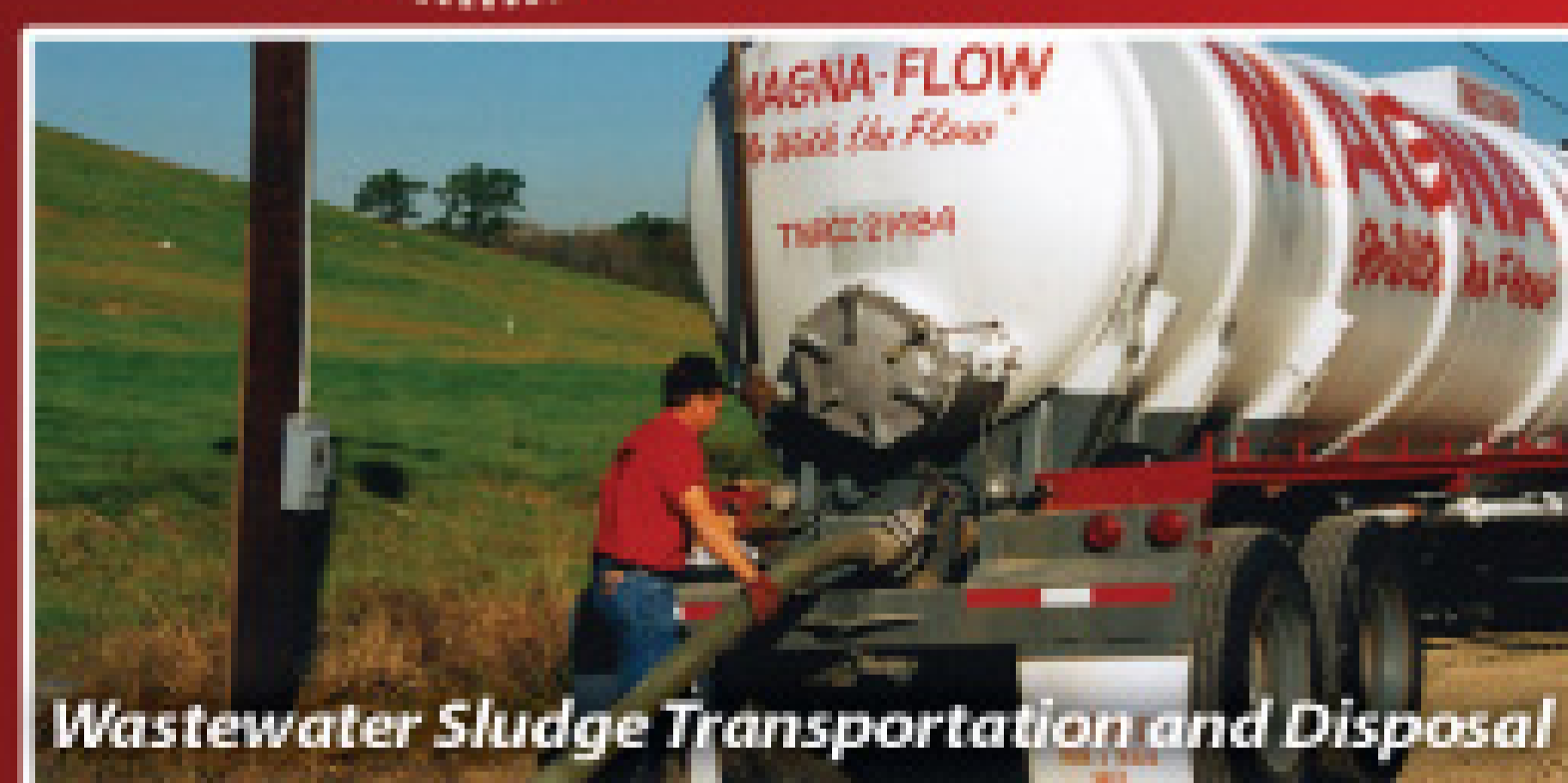
### more info:

**Hydro International Wastewater**  
503/615-8130  
[www.hydro-international.biz](http://www.hydro-international.biz)

**Magna Flow**  
Environmental

**We've Got You Covered!**

Wastewater Sludge  
Transportation  
and Disposal Services



Wastewater Sludge Transportation and Disposal



Air Mover "Vector" Services



Lagoon, Basin & Pond Cleaning



Mobile Dewatering



Belt Press Repair and Maintenance



Total Plant Cleanouts

*Go with the Flow!*  
**www.magna-flow.com**

**Magna Flow**  
Environmental

**Houston, Texas**  
Phone: (281) 448-8585  
Fax: (281) 397-7195  
**Info@magna-flow.com**

# Creating a *Resource*

THROUGH CHANGES IN EQUIPMENT, THE MOCCASIN BEND TREATMENT PLANT IN CHATTANOOGA, TENN., AVOIDED LANDFILLING OF VALUABLE BIOSOLIDS

By Diane Gow McDilda

The 140-mgd Moccasin Bend Wastewater Treatment Plant produces 30,000 dry tons of biosolids per year for land application as Class B material. (Photography by Dan Reynolds)



MOCCASIN BEND  
WASTEWATER  
TREATMENT PLANT

## BIOSOLIDS PRODUCED AT THE MOCCASIN BEND

Wastewater Treatment Plant weren't always considered a resource. Before improvements to the plant in 2005, all biosolids were shipped to the local landfill. Renovations moved the solids closer to a Class A product.

"I call it a Class A-minus/B-plus," says Jerry Stewart, director of the waste resources division of the plant, in Chattanooga, Tenn. "After the filter press is optimized, we won't necessarily go through EPA certification for Class A. If we do, we'll still handle it as a Class B."

Previously, the plant handled solids from two 65-foot-diameter anaerobic digesters using two 90-foot-diameter solids thickeners. The digested material was blended with waste-activated sludge, and the mixture was dewatered using plate-and-frame filter presses or centrifuges. The final product was then taken to a landfill owned by the Chattanooga Public Works, which also owns the treatment plant.

Changes in the treatment train now deliver a better product that is beneficially reused by land application to cropland on farms in Tennessee and Alabama. "The renovation will never pay for itself, but we no longer have to put the material in the landfill," says Stewart. "Ninety-eight tons is one year's space in the landfill and that's worth \$2.7 million."

### USING THE OLD

Renovations to the system made use of existing equipment to the extent possible. The two thickeners, installed as part of the original plant, were refurbished with new piping, and a protective coating was applied to the interior walls. The existing digesters were also refitted with new equipment that modified the digestion process.

"Infilco Degremont is the designer and provider of the entire set of equipment that makes up the thermophilic-mesophilic digestion process, called TPAD for temperature-phased anaerobic digestion," says Stewart.

"The process and its controls consist of Cleaver-Brooks boilers, a Cannon Mixer system (Infilco Degremont Inc.), fixed and floating digester covers, heat exchangers, Amot valves, and other components."

As part of the renovation, digester gas compressors and associated piping are now housed in a building on top of the digester building. This eliminated the need to meet explosion-proof electrical requirements during design and construction. Six digesters now operate as thermophilic (135 degrees F) or mesophilic (95 degrees F) digesters in two trains and destroy 50 to 70 percent of the volatile solids.

"Operators have their own language. They say they're either running pudding or running cake."

**JERRY STEWART**

"After spending five days in thermophilic digester number 1, the material is transferred into mesophilic digesters 3 and 5," says Stewart. "The material that spends five days in thermophilic digester number 2 is transferred into mesophilic digesters 4 and 6. After about 10 days in the mesophilic digesters, the material goes to the storage tank, where it is mixed with the thickened waste activated sludge and remaining primary sludge. Then it is sent to be dewatered by the centrifuges."

The storage tank holds 0.5 million gallons and was installed as part of the upgrade. From the storage tank, the mixture is pumped to one of the centrifuges.

"All material from the storage tank goes into any of the centrifuges," says Stewart. "The solids supervisor decides which ones are available for the day



**profile** 

**Moccasin Bend Wastewater Treatment Plant, Chattanooga, Tenn.**

<b>BUILT:</b>	1960; upgrades in 1972, 1983, 2002
<b>FLOWS:</b>	140-mgd design, 66-mgd average, 220-mgd peak
<b>TREATMENT LEVEL:</b>	Secondary
<b>TREATMENT PROCESS:</b>	Activated sludge
<b>RECEIVING WATER:</b>	Tennessee River
<b>BIOSOLIDS PROCESS:</b>	Anaerobic digestion, centrifuges
<b>BIOSOLIDS VOLUME:</b>	200 wet tons/day
<b>BIOSOLIDS USE:</b>	Land application of Class B cake (31 percent solids)
<b>WEB SITE:</b>	<a href="http://www.chattanooga.gov">www.chattanooga.gov</a>



Members of the Moccasin Bend team display a banner announcing the plant's Environmental Management System certification from the National Biosolids Partnership. From left, James Banks, chief plant operator; Joyce Snyder, administrative assistant 2; Joe Head, laboratory technician; Dian Benton, electrician 2; Brian Cate, electrician 2; Ginnifer Coffey, operator 2; Matt Schiesser, operator 3; Alice Cannella, plant superintendent; Brian Gilliam, operator 2; Eric Geissinger, chemist; Jeff Erlandson, chief electrical and instrumentation technician.



Plant superintendent Alice Cannella, PE.

### Moccasin Bend Wastewater Treatment Plant PERMIT REQUIREMENTS

PARAMETER	MONTHLY AVG.	WEEKLY AVG.
CBOD <sub>5</sub>	25 mg/l monthly avg.	35 mg/l weekly avg.
TSS	30 mg/l monthly avg.	40 mg/l weekly avg.
Ammonia as N	15 mg/l monthly avg.	20 mg/l weekly avg.

and how many are needed, based on the daily flow rates and volumes. We keep a sufficient number of centrifuges available, between maintenance requirements, to handle the necessary volume.”

Two high-G Flottweg centrifuges, each rated at 60 dry tons per day, deliver biosolids cake at about 23 percent solids. Dewatered biosolids from the high-G centrifuges are stabilized using limekiln dust, bringing the solids content up to 30 to 32 percent. The plant also uses two low-G Kruger centrifuges that produce 50 dry tons per day at 18 percent solids. When treated with limekiln dust, the solids content increases to 24 to 28 percent.

Operators are flexible and have their own way of expressing what equipment they're running. "Operators have their own language," says Stewart. "They say they're either running pudding or running cake."

