

TREATMENT PLANT OPERATOR

tpo™

DEDICATED TO WASTEWATER & WATER TREATMENT PROFESSIONALS

www.tpomag.com
JULY 2014

**Sustainable Operations:
Fuel cell energy in
Orange County, Calif.**

PAGE 30

Upgrades on the Fly

**COHASSET OPERATORS ARE ADEPT
AT TROUBLESHOOTING AND FIXING ISSUES**

PAGE 16

**Technology Deep Dive:
BurstMinder for water mains**

PAGE 44

**Hearts and Minds:
Education advice
from Scotland**

PAGE 22



Mark Cataldo
Project Plant Manager
Cohasset, Mass.

INTRODUCING YASKAWA'S NEW LINE OF **MEDIUM VOLTAGE DRIVES**

BIG BROTHER



Introducing the MV1000 medium voltage drive from Yaskawa - the big brother to our already proven low voltage drive technology.

Built off the same control architecture as our world-class A1000 low voltage drive line, the MV1000 offers best-in-class technology with the lowest line harmonics impact, most motor-friendly output and longest service life of any medium voltage drive.

The MV1000 is available in 2.4kV and 4.16 kV models in 4 different frame sizes with outputs ranging from 200HP to 5000HP. It is particularly well-suited for equipment upgrades and energy savings initiatives.

Installation friendly • Proven reliability • High performance • Compact design • User friendly



YASKAWA AMERICA, INC.
DRIVES & MOTION DIVISION
1-800-YASKAWA | YASKAWA.COM



©2014 Yaskawa America Inc.



For more info:
<http://Ez.com/yai634>



Get personal with Yaskawa.
Call John Merrison today.
1-414-856-2496

IT'S PERSONAL
YASKAWA

WHY NIBBLE WHEN YOU CAN MUNCH?



EZstrip™ TR Muncher®

1936 was a good year for progressing cavity (PC) pumps. We started manufacturing PC pumps in the United States, and since then, Moyno has added industrial grinders providing reliable, effective maceration of solids to protect downstream equipment from blockages. We're proud of the new, innovative designs like the EZstrip TR Muncher—quick, simple, maintain-in-place solution making your job easier.

Learn more at www.moyno.com/EZstrip

At the Heart of American Ingenuity.

MOYNO™



TR Muncher
offers different
cutter thickness
to match the
required particle
size for application.
A quick release
access port allows
in-place inspection
and cutter stack
replacement.

 **Mono**

Planning a Retrofit? The Choice is CLEAR.

We upgrade existing aeration systems to provide easy process control and low maintenance.

- Aire-O₂ Triton®: ideal for oval/ditch and aerobic digester retrofits
- New mixer retrofit kit easily mounts on existing submersible mixer rails
- Rentals available

















Aeration Industries®
www.aireo2.com • 1-800-328-8287

©2014 AII LLC, All Rights Reserved.

advertiser index

JULY 2014

Aeration Industries International .. 4	Grace Industries, Inc. 45
 Aerzen USA 31	HUBER TECHNOLOGY Huber Technology, Inc. 7
 AllMax Software, Inc. 4	INFILCO INFILCO DEGREMONT 13
American Water Works Association..... 41	 Keller America Inc. 67
 AQUA-Zyme Disposal Systems, Inc. 28	 Komline-Sanderson 65
ASCO Numatics 15	Moyno 3
 BioTriad Environmental, Inc. 28	PCM USA INC 8
 Blue-White Industries 11	 Penn Valley Pump Co., Inc. 27
 Carylon Corporation 51	Pollardwater Pollardwater 5
 ClearSpan Fabric Structures 23	Pulsar Process Measurement Inc. 19
Data Flow Systems 13	 Smith & Loveless, Inc. 21
 Environmental Dynamics International 43	USABlueBook 68
FPZ, Inc. 59	 Vaughan Company, Inc. 39
 Gorman-Rupp Company 29	Walker Process Equipment, A Div. of McNish Corp. 23
	Weir Specialty Pumps (WEMCO) 33
	Yaskawa America, Inc. 2
	YSI, a Xylem brand 9
	CLASSIFIEDS 65

O&M Software Data Management Solutions

Operator10®
Water



Operator10®
Wastewater



Synexus™
Pretreatment



Antero™
Maintenance



20 YEARS
Specializing in Software & Service

AllMax
Software

800-670-1867 www.allmaxsoftware.com/tpo

It's your magazine. Tell your story.