### FARM AND ZOO

Ultimately, the plant produces more than 30,000 dry tons of biosolids a year. The material is spread over 4,000 acres in Tennessee and 2,800 acres in

Alabama. Private contractor Recyc LLC, of Boaz, Ala., handles hauling and land application.

After dewatering, the biosolids are stockpiled on site on a concrete pad storage area. Solids are normally stored one to two days, and older material is taken off site first. The trucks are weighed before loading and again before leaving. Front-end loaders move the solids to the trucks. Every truck is tarped and hosed down before making the drive to the farmland where the nutrients will support crops.

Accounting for the nitrogen, phosphorus, potassium, and ag lime, the plant staff estimated that in 2008, the nutrient value of the biosolids was \$3.7 million. The material is surface applied, not tilled in. "Farmers grow hay and pasture grass," Stewart says. "Once they cut the hay off, then they let the cows graze. We have some farmers that raise corn for silage."

The local community was skeptical about the safety of biosolids because they were transported not just off the treatment plant property, but out of the county, and even out of the state. To foster public confidence, the staff cordoned off a 15-acre plot on treatment plant property that is now farmed for hay and uses biosolids.



Operator Terry Davis with one of the plant's Flottweg high-G centrifuges.

## EVER THE INNOVATOR

Jerry Stewart brings a wealth of experience to his job as director of the Waste Resources Division of the Moccasin Bend treatment plant. His 38 years in the wastewater profession started with work as a consulting engineer, working on projects for the city. He credits the quality of work he does today to his longevity.

"You can't be a consummate engineer until you operate what you design," says Stewart. Years back, when offered a chance to move from consulting to working at the treatment plant, he had to clear it with someone else.

"I talked to my wife, and sometimes I think she regrets it," he says. "She thinks I'm married to the plant. It's been a great experience and a great career, as long as I can be innovative. When I can't work on ways to improve the facility, it's time for me to go."

Stewart leads a team that includes Joan Sloan, operator 3 (Grade 4 state license); Marty Knight, operator 3; Shannon White, operator 3; Danny Deal, operator (Grade 4); Frank Bales, operator 2 (Grade 2); Ginnifer Coffey, operator 2 (Grade 2); Terry Davis, operator 2; Valitus Edwards, operator 1; Brandon Collier, operator 1; Robert Williams, equipment operator; and Brian Lessman, plant operations supervisor for solids (Grade 4).



Jerry Stewart

"We have two cuttings a year and get about 5,200 bales," says Stewart. "It's used as part of public works construction projects, or we'll run it out to the landfill, and they'll use it for bank stabilization."

Another beneficiary of the crops grown on the treatment plant's property is the Chattanooga Zoo. After a fire in late 2006, Moccasin Bend offered the zoo hay, free of charge, to help feed the animals. The donations have continued, to the apparent pleasure of the camels who eat the biosolids-enriched hay.

## TOWARD CLASS A

Meanwhile, more improvements are in store for Moccasin Bend biosolids. Six J-Vap hot-water vacuum filter presses (Siemens) were installed as part of the upgrade and are being re-tested to make sure they meet performance requirements for dewatering and drying waste activated sludge.

"They are not yet in full-time use, but we expect them to be placed into full-time service soon," notes Stewart. "They will supplement production of biosolids that is now being fulfilled by the centrifuges. They will produce a Class A material that has been through a pasteurization process. That makes many more biosolids reuse options available to us."

"One 'aw shucks' wipes out 100 'atta-boys.'"

### JERRY STEWART

If that plays out successfully, another option for final disposition of the material will be to grind it and distribute it for use as a soil amendment. The city Parks and Recreation Department has expressed interest, as have municipal contractors. While Stewart appreciates the time needed to tweak the system, he admits, "I'm looking forward to getting through the performance tests."

He is also working with a polymer contractor who suggests different polymers to increase the solids content. But he has seen too often that success



Trucks owned by a private contractor haul biosolids at about 31 percent solids to farm fields. About 6,800 acres receive the material.

at one plant doesn't mean the same results at another. "We look at everybody's polymers and have seen plants that use rotary drum mixers and run sludge with polymers," he says. "But what works in Chattanooga may not work in Knoxville or Atlanta."

The plant renovation also included a heat recovery and transfer system. Two boilers (8.3 MMBtu each) run on digester gas, or natural gas if needed, to heat the biosolids to temperatures adequate to destroy pathogens. Six solid-to-water heat exchangers capture heat entrapped in the solids going to the mesophilic digesters and use it to pre-heat solids entering the thermophilic digesters.

## EXPERTISE AND ENTHUSIASM

It's the drive to innovate that keeps Stewart looking to the future of biosolids. After seeing an announcement in the Mississippi State Alumnus magazine, he contacted his alma mater asking to be involved in a study the university was conducting on creating biofuel from biosolids. The same drive leads him to keep up with an anti-biosolids blogger, just to know what's being said.

Stewart understands the opposition to land applying biosolids, and that's why he and his team work to exceed, not just meet, regulatory requirements. When it comes to negative press coverage, Stewart believes it's sometimes warranted. "Either they're not applying it right, or they're applying more than they're supposed to or where they shouldn't be applying it," he says.

As part of its desire to bring integrity to the Moccasin Bend biosolids program, the plant joined the National Biosolids Partnership (NBP) in August 2005 and began work on an Environmental Management System. In February 2009, the plant became the 23rd agency in the U.S. and the first in Tennessee to receive NBP certification. To celebrate, representatives from NBP, the Water Environment Federation, and National Association of Clean Water Agencies were invited to the plant. An enthusiastic group hoisted a flag in honor of the event.

But Stewart understands that a good reputation is only as good as the next act and he intends to continue running a tight ship. "One 'aw shucks' wipes out 100 'atta-boys,'" he says. With a chuckle, he admits he doesn't always use the word "shucks." **tpo**



Terry Davis at the centrifuge/polymer control panel.

## more info:

**Amot**  
281/940-1800  
[www.amot.com](http://www.amot.com)

**Cleaver-Brooks**  
414/359-0600  
[www.cleaver-brooks.com](http://www.cleaver-brooks.com)

**Flottweg**  
859/448-2300  
[www.flottweg.com](http://www.flottweg.com)

**I Kruger Inc.**  
919/677-8310  
[www.krugerusa.com](http://www.krugerusa.com)

**Infilco Degremont Inc.**  
804/756-7600  
[www.degremont-technologies.com](http://www.degremont-technologies.com)

**Siemens**  
800/525-0658  
[www.siemens.com](http://www.siemens.com)

## industry news

### Pure Technologies Acquires Jason Consultants

Pure Technologies Ltd. has purchased the operating subsidiaries of Jason Consultants Group Ltd., specializing in underground infrastructure engineering and technology, including inspection, assessment and rehabilitation of water and wastewater pipelines, trenchless technology and related fields.

### Hobas Celebrates 25 Years of Growth

Hobas Pipe USA marks 25 years of serving the U.S. market. With 44,000 miles of pipe in service globally, Hobas has supplied 5.3 million feet of 18- to 110-inch pressure and non-pressure pipe to the U.S.

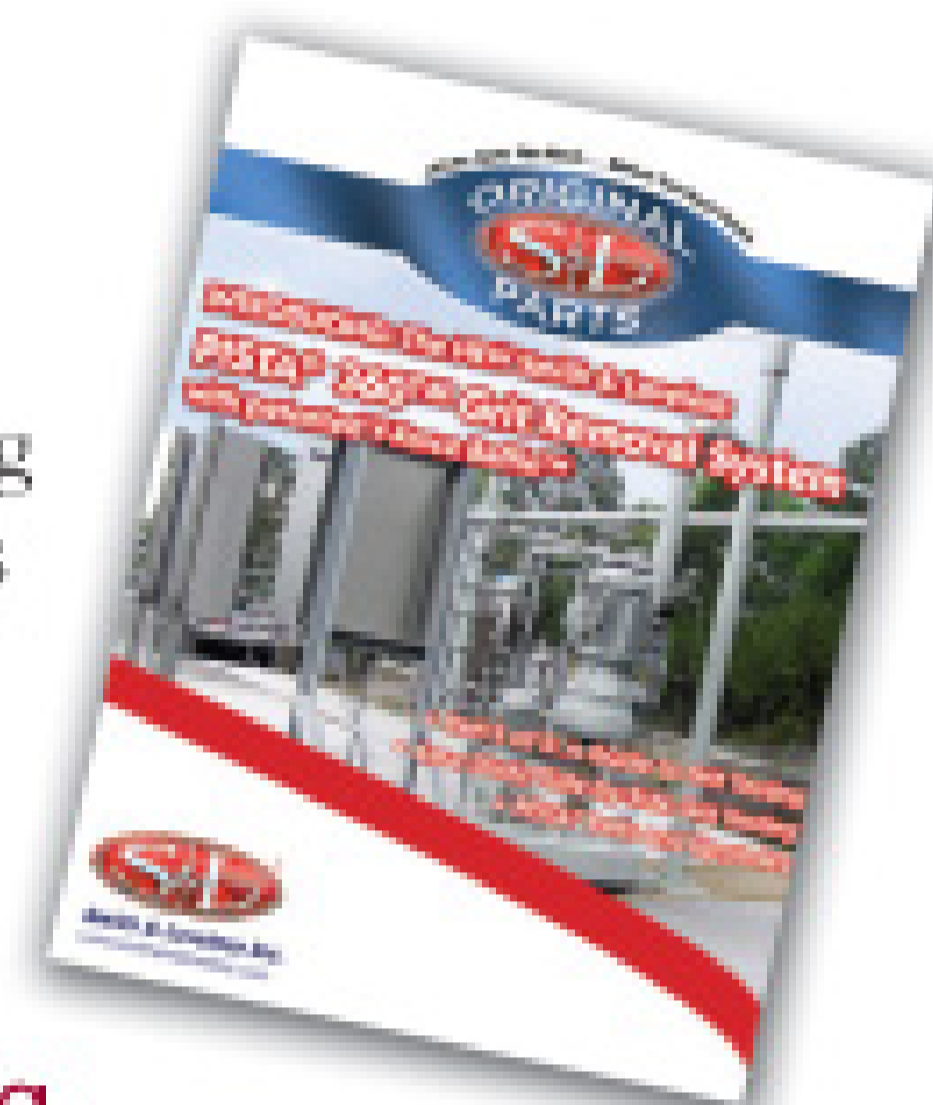
### Geospatial Retains Financial Advisor; CEO Speaks at Forum

Geospatial Holdings Inc. has retained Convertible Capital, New York City, as its financial advisor. The companies are initiating a multi-stage capital raising effort designed to take advantage of Geospatial's near- and longer-term commercial opportunities.