Send your ideas for future articles
to editor@tpomag.com

Get
Social
with
tpo

www.facebook.com/TPOMag
www.twitter.com/TPOMag
www.plus.google.com
www.youtube.com/TPOMagazine
[www.linkedin.com/company/
treatment-plant-operator-magazine](http://www.linkedin.com/company/treatment-plant-operator-magazine)



wwett
Water & Wastewater Equipment,
Treatment & Transport Show

Water & Wastewater Equipment,
Treatment & Transport Show
www.pumpershow.com

Education Day: Feb. 23, 2015 ■ Exhibits: Feb. 24-26, 2015
Indiana Convention Center, Indianapolis, Ind.

Pollardwater

The Professional's Choice...for Water and Wastewater Treatment



norweco

CAPTOR

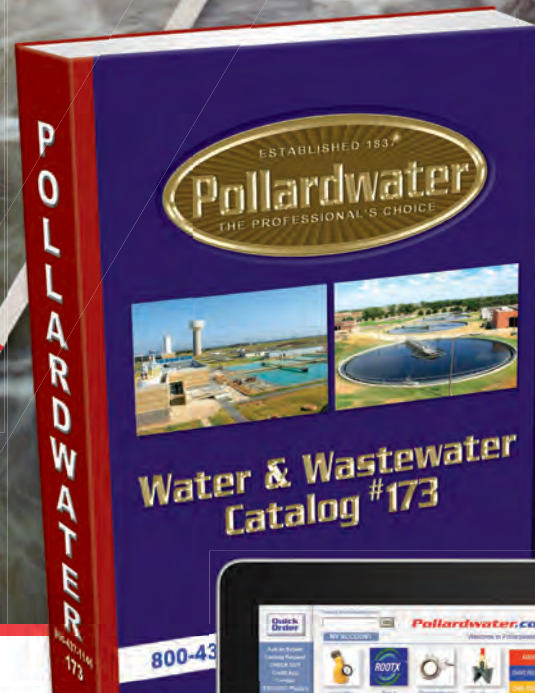
VITA-D-CHLOR

LPD-CHLOR



SludgePro XL

Buy it online anytime and request your **FREE** catalog or give us a call, we're here to help!

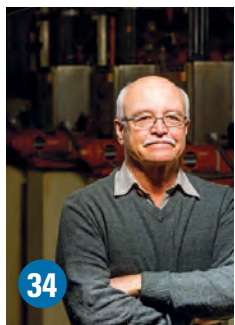


Kasco
Marine, Inc.



Since 1837

800-437-1146 • www.pollardwater.com



on the cover

Mark Cataldo, chief operator at the Cohasset (Mass.) Wastewater Treatment Plant, teams with Tim Swimm, operations and maintenance technician, to keep operations humming. The two take pride in getting quickly to the root of problems and making effective fixes. (Photography by Ed Collier)

top performers:

WASTEWATER PLANT

Upgrades on the Fly Page 16

Operators at the treatment plant in Cohasset, Mass., have become adept at troubleshooting and fixing issues quickly and effectively.

By **Scottie Dayton**

WATER OPERATOR

Chance of a Lifetime Page 24

Ken Reynolds welcomed a challenge and led his team through a transition from an aging conventional plant to a sophisticated membrane facility.

By **Ted J. Rulseh**

WASTEWATER PLANT

Hitting the Curveballs Page 34

An award-winning Massachusetts plant team creatively tackles challenges ranging from upstream industrial discharges to tightening effluent nitrogen limits.

By **Jim Force**

WASTEWATER PLANT

Judge This Book by Its Cover Page 46

Steady improvements keep a small secondary plant in Texas compliant with regulations and in peak operating condition despite budget limitations.

By **Jim Force**

LET'S BE CLEAR Page 8

Toward a Closer Community

Starting with this issue, *TPO* magazine expands its mission to include the industrial wastewater and drinking water sides of the treatment profession.

By **Ted J. Rulseh, Editor**

THE FIRE CHIEF PROJECT Page 10

Idea of the Month: Being a Great Host

Plant tours can be among your best ways of getting your message to the public. Here's some advice for conducting them successfully.

By **Marcel Tremblay**

LETTERS Page 12

@TPOMAG.COM Page 14

Visit daily for news, features and blogs. Get the most from *TPO* magazine.

HEARTS AND MINDS Page 22

Winning With Winnie

Scottish Water opens eyes, and sewer pipes, with a multimedia campaign that tells consumers what not to flush and the trouble improper disposal can cause.