Geospatial's CEO, Mark A. Smith, was a panelist at the Cleantech Forum XXIII in Boston.

### Smith & Loveless Release Quarterly Parts Catalog

The Fall 2009 Treatment Quarterly Parts Catalog from Smith & Loveless Inc. features the company's latest wastewater treatment products. Copies can be downloaded from the company's Web site, [www.smithandloveless.com](http://www.smithandloveless.com).



### Fabiyl Joins Environmental Operating Solutions as CTO

Malcolm Fabiyl, Ph.D., joined Environmental Operating Solutions Inc. as chief technology officer. He has been instrumental in developing and commercializing technologies related to the optimization of aeration and mixing systems, nutrient removal processes, sludge minimization and digester performance at municipal and industrial wastewater treatment facilities. Fabiyl has a chemical engineering degree from the University of Lagos, an MBA from the University of Chicago Booth School of Business and a doctorate in chemical engineering from the University of Cambridge.

### SPiR STAR Distributor for SAMI High Pressure Valves

SPiR STAR was selected as the exclusive distributor for SAMI Instruments high-pressure valves. The product line consists of NPT, medium- and high-pressure needle valves, ball valves and check valves with working pressures up to 60,000 psi.

### SEL Products Available in B&B Electronics Catalogs

Communications products from Schweitzer Engineering Laboratories Inc. are available in B&B Electronics Manufacturing Co. catalogs and Web sites. SEL designs, manufactures, supplies and supports products and services for power system protection, monitoring, control, automation and metering. **tpo**



**WHAT'S INSIDE?**  
Vital information on caring for vital infrastructure.

35,000 municipal and utility maintenance professionals rely on *Municipal Sewer & Water* every month.

**A subscription is FREE.**  
[www.mswmag.com](http://www.mswmag.com) or 800-257-7222



# Energy Management

By Benjamin Wideman

## RECYCLING SYSTEM

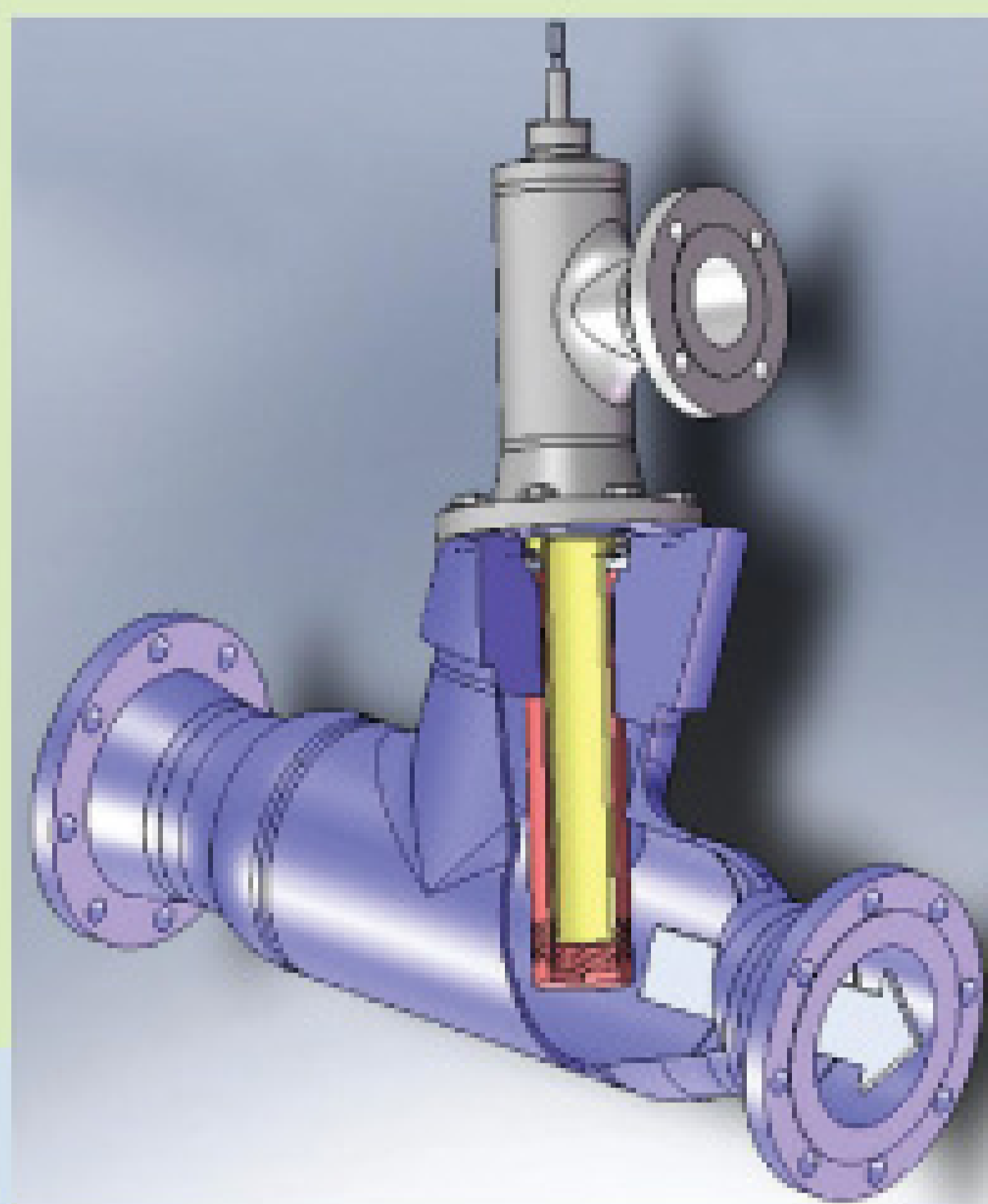
Anue Environmental Inc. offers the **EP-1320 System**, which recycles a small fraction of discharged wastewater back into the pump station, resulting in surface agitation for breakup of FOG and biofilm buildup. The unit also increases dissolved oxygen levels up to 800 percent while solids are homogenized. These actions optimize in-well conditions, promoting pretreatment solids breakdown. The system recycles wastewater and requires no external power or water source to enable operation. **800/559-7159; www.anueenv.com.**



EP-1320 System from Anue Environmental Inc.



AquaPASS Phased Activated Sludge System from Aqua-Aerobic Systems Inc.



PSX Sludge Heater from ProSonix

## EFFICIENT SLUDGE HEATING

ProSonix offers the **PSX Sludge Heater** for biogas production in anaerobic digesters. With no hot surfaces on the sludge heater, the system eliminates plugging and fouling from burn and scorch buildup. The inline sludge and slurry flow is designed for high solids and large particulates. The angled steam diffuser, with single-point entry into the heater, allows for clearance and has no hang-up points for fibrous materials. A low-liquid pressure drop across the heater, typically 1 to 2 psig, reduces energy demand. The steam injector's diffuser design produces 360-degree delivery of steam into the sludge for more uniform heating. **800/849-1130; www.pro-sonix.com.**

## OUT WITH WASTE HEAT

**Compact Cabinet Coolers from Noren Products Inc.** remove waste heat from sealed electrical panels and enclosures using Noren heat pipe technology. The design dissipates heat from sensitive electronic components without exposing them to the harsh, dirty environment outside the cabinet.

With all the models, there is no exchange of air from inside to outside, thus keeping contaminants out and keeping the inside cool, dry and clean. Among the versions are drop in air-to-air, flush mount, air-to-water, and internal flush mount. **866/936-6736; www.norenproducts.com.**

## NUTRIENT REMOVAL

The **AquaPASS Phased Activated Sludge System from Aqua-Aerobic Systems Inc.** uses time-based process management in a continuous-flow regime. The system provides aggressive reduction of nitrogen and phosphorus in a compact solution with minimal operation and maintenance costs.

The flexible tank design and equipment options support a wide range of tank



Compact Cabinet Coolers from Noren Products Inc.



SAF Series Fixture from AZZ/Rig-A-Lite

geometries, depths and footprint limitations. This allows easy retrofitting of oxidation ditches or other activated sludge processes. A flexible nitrogen control system reduces sludge recycling pump requirements. Phase Separator technology optimizes anaerobic treatment for advanced phosphorus removal and reduces waste activated sludge (WAS) volume by 20 to 50 percent. **815/654-2501; www.aqua-aerobic.com.**

## ENERGY-SAVING FIXTURES

The **SAF Series Fixture from AZZ/Rig-A-Lite** is available with ceiling, pendant, wall, stanchion and cone-top mounting. There are also various combinations of globes, guards, refractors, reflectors and other options. The fixtures are used in wastewater treatment plants and other areas where hazardous location, heavy hose-down or wet or damp location require corrosion resistant or restricted-breathing fixtures.

The product is available with metal halide, high-pressure sodium and compact fluorescent lamping options, various photometric options and a range of wattage and voltage options. Emergency battery backup is available. **713/943-0340; www.rigalite.com. tpo**

# Finding a Calling

RUSSELL IRWIN FOUND REWARDS IN TRAINING TREATMENT OPERATORS ACROSS NEBRASKA AND SEEING THE RESULTS IN THE FORM OF “SPARKLING CLEAN” EFFLUENT

By Ted J. Rulseh

**T**he wastewater treatment operator certification roles in Nebraska list some 900 people. Many, if not most, of them have been trained by Russell Irwin, a program specialist with the state Department of Environmental Quality’s training, certification and technical assistance section.

During 36 years with the department, Irwin traveled the state giving training classes for operators seeking Class 1 and Class 2 certification. He also handled administrative functions related to certification and provided on-site troubleshooting support to operators. He retired August 26 at age 71.

Irwin estimates he trained as many as 1,000 operators in the past 10 years, and he has known the satisfaction of watching them progress in their careers and achieve high performance in treatment plants around the state, and elsewhere. He talked about his experiences as a trainer in an interview with *Treatment Plant Operator*.

**tpo:** How did you get involved in wastewater treatment?

**Irwin:** I graduated from Sterling College in Sterling, Kan., in 1963 with a B.A. degree in social science and an emphasis in education. I taught junior high school science seven years in three different places.

I later went to the wastewater technical school in Neosho, Mo., and studied to be a wastewater operator. When I graduated from that nine-month program, it just happened to be the time when the EPA had money to fund an operator trainer in every state, plus a secretary, for one year. I wrote letters to the states of Nebraska and Kansas, and

Russell Irwin trained numerous wastewater operators during 36 years with the Nebraska Department of Environmental Quality. He wears a prosthesis because he lost an arm in a construction site accident while in his early 20s, before he became involved in the treatment profession.



Russell Irwin

**tpo:** What would you say is the biggest challenge you have faced in your years as a trainer?

**Irwin:** In 1987, the state legislature passed mandatory certification for wastewater treatment operators. I was involved at that time in the voluntary certification program run by the Nebraska Water Environment Association.

When certification became mandatory, that started a pretty serious amount of classroom training. Operators had a deadline to get certified by August 1989. So 1988 and 1989 were very busy years.

Also at that time, the people who had voluntary certification before the August 1989 deadline were grandfathered into the program. So for our very last voluntary certification test, we had quite a roomful of people. They wanted to take the voluntary certification test, which was open book, rather than the mandatory test.

Ever since that time, our certification law has required us to do training somewhere in the state at least once a quarter. I did that

“It seems a lot of us get into wastewater treatment somewhat accidentally. It’s not a job that many people set out to do on purpose — circumstances just seem to lead people to this field.”

## RUSSELL IRWIN

I got the job in Nebraska. That was in 1973. The job involved classroom training as well as on-site assistance and troubleshooting for operators at their own treatment plants.

**tpo:** So that’s what you’ve been doing ever since?

**Irwin:** Not quite. The national training center was shut down in 1980, so there was a gap during which my agency assigned me to do treatment plant inspections rather than training. I did inspections until 1984. Then the feds revived the funding for treatment plant assistance, and I switched sections within the department and got into training again. Since then, the people in charge have changed three or four times, but my position hasn’t changed much. It’s been a good life.

pretty much myself. I typically gave four or five training programs per year. My last class was August 4 in North Platte.

**tpo:** What levels of certification are offered in Nebraska?

**Irwin:** There are five levels: Wastewater Operator Class 1, 2, 3 and 4, plus a level for lagoon treatment systems only. I was involved with training for Class 1 and 2. I’ve been involved with a lot of people, helping them get started in the field.

**tpo:** What did you find the most rewarding about your career?

**Irwin:** There just seem to be a lot of good people in the wastewater business. They really want to learn and do a good job. It’s sat-

isfying to see people making progress in their careers. Some of my students have gone on to other places, to higher levels of certification, and to higher-level positions.

People in wastewater seem to come with pretty good work ethics. They're fairly versatile as a group. In a small town, the water and wastewater guy may also be the dogcatcher, mow the parks, plow the snow. They seem to be able to balance all those things and get most of it done.

I had experiences recently with a couple of people from farming backgrounds getting into wastewater treatment. Those guys, when something needs fixing, they'll whip out the pliers or whatever is needed and fix it, whereas some other folks might just go to a catalog and order a new one. It's interesting to see people who are willing to solve problems with a bit of work.

**tpo:** What kinds of backgrounds did you see new operators coming from?

**Irwin:** It seems a lot of us get into wastewater treatment somewhat accidentally. It's not a job that many people set out to do on purpose — circumstances just seem to lead people to this field.

I recently talked to one of my former students, probably from the mid-1980s. He had been in construction, and in fact he helped build a treatment plant in Ogallala, Neb. He decided he didn't want to travel around with a construction crew anymore, so he settled down and worked at the treatment plant in Ogallala for a while.

Then he went to Kennebunk, Maine. In the meantime he had married a Nebraska girl. They got homesick and came back, and he got a job in Sterling, Colo., not very far from Ogallala. He has progressed up the ladder and is now in charge of water and wastewater in Sterling. He was recently appointed to the certification board in Colorado.

It's rewarding to know I helped inspire him to get up and do those kinds of things. He told me he appreciated the class work, and he said he wished he had gotten into wastewater treatment earlier in the game.

**tpo:** When acting as a troubleshooter for plant operators, what were some of the more common problems you had to solve?

**Irwin:** We have a large number of activated sludge plants in this state, and I had to help people learn that wasting sludge was not a bad thing to do. When I started out, the word "wasting" had a very bad connotation. These people's parents had been through the depression, and they had been taught not to waste anything. Well, you have to waste your sludge. When they figured that out, it made things work better.

A lot of people needed a little help with their arithmetic. Another process-related issue was controlling the return activated sludge. A lot of plants had airlift pumps for that purpose, and they were a little tricky to adjust.

**tpo:** Do you have any memorable moments as a troubleshooter?

**Irwin:** My colleagues sometimes joke about the fact that I once fell into a final clarifier. I couldn't swim, so it was a good thing one of our engineers, Curt Christiansen, was with me that day. He pulled me out. We had done some on-site work at the plant in Avoca. The operator wasn't around because he had a full-time job somewhere else. We were in there looking around, and I leaned over the guardrail a little bit too far, and the next thing I knew I was in there.

**tpo:** Looking ahead, what do you see coming down the road for the profession?

**Irwin:** The regulations are probably going to get tighter. People here are still working on meeting the ammonia standards, and if the state gets to regulating total nitrogen, that will require some adjustment. There is some talk about adding phosphorus limits. Phosphorus removal seems like it might be a little tricky to accomplish.

**tpo:** Many areas of the country see a coming shortage of treatment operators. Do you see that in your part of the world?

**Irwin:** Things don't seem to be heading that way. A lot of Nebraska people like to stay put. They may go around the world a little bit, but then they come back here, and they stay. In the small towns, they have pretty good luck in finding someone who likes the

"When I started out, the word 'wasting' had a very bad connotation. These people's parents had been through the depression, and they had been taught not to waste anything. Well, you have to waste your sludge. When they figured that out, it made things work better."

**RUSSELL IRWIN**

variety that the jobs give, and like living where they grew up. You can find people when you need them.

People are getting into the business at a mixture of ages. Some have decided they don't want the pressure of whatever they've been doing. They want something a little more relaxed, and they may get that in municipal work. We also have young folks coming in.

**tpo:** What comes next for you, now that you're retired?

**Irwin:** I might do a little woodworking. There are some places I haven't been to before, like the Grand Canyon and Niagara Falls. And I want to see if I can find some way to stay involved in the business a little bit — answering questions for people, maybe doing a little consulting.

**tpo:** What will you remember most about your career?

**Irwin:** When I would go to a treatment plant and find their effluent sparkling clean — that was always really nice to see. It hasn't always been that way. **tpo**

**TREATMENT PLANT OPERATOR**

**tpo**

It's your magazine.  
Tell your story.

TPO welcomes news about your municipal wastewater operation for future articles:

<b>Hearts and Minds:</b> Your public education and community outreach efforts.	<b>Greening the Plant:</b> Improvements at your facility that help the environment.
<b>PlantScapes:</b> Interesting features of your facility's grounds, signage or buildings.	<b>How We Do It:</b> Interesting uses of equipment or technology.

Send your ideas to [editor@tpomag.com](mailto:editor@tpomag.com) or call 877/953-3301

# Green Pumping

MANUFACTURERS OFFER HIGH-EFFICIENCY PUMPS FOR MOVING WASTEWATER, SLUDGE, AND CHEMICALS WITH LOWER DEMAND FOR ELECTRICITY

By Benjamin Wideman

**M**oving fluids and solids streams takes energy. High-efficiency pumping systems can help wastewater treatment plants reduce their energy bills and shrink their carbon footprint. Here are just a few of the high-efficiency pumps available from manufacturers for a wide range of pumping applications.

## CHEMICAL TRANSFER

**ProVane Motor Speed Vane pumps** from **Blackmer** are geared to chemical transfer applications for wastewater treatment. Available in ductile iron or stainless steel models, the pumps are designed for continuous duty in low- and medium-viscosity process applications. They are also capable of low-flow, high-head applications on low-viscosity fluids where centrifugal pumps cannot effectively operate. The pumps deliver operating speeds up to 3,600 rpm and capacities from 6 to 100 gpm. **616/241-1611; www.blackmer.com.**



## EASY TO SERVICE

**Eclipse pumps** from **Pulsafeeder Inc.** have only 16 parts that are self-aligning and allow for easy maintenance. The pump can be entirely serviced from the front with minimal tools. It is magnetically driven and has zero leakage with no seal flush system. Universal motor adaptors mate up to multiple NEMA and IEC motors, and universal flanges mate to both ANSI and DIN flange connectors. The Eclipse 125 features a wider drive gear, idler gear and liner and is crafted with engineered fluoropolymer, carbon graphite and graphite-impregnated silicon carbide bearings. **585/292-8000; www.pulsafeeder.com.**



## WIDE RANGE OF CHOICES

**Advanced Series pumps** by **Wilden Pump & Engineering Co.** are available in diecast aluminum, stainless steel and alloy C, in sizes from one to three inches, and in flow rates 56 to 270 gpm and maximum pressures to 125 psi. The pumps are available with elastomer options that include Buna-N, Neoprene, EPDM, Polyurethane, Saniflex, Quadra-flex, PTFE, Viton and Wilflex with temperature limits -60 to 350 degrees F. **909/422-1730; www.wildenpump.com.**

## CONTROL OPTIONS

**Series 500 hydraulic metering pumps** from **Neptune Chemical Pump Co.** are available with four automatic control options. Electric stroke control allows control automatically by a process instrument or manually from a remote location. Pneumatic stroke control can be controlled by an instrument air signal to change stroke length. Variable speed control is controlled automatically by a process instrument using a variable-speed drive to change pump-stroke speed. Sodium hypochlorite gas bleed is a special head designed with an automatic air release valve to vent gas accumulation from chemicals that offgas. **888/363-7886; www.neptune1.com.**