By **Craig Mandli**

SUSTAINABLE OPERATIONS Page 30

Three for One

A demonstration project at Orange County Sanitation District tests the viability of using a fuel cell to generate electricity, hydrogen fuel and heat.

By **Doug Day**

PLANTSCAPES Page 32

Treatment With Trees

A poplar plantation at an Oregon treatment plant saves on infrastructure costs and creates an aesthetically pleasing environment on neighboring land.

By **Jeff Smith**

IN MY WORDS Page 40

Up From Under

A Colorado sanitation district partners for a sustainable approach to managing produced water from the region's oil and gas fields.

By **Ted J. Rulseh**

HOW WE DO IT: WASTEWATER Page 42

On Autopilot

A test of a real-time nitrogen control documents substantial energy savings and improves process consistency at a Michigan clean-water plant.

By **Scottie Dayton**

TECHNOLOGY DEEP DIVE Page 44

Fast Alerts for Broken Pipes

A flow- and pressure-sensing technology with time synchronization helps water systems quickly detect and minimize losses from bursts in distribution mains.

By **Ted J. Rulseh**

PRODUCT FOCUS Page 52

Pumps, Drives, Valves and Blowers

By **Craig Mandli**

CASE STUDIES Page 58

Pumps, Drives, Valves and Blowers

By **Craig Mandli**

PRODUCT NEWS Page 62

Product Spotlight: Chlorine analyzer reduces reagent consumption

By **Ed Wodalski**

INDUSTRY NEWS Page 63

WORTH NOTING Page 64

People/Awards; Education; Events

coming next month: August 2014

Product Focus:

Headworks/Biosolids Management

- » Let's Be Clear: The reclamation imperative
- » Top Performer – Biosolids: Biocycle Farm in Springfield and Eugene, Ore.
- » Top Performer – Operators: Jennifer Baca/Chris Lopez, Los Alamos County, N.M.
- » Top Performer – Plants: Efficiency improvements in Winterhaven, Fla.
- » How We Do It: Water efficiency software in Oakland, Calif.
- » Sustainable Operations: Cutting energy costs in Blaine, Wash.
- » PlantScapes: Wetland treatment park in Orlando, Fla.
- » Technology Deep Dive: New online chlorine analyzer
- » Tech Talk: Eye on dioxane

Looking *for*
a *reliable*
**SCREENINGS
WASHPRESS?**

you **FOUND IT!**

WAP Series Screenings Washpress

- Excellent compaction & dryness
- Fully automatic and reliable operation
- Robust all stainless construction
- Four model ranges for a tailored fit

Learn more at
huberforum.net/WAP

solutions@hhusa.net • 704.990.2054

SOLUTIONS FOR:



SCREENING



GRIT



SLUDGE

HUBER
TECHNOLOGY
WASTE WATER Solutions

let's be clear

Abrasive sludges, fragile polymers ? PCM, keep it moving !



PCM EcoMoineau™ M
Able to handle the toughest applications

From the inventors of Progressing Cavity Pump technology and more than 80 years of innovations.

Lower energy consumption

3 screws to complete maintenance
Patented Connecting system
Easy dismantling

Reduced footprint

Standard Hand-holes

Longer lasting components

For inquiries, please contact
PCM USA Inc. in Houston:
+1 (713) 896-4888
www.pcm.eu

ASSEMBLED IN USA

PCM | keep it moving

Toward a Closer Community

STARTING WITH THIS ISSUE, *TPO* MAGAZINE EXPANDS ITS MISSION TO INCLUDE THE INDUSTRIAL WASTEWATER AND DRINKING WATER SIDES OF THE TREATMENT PROFESSION

By Ted J. Rulseh, Editor



COLE Publishing launched *Treatment Plant Operator* magazine in 2009 to serve the operations side of the wastewater treatment profession. We started *Water System Operator* in 2012 to serve operations people on the drinking water side.

Now, after 2 1/2 years of publishing both magazines, we see advantages in making them one. Therefore, as of this month's issue, we're expanding *TPO* to encompass the entire community of treatment plant operators — wastewater and drinking water. We'll also be stepping up coverage of industrial wastewater.

IT'S A NATURAL

We think this change makes sense on various levels because, increasingly, we find that water and wastewater are simply different sides of the same coin. Consider:

- Most communities have both water and wastewater utilities. They provide water and wastewater treatment. They bill together for water and sewer service.
- Many people who operate drinking water and wastewater treatment plants