## MULTIPLE SIZES

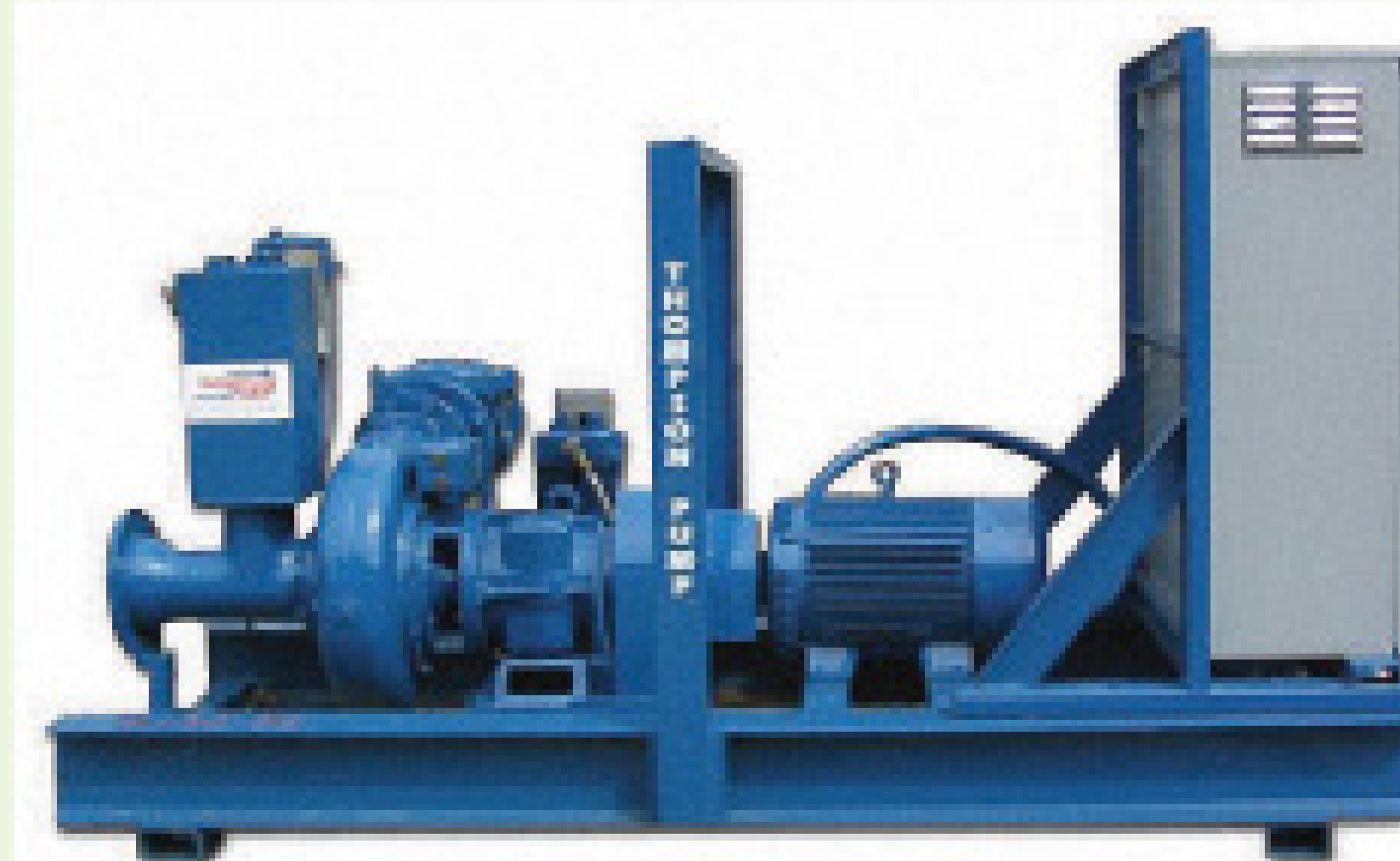
**811 Series ANSI pumps** from **Griswold Pump Co.** have large sight glasses and magnetic drain plugs. A fusion-bonded epoxy coating on the interior surface of the power frame provides a barrier between the iron frame and oil. The pumps offer a full range of pump sizes for flow rates up to 4,000 gpm. Standard and low-flow models are available. Features include heavy-duty power frames, fully open impellers with rear adjustment capability, and a variety of mechanical seal options. The pumps are available with ductile iron, 316 stainless steel, CD4MCu and Alloy 20 liquid paths. **800/843-9222; www.griswoldpump.com.**



The pumps are available with ductile iron, 316 stainless steel, CD4MCu and Alloy 20 liquid paths. **800/843-9222; www.griswoldpump.com.**

## ELECTRIC OR DIESEL

**JSC Series Solids Handling Enviroprime portable pumps** by **Thompson Pump & Manufacturing Co. Inc.** range in size from 3 to 18 inches. They are



designed for high flows to 11,000 gpm and heads to 330 feet and are available as diesel or electric-driven. These end-suction centrifugal pumps can handle solids up to 4 inches. The compressor-assisted dry priming system prevents blow-by from discharging onto the ground. **800/767-7310; www.thompsonpump.com.**



### HIGH FLOW, MODERATE PRESSURE

The **STV pump** from **Ruhrpumpen Inc.** can operate at very high flow with moderate discharge pressures up to 65 psi. A contoured shaft nut matches the shroud line so that stringy materials will not catch. The pump is contoured to match internal waterways so that flow is unimpaired. For maximum efficiency, the adjustable rotor position provides for controlled impeller-casing clearance. **800/334-2553; www.ruhrpumpen.com.**

### HIGH HEAD ABILITY

**Pumps 2000 America AODD** by **Megator Corp.** include 1-, 1.5- and 2-inch designs capable of passing up to 1.5-inch solids. A fire retardant anti-static (FRAS) conductive plastic carrying an Atex M1 rating is included. Supersuction ability (27 feet, wet or dry) is due to the unit's double-hinged diaphragms, long stroke, and self-cleaning slurry and ball valves. **800/245-6211; www.megator.com.**



### WIDE RANGE OF LIQUIDS

**Trash Auto Prime Pumps** from **Global Pump Co.** handle a wide range of liquids, including water, sewage and sludge that can contain solids and other material. They are completely automatic and self-priming

pumps. The vortex impeller minimizes drag for improved fuel efficiency and extended run time.

The model 6GSTAP has maximum flows of 2,000 gpm and maximum total head of 165 feet while handling solids up to three inches in diameter. It is powered by a water-cooled, 4-cylinder diesel engine. Alternative drives are

available, including electric motors. The complete line of pumps includes sizes from four inches to 18 inches with maximum flows from 1,250 to 12,000 gpm and solids handling capability up to 4 inches. **866/360-7867; www.globalpump.com.**



### MOVING SLUDGE AND SEWAGE

The **Patterson Pump Co.** H2O Works municipal line of wastewater pumps includes the **Forceline NCS** Series pump, designed for efficient pumping of sludge and raw unscreened sewage. Its self-cleaning ring prevents clogging. This field-tuned, dry-pit service pump comes in capacities from 150 gpm to 12,000 gpm, with heads in excess of 250 feet. It is available in three basic configurations, from 3-inch to 12-inch discharge. **706/886-2101; www.pattersonpumps.com.**

### SPACE-SAVER

The **Qube Blower Package** from **Tuthill Corp.** includes the Qx blower, a quiet, quick-delivery solution for wastewater aeration. The unit has a compact footprint to reduce space requirements and is in a powder-coated steel enclosure to reduce noise (24 dBA attenuation). Additional features include integral check valve, discharge from back, and discharge flexible connector. **800/825-6937; www.tuthill.com. tpo**



**TPO online magazine is just one click away.**



**tpomag.com**

## people/awards

**Jen Thoreson** received the Laboratory Operator Award from the Minnesota Wastewater Operators Association.

Iowa Water Pollution Control Association award recipients include:

- **Mark McGuire**, Arthur Sidney Bedell Award
- **Tim Snyder**, William D. Hatfield Award

Central States Water Environment Association award recipients include:

- **Dan Busch**, Green Bay Metropolitan Sewerage District, William D. Hatfield Award
- **Western Lake Superior Sanitary District**, George W. Burke Jr. Facility Safety Award
- **Jim Roth**, Arthur Sidney Bedell Award
- **Darsey Thoen** (Moorhead, Minn.), **Paul Christensen** (Fort Atkinson, Wis.) and **Ralph Pfister** (Yorkville-Bristol Sanitary District), Operations Award
- **SunOpta Ingredients Inc.**, Industrial Environmental Achievement Award
- **Rachel M. Lee**, Young Professional of the Year

- **Mark Zimmerman**, City of Janesville, Laboratory Analyst Excellence Award
- **Rick D. Pace**, City of Racine, Quarter Century Operators Club
- **Max Anderson**, University of Wisconsin-Platteville, Bill Boyle Educator of the Year Award
- **Petia Tontcheva** (University of Illinois) and **Kathryn Weissman** (Illinois Institute of Technology), Academic Excellence Award
- **Joshua Gable**, **Nick Bartolerio**, **Daniel Bauknetch**, **Michael Sargent**, **Kevin Ziolo** and **Hiroko Yoshida** (University of Wisconsin) and **Adam Both**, **Eric Hettler**, **Steve Hankey** and **Grete Schmale** (University of Minnesota), Student Design Competition

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

## education

### Kansas Water Environment Association

The KWEA has these seminars:

- Dec. 2 – Safety, Dodge City
  - Dec. 2 – Advanced Wastewater, Humboldt
  - Dec. 2 – Small Systems Wastewater Operations, Hays
  - Dec. 3-4 – Programmable Logic Controllers, Manhattan
  - Dec. 4-5 – Ethics, Medicine Lodge
  - Dec. 9 – Applied Math for Wastewater Operators, Liberal
  - Dec. 11-12 – Natural Systems for Wastewater Treatment, Goodland
  - Dec. 16 – Ethics, Liberal
  - Dec. 17-18 – Wastewater District School, Emporia
  - Dec. 17-18 – Motors and Drives, Olathe
  - Dec. 18-19 – Wastewater Reclamation and Reuse, Dodge City
  - Dec. 30 – Small Systems Wastewater, Dodge City
  - Jan. 7 – Small Systems Wastewater, Garden City
  - Jan. 13 – Waste Stabilization Ponds, Dodge City
  - Jan. 14 – Small Wastewater Systems, Clearwater
  - Jan. 16 – Small Systems Wastewater Operations, Goodland
  - Jan. 22-23 – Stormwater Management, Hays
  - Jan. 27 – Membranes for Wastewater Treatment, Garden City
  - Jan. 28-29 – Activated Sludge, Pittsburg
  - Jan. 29-30 – Wastewater Reclamation and Reuse, Medicine Lodge
- Visit [www.kwea.net](http://www.kwea.net).

### Missouri Water Environment Association

The MWEA has these workshops:

- Dec. 9 – Operations and Maintenance Workshop, Moberly
  - Dec. 10 – Operations and Maintenance Workshop, Farmington
- Visit [www.mwea.org](http://www.mwea.org).

### New England Interstate Water Pollution Control Commission

The NEIWPCC has these seminars in Maine:

- Dec. 9 – Basic Electricity, Yarmouth
  - Dec. 15 – Bearing Maintenance and Installation, Boothbay
- Visit [www.jetcc.org](http://www.jetcc.org).

### North Carolina American Water Works Association

The NCAWWA has a seminar on Effective Management for Efficient Operation in the Water and Wastewater Industry Today in Browns Summit on Dec. 10. Visit [www.ncsafewater.org](http://www.ncsafewater.org).

### Ohio Water Environment Association

The OWEA has a Biosolids Specialty Workshop in Columbus on Dec. 10. Visit [www.ohiowea.org](http://www.ohiowea.org).

### Texas Water Utilities Association

The TWUA has a safety seminar in Waco Dec. 1-3. Visit [www.twua.org](http://www.twua.org). **tpo**

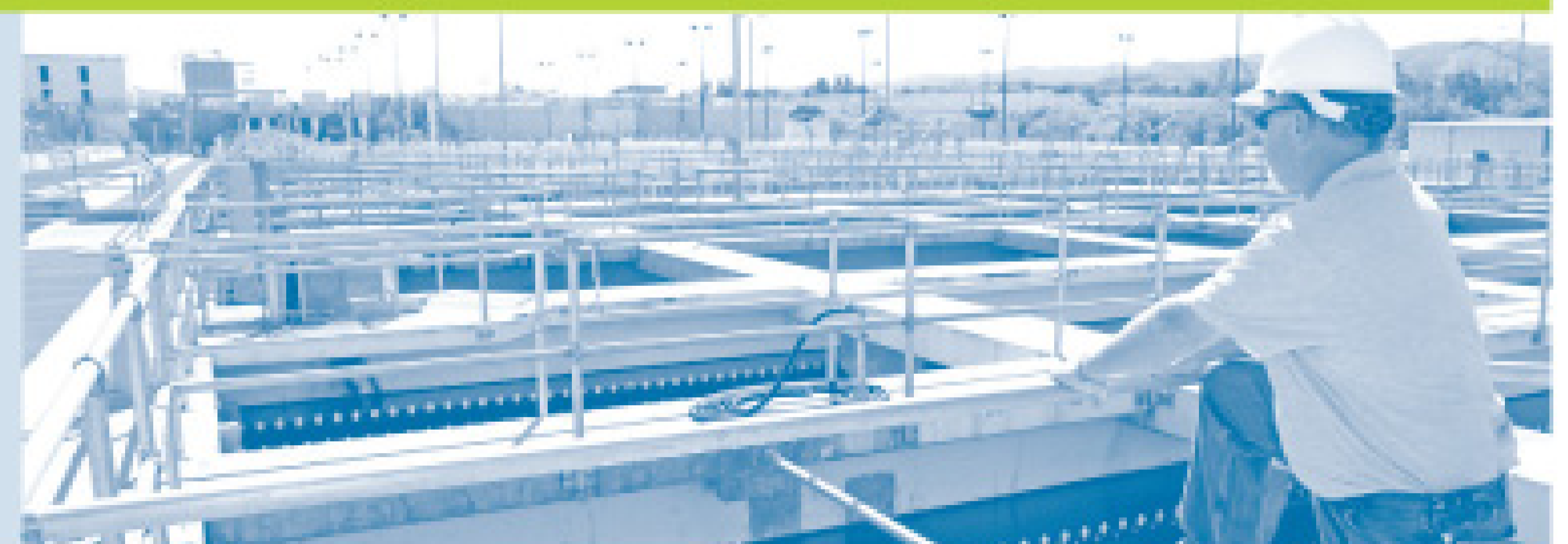
## CALENDAR OF EVENTS

### Jan. 31-Feb. 3


New York Water Environment Association Annual Meeting, Marriott Marquis, New York. Visit [www.nywea.org](http://www.nywea.org).

### Feb. 24-27

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




**Foam, Foam go away...**



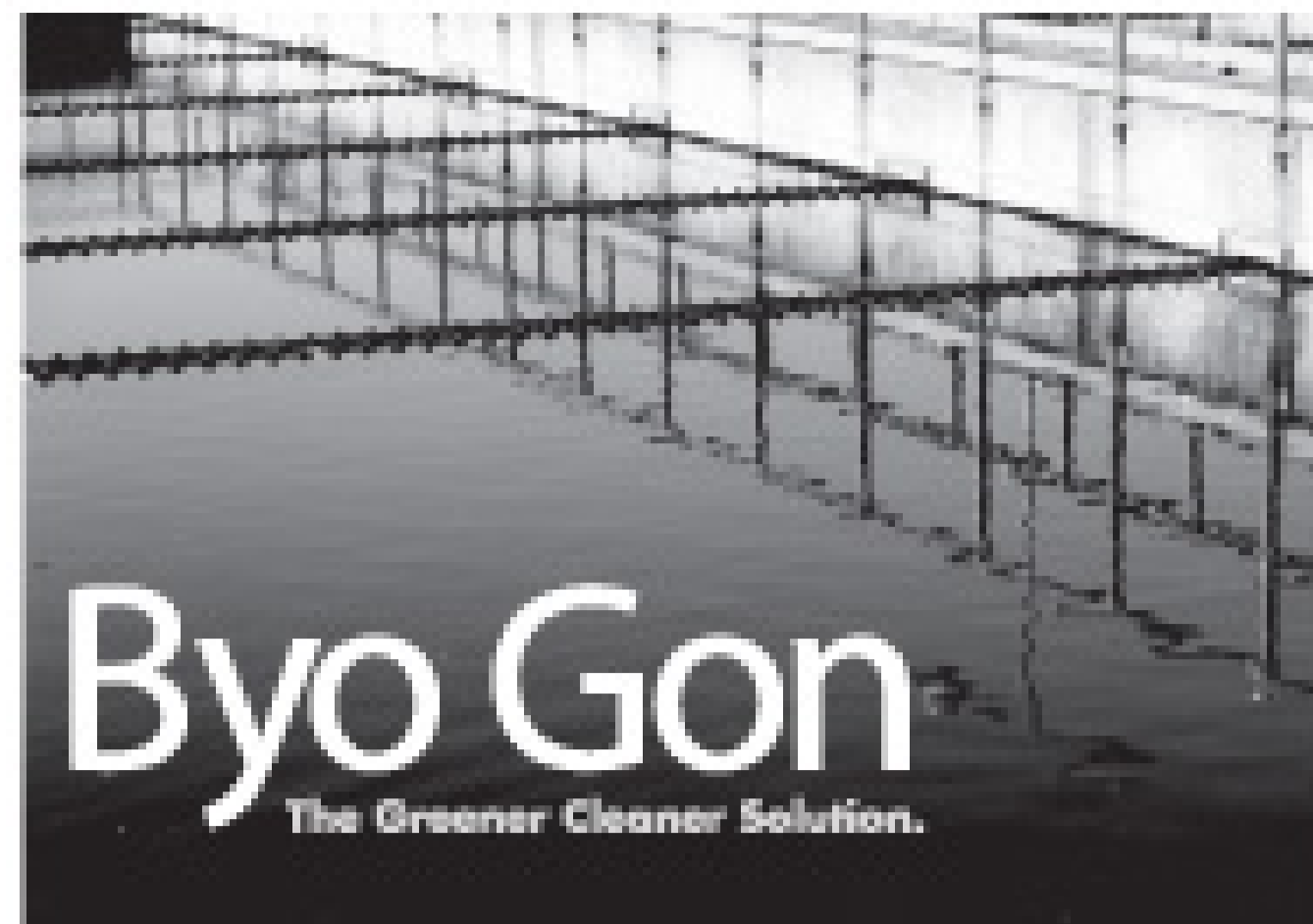
**Foam in your basins?**

We can help you understand this bull so you can grab it by the horns!



**AQUAFIX**  
*Innovations in wastewater treatment.*

1.888.757.9577  
[www.teamaquafix.com](http://www.teamaquafix.com)  
*Reps Welcome!*




**Byo Gon**  
*The Greener Cleaner Solution.*

The All Natural Solution For Waste Water Treatment

**Distributor Inquiries Welcome**

Byo-Gon is a 100% all natural bio-stimulant that is extremely effective both in collection systems and wastewater plants in eliminating odors, managing grease, reducing wasted solids, and removing sludge buildup in ponds and lagoons. BYO-GON also greatly enhances BOD and TSS removal and improves anaerobic digester operation.

Visit our web site at [www.byogon.com](http://www.byogon.com) to learn more about The Greener Cleaner Solution.



[www.byogon.com](http://www.byogon.com) • 888-BYOGON-1  
 518.796.2772

Simple Solutions  
 DISTRIBUTING LLC  
 MAKERS OF  
**Wolverine Brand™**  
 ODOR CONTROL PRODUCTS



**We Stop The Stink GUARANTEED!**

In New Jersey  
**973-846-7817**

Outside New Jersey  
**866-667-8465**



[www.IndustrialOdorControl.com](http://www.IndustrialOdorControl.com)  
[www.StopSepticOdor.com](http://www.StopSepticOdor.com)



**NEW SRS CSU™**  
 Great for sampling by flow or by time.  
 A portable composite sampler unit with a 5 gallon iceable container, 12VDC Power supply, power cord, battery and charger.



**Other Products:**  
 SRS Corporation Stop Nozzle Assembly  
 SRS Disinfectant-Disinfect/Dechlorinate Water Mains  
 SRS Groundwater Monitoring Pump - Portable Pump For Checking Groundwater and Wells

Go to our web site for more details [srsnc.com](http://srsnc.com)

**SRS Systems, Inc.**  
**252.224.1990**

**FILL**  
*a job opening*

**BID OUT**  
*an upcoming job*

**ANNOUNCE**  
*contracted services offered*

**SELL**  
*used equipment*

**OBTAIN**  
*a position wanted*

**FIND** *what you're looking for!*

Reach over  
**70,000**  
 dedicated professionals  
 each month in TPO!  
**DON'T DELAY**  
 FAX completed classified form on page 42  
 to be included in the next available issue  
**715-546-3786**

TREATMENT PLANT OPERATOR  
**tpo**  
**CLASSIFIED ADVERTISING**  
 DECEMBER

**BLOWERS**

**VFC200P-5T, FUJI** Pumps, Regenerative Blowers, Ring Compressors. All models, accessories. Authorized distributor. Authorized parts and repair center. Call 888-227-9822. [www.carymfg.com](http://www.carymfg.com) (PBM)

**DEWATERING**

Septic Receiving Station, 10 gauge double wall stainless steel tank, w/4" flanged inlet. Wash assembly, 12" outlet, flow meter/plug valve rock trap stainless auger/brush and roll pins, stainless steel spray wash grinder, 12" cutting chamber, 7 tooth cam 4130 alloy steel, 5hp, 3.7kw 29:1 reducer controller, pc2450-100503, operator interface, panel heaters, billing card reader, receipt printer, emerg.stop button, connection to scada system, 2hp, 1.5kw, serial# 100503. Total flow meter. Contact Tim 832-473-7222. (CMP11)

Netzsch Plate Filter Press no. 1200/LP/III for sale. Excellent working condition with controls and documents. Automated plate open/close. New filter fabric, ready to install. Asking \$70,000. Call 717-587-1917 for details. (PT11)

**EDUCATION**

**RoyCEU.com:** We provide continuing education courses for water, wastewater and water distribution system operators. Log onto [www.royceu.com](http://www.royceu.com) and see our approved states and courses. Call 386-574-4307 for details. (O-02)

**WANTED**

**QUALITY SURPLUS POLYMER WANTED:** Email product number, polymer form, purchase date and quantity. Will attempt to make a cash offer. Also I can offer aggressive prices on our polymer sales to you. Email [stuart@acpsouth.com](mailto:stuart@acpsouth.com). (O-11)

**WATERBLASTING**

**Wheatley** 125 Detroit 10K @ 20GPM. **Wheatley** 165 10K @ 30GPM. **Gardner Denver** 450 Cummins 10K @ 42 GPM. **NLB** 10-600 Cummins 10K @ 104GPM. Hydroblast water recycle system. Reliable **John Deere** 10K @ 10GPM. T300 with Jetstream fluid end 10K @ 14 GPM. T450 with 8.2L GM 20K @ 14GPM. **Frontier** Pump 10K PSI @ 10GPM Detroit 3-53. **Bare-shaft** pumps available. **Boatman Ind.** 713-641-6006. View @ [www.boatmanind.com](http://www.boatmanind.com). (CBM)



**1. SEEPEX OFFERS INTEGRATED VECTOR-TYPE PUMP DRIVE**

The integrated vector-type, variable frequency drive from Seepex Inc. is made for metering and general transfer progressive cavity pumps. The drive integrates the pumps with a single reduction gearbox, a four-pole, TEFC and inverter-rated 1/2-hp electric induction motor in a Nema 4 enclosure. The pump and drive combination can cover a performance band of 0.08 gph to 4.7 gpm and pressures to 360 psi. The effective speed range is 20 to 600 rpm. The unit operates from standard 15-amp circuits with grounded plug. **937/864-7150; www.seepex.com.**

**2. GRIFFIN OFFERS NON-CLOG PUMPS**

Non-clog pumps from Griffin Pump & Equipment Inc. can deliver flows up to 17,000 gpm with head capacities of 240 feet. The impeller can handle stringy materials and 3-inch solids, while the large cleanout port facilitates debris removal without having to disassemble the suction pipe or hose. Options include vacuum assist or compressor prime, electric or diesel engines, internal fuel tanks for 24-hour operation, trailer mount and sound attenuation. **866/770-8100; www.griffinpump.com.**

**3. GENERAL MONITORS OFFERS HART-COMPATIBLE GAS DETECTOR**

The TS4000H intelligent toxic gas detector from General Monitors is HART communication compatible and monitors a variety of toxic gases, including ammonia, carbon monoxide, chlorine and more. The system displays gas concentrations up to 500 ppm, fault codes for troubleshooting, prompts when calibration is needed and provides complete status to the control room. **949/581-4464; www.generalmonitors.com.**

**4. McCROMETER INTRODUCES ULTRA MAG FLOW METER**

The Ultra Mag Flow Meter from McCrometer is a non-invasive, non-moving parts electromagnetic sensing instrument designed for inline installation. The meter delivers flow measurement accuracy of plus or minus 0.5 percent in water effluent with repeatability of 0.05 percent of actual flow. Designed for 2- to 48-inch lines, the meter measures flow from 0.2 to 49 fps at pressures of up to 300 psi and operates in temperatures up to 170 degrees F. **800/220-2279; www.mccrometer.com.**

**AQUIONICS INTRODUCES OPENLINE, AF3 UV TREATMENT**

The OpenLine Series and AF3 ultraviolet treatment systems from Aquionics Inc. feature low-pressure, high-output amalgam lamps that offer stable output over their operating life. The OpenLine Series is designed to treat secondary wastewater flows over a range of flows and UV transmittances, while the AF3 range of U.S. Environmental Protection Agency validated closed vessels offer a maximum lamp output of 500 watts. **859/341-0710; www.aquionics.com.**

**5. STACO OFFERS UNISTAR TOWER DESIGN POWER SUPPLY**

The UniStar P Series single-phase online uninterruptible power supply from Staco Energy Products Co. is available in 6-, 8- and 10-kVA tower design models. Designed to protect against outages and irregularities from 160- to 280-VA lines at 45-65 Hz, the towers can be installed in parallel for redundancy or additional capacity. **866/261-1191; www.stacoenergy.com.**



## BORD NA MONA OFFERS SUBMERGED AERATED FILTER

The PuraSAF Submerged Aerated Filter from Bord na Mona is an attached growth activated sludge process that uses a recycled plastic media as biomass carriers. Applications include use as a pre-engineered package system to provide effluent to secondary treatment standards, tertiary treatment to reduce ammonia on existing works or lagoon effluent, a temporary solution during planned refurbishment, as an emergency solution, or in an unaerated mode as a solids tertiary filter. **336/547-9338; www.bnm-usa.com.**

## 6. SIERRA INSTRUMENTS OFFERS HIGH-TEMPERATURE METER

The Steel-Trak 640S immersible thermal flow meter features a high-temperature option for operation in temperatures up to 750 degrees F. Made of 315 stainless steel wetted materials, the meter includes remote-mounted electronics and mineral-insulated cabling. The 3/4-inch-diameter sensor probe inserts into ducts and pipes up to 72 inches in size. **800/866-0200; www.sierrainstruments.com.**

## DETCO INTRODUCES MODEL 1000-H2S PROCESS ANALYZER

The Model 1000-H2S process analyzer from Detcon is designed to provide continuous, real-time measurement of hydrogen sulfide gas concentrations. The analyzer has a measurement range of 0-1,000 ppm with up to 2 percent standard and up to 5 percent with additional applications. Features include a 3-Electrode Electrochemical sensor element,

microprocessor-based signal-conditioning transmitter with local digital display, fault supervision, calibration mode indicator, 4-20 mA, alarm relays and RS-485 serial port outputs. **888/367-4286; www.detcon.com.**

## MACTEC UNVEILS CONFINED SPACE MANAGEMENT SYSTEM

The Confined Space Management System from MACTEC Engineering and Consulting Inc. is a Web-based application that enables shop supervisors, safety and bioenvironmental personnel to track activities and individuals within confined spaces. The ASP.NET application works within .NET Framework 2.0 and Oracle backend database. The system performs georeferences and defines a specific confined space, defines the type and hazards associated with a confined space, tracks the type of permits required to enter a confined space, tracks the type of personal protective equipment required to enter a confined space, tracks personnel training records and creates/tracks required permits. **770/360-0600; www.mactec.com.**

## ENBASYS INTRODUCES HIGH-LOAD, HYBRID BIOGAS REACTOR

The EnbaFerm high-load, hybrid biogas reactor from enbasys Biotech Energy is designed to treat large volume streams of organic waste and biofuel residues. The system offers low hydraulic retention time, prevention of foam and floating layers for higher loading rates, intense contact between substrates and microorganisms for rapid gas production, no chemicals or pH regulation and no accumulation of settling sediments for years of continuous operation. **www.enbasys.com.**

*(continued)*

## product spotlight

BioFuelBox  
mini-refinery from  
BioFuelBox Corp.

### Mini-Refinery Converts Fats, Oils and Grease into Biodiesel

By Ed Wodalski

The BioFuelBox mini-refinery from BioFuelBox Corp. converts fats, oils and grease from wastewater treatment plants into ASTM standard, low-sulfur premium B100 biodiesel. The FOG can come from grease trap waste delivered by pumpers, from scum in the clarification process or from algae in settling ponds.

There is no cost to the operator for the completely outsourced, on-site service. "We provide a service that includes all capital equipment, labor and energy," says Richard Reddy, vice president of marketing. "We basically drop a micro-refinery and a team of our people on site to convert this waste into biodiesel — at no cost to the treatment plant."

"We can sell that biodiesel back to the municipality at a discount. We are helping them get rid of a waste problem, and we are saving them money on what they normally pay for petroleum-derived diesel fuel. As a result, they are not only helping the environment by reducing waste, but are reducing carbon emissions by running the biodiesel in their vehicles."

Should municipalities decide not to use the biodiesel, BioFuelBox will sell it on the open market, sharing some of the profits with the treatment plant. The mini-refinery requires a total staff of five, which BioFuelBox provides. Storage requirements vary. Municipalities that use the fuel might need several tanks to do it before transfer to a fueling depot. If the fuel is sold, two or three 20,000-gallon tanks might be needed, and the company provides them.



Reddy says it takes about two weeks to get a system operational. A complete micro-refinery would occupy a 40- by 60-foot site. The plant consists of three 10-foot-square skids delivered by flatbed trucks.

"One of the great things about making energy from waste is that it allows you to be very competitive as the price of oil goes up and down," Reddy says. The system also works well with anaerobic digesters.

"We don't take all the material that the digester takes — just the lipid material," says Reddy. "And while you can put FOG into digesters, we're producing seven times the amount of energy from that same gallon of waste. Working in harmony with the digester is a very important part of what we do. We can work in synergy. Some of our byproducts can go into a digester as well, creating energy that can offset electricity at the plant."

**For information, call 888/383-5269 or visit [www.biofuelbox.com](http://www.biofuelbox.com).**

**7. HACH OFFERS NO MEMBRANE BOD MEASUREMENT TECHNOLOGY**

The LBOD dissolved oxygen measurement and reporting system from Hach Co. features an integrated motorless stirrer, requiring no membranes, electrolyte solution or anode to polish. **800/277-4224; www.hach.com.**

**8. EPG OFFERS LEVELMASTER LIQUID LEVEL MONITORING**

The LevelMaster Stand Alone liquid level monitoring system from EPG Companies monitors and displays liquid levels in sideslope risers, wells, tanks, sumps, reservoirs and settling ponds. The system includes components such as the EPG LevelMaster CH1000 Liquid Level Meter and LevelMaster Liquid Level Sensor. Monitoring systems are available with built-in, thermostatically controlled panel heaters to maintain minimum temperature, eliminating condensation and optimizing meter accuracy, extending life. Options include intrinsically safe circuitry, level sensors with additional surge suppression, Tefzel sensor cables, and a portable 12-volt version. **800/443-7426; www.epgco.com.**

**9. ASAHI/AMERICA INTRODUCES CPVC DISCS**

Designed for enhanced safety and performance in aggressive chemical environments, CPVC discs for Type 57 butterfly valves from Asahi/America Inc. are available in 3-, 4-, 6- and 8-inch sizes. **877/242-7244; www.asahi-america.com.**



**CAPSTONE METERING INTRODUCES INTELLIH2O WATER METER**

The wireless IntelliH2O intelligent water meter from Capstone Metering is designed to manage, control and conserve water using two-way, remote, upgradable communications software, eliminating hand-held or drive-by meter readings. Integrated into the Smart Grid, the system enables utilities to more accurately measure water usage. The meter also eliminates the need for routine battery replacement and allows departments to shut off a meter when a leak occurs. **972/446-1700; www.capstonemetering.com. tpo**



**CLASSIFIED AD FORM** Treatment Plant Operator

\$2.00 per word, per month. Please print ad legibly below with *correct punctuation* and *phone number*. Circle each word to be bolded, if any. (\$2.00 extra per bolded word)

**CLASSIFIED AD RATE**  
\$2.00 per word, per month, with a 20-word minimum or \$40.00. \$2.00 extra per bold word (key words only).



1-800-257-7222  
or 715-546-3346

---

---

---

---

---

---

---

---

---

---

**MAIL** this completed form with payment to:  
COLE Publishing Inc., PO Box 220, Three Lakes, WI 54562  
**FAX** this completed form to: **715-546-3786**

**CALCULATE THE AMOUNT DUE:**

\_\_\_\_\_ words X \$2.00 = \_\_\_\_\_ X \_\_\_\_\_ Months = \$ \_\_\_\_\_  
(\$40 minimum) (/# of months to run the ad) Total Amount Due

**ADVANCE PAYMENT REQUIRED**  
No billing for classified ads. Payment must be received in advance before publishing.

COMPANY NAME: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_ PHONE: \_\_\_\_\_  
CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

**FASTEST SERVICE**  
FAX this completed form to  
**715-546-3786**

PLEASE FILL OUT CREDIT CARD INFORMATION COMPLETELY INCLUDING V-CODE (3-DIGIT NUMBER FOUND BY YOUR SIGNATURE)

CREDIT CARD NO.: \_\_\_\_\_ V-CODE: \_\_\_\_\_ EXP. DATE: \_\_\_\_\_  
CARDHOLDER NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_



water treatment to the mix. So far we have focused on the municipal side, but if interest from the industrial community persists or grows, we may need to re-evaluate. So those are some potential areas for improvement. And with that, a few questions for you.

- What specifically do you like best about *TPO* so far?
- What are we not writing about that we should be? Are we neglecting some important area of the treatment field?
- Is there anything we've been including that you *don't* consider valuable?
- In general, what can we do to make *TPO* better?

We wouldn't ask these questions if we didn't truly want to know the answers. So drop a note and share your thoughts with us.

My guess is that operators hold back for two main reasons. One is that you're busy people. The other is that as a group, you're not inclined to blow your own horn. And my answers are: It takes very little time to send a story lead. And by doing so, you help others in your business — you're not just showing off.

### IT'S ABOUT YOU

And speaking of notes, the ones we like best are those that alert us to potentially interesting stories. We wish we would get more of those. My guess is that operators hold back for two main reasons. One is that you're busy people. The other is that as a group, you're not inclined to blow your own horn.

And my answers are: It takes very little time to send a story lead. And by doing so, you help others in your business — you're not just showing off. What does it take to submit an idea? Just a quick e-mail, or a phone call. Nothing fancy whatsoever.

On hearing your suggestion, we'll probe a little deeper to see if your story seems valuable to other operators or plant managers and supervisors. If so, we'll most likely assign a writer to work with you.

What kinds of stories are we looking for? You see them in the magazine every month. Here are some of the regulars:

- **Greening the Plant:** What are you doing to make your operations more environmentally friendly?
- **PlantScapes:** Do you have any interesting landscaping or signage that makes a great impression on your community?
- **Hearts and Minds:** What are you doing to get the public on your side or to draw attention to the profession as a great career choice for young people?
- **How We Do It:** Have you found an interesting answer to a nagging problem? Has a new technology helped you make a big improvement in some area?
- **Worth Noting:** Have any of your people won awards lately? Earned new certifications? Reached significant service milestones (10, 20, 30 years)?

## Keep *TPO* Coming!

It's time to become an official member of the *TPO* family by qualifying your subscription.

It's easy. Go to [www.tpomag.com](http://www.tpomag.com) and subscribe, or fill out and mail back the subscription card that's stitched into the magazine.

Your **FREE subscription** will make sure you continue receiving *TPO* and all the news and information it delivers every month.



### DROP A LINE

We're open to ideas in those areas, and in others you suggest. Consider making a New Year's resolution to contact *TPO* at least once with an idea, or just a comment on how we're doing. It's the best possible way to help us serve you, and your tens of thousands of fellow professionals.

Please start by contacting me at [editor@tpomag.com](mailto:editor@tpomag.com), or by a toll-free call to 877/953-3301. I look forward to hearing your thoughts and ideas and to making the next year of *TPO* even better than the first. **tpo**

## Coagulants and Flocculants

for Septic, Grease, Municipalities and Industry

Save Money • Save Time • Save Polymer

- Dewatering polymers for all dewatering equipment
- All forms: Dry and Emulsion
- Variety of packaging sizes to meet customer needs
- Both East & West coast shipping points
- Expert technical staff
- Specific solutions for our customers

Call Toll-free:  
877.771.6041

Aqua Ben Corporation

1390 N. Manzanita St. • Orange, CA 92867  
[www.aquaben.com](http://www.aquaben.com) • [sales@aquaben.com](mailto:sales@aquaben.com)

# COMPACT CABINET COOLER

for sealed electrical enclosures

REMOVE WASTE HEAT  
WHILE KEEPING  
CONTAMINANTS OUT

NOREN ENGINEERING & MANUFACTURING

norenproducts.com/cc

650.322.9500

# Flash of Inspiration

AN ANIMATION PROGRAM FOR LOCAL SCHOOLS IS AT THE HEART OF PUBLIC EDUCATION EFFORTS AT THE GUADALUPE-BLANCO RIVER AUTHORITY

By John K. Thompson

**C**urtis Davis, chief plant operator at Victoria (Texas) Regional Wastewater Treatment Center, and Cinde Thomas-Jimenez, education coordinator for the Guadalupe-Blanco River Authority (GBRA), collaborate to promote public education about how to protect precious water resources.

Located near the meandering banks of the Guadalupe River, the Victoria plant sits 30 miles inland from the Gulf of Mexico and within a two-hour drive of Corpus Christi, Houston, San Antonio, and Austin. Known as The Crossroads, Victoria is a regional hub for a seven-county area with more than 250,000 people.

Davis and Thomas-Jimenez are part of a GBRA effort to help the public get the big picture about the role treatment plants play in community clean-water infrastructure. "Cinde gets the word out to a lot of important organizations that we don't often get a chance to connect with easily," says Davis. "She starts with the legwork involved in getting our tours set up. Once she's completed her pre-tour activities such as visiting schools, then I try to get them up close to the on-site action at the plant."

## IN A FLASH

Their collaborative work provides a vital link between plant operations and schools. Thomas-Jimenez worked with graphic artist Scott Rolfe to create a multimedia project that leads viewers through areas of the household where wastewater originates. The program shows uses and misuses of water in the home.

Members of the GBRA team: from left, Cliff Prout, Robert Foley, Dennis Gunter, Wendell Gillit, Bill Young, Curtis Davis, Terry Ramey, Carlton Hoefling, Ross Chapman, Lorenzo Gonzales, Keelyn Underwood and Frank Tompkins. Not pictured are Frank Ceballos, David Weaver and Sara Vazquez.



PHOTOS COURTESY OF CURTIS DAVIS

Cinde Thomas-Jimenez, education coordinator for the Guadalupe-Blanco River Authority.

## What's Your Story?

**TPO welcomes news** about your public education and community outreach efforts for future articles in the Hearts and Minds column. Send your ideas to [editor@tpo.com](mailto:editor@tpo.com) or call 877/953-3301.

Using Flash animation, they can transmit plant management concepts to off-site classroom computers in area schools. "Our GBRA Wastewater Treatment Flash animations were developed with the assistance of many of our plant operators," says Thomas-Jimenez. "They reviewed them during development and gave us their input. This was important to me as an educator because they are the experts, and their input gives our presentations to the public more validity."

She likes the video on-demand quality of the animations. "The Flash format is a very friendly animation format for computer users, and most computer systems will support its use," she says. "Our animations are pulled up for users directly from our Web site. All they need is the Adobe Flash Player or a Flash plug-in for their browser."

## DEALING WITH DISTANCE

Thomas-Jimenez and Davis keep the focus giving the public a window into the world of wastewater treatment. "When a school group calls and requests a tour, I work closely with the teacher to make sure they have covered the basic concepts of wastewater plant operations before they arrive at the plant," Thomas-Jimenez says.

"If possible, I go to the school ahead of time to show the students the animation and answer any questions. If my schedule does not allow a visit, I encourage them to present the animations to the students in class.

"We've found that the animations work as an effective virtual tour. After viewing it, students are familiar with the terminology, processes, and various treatment steps. That makes their tour more meaningful. Students are less overwhelmed by the terms and processes when they arrive. They are free to ask questions of the expert tour leaders, and ask the plant operators more specific questions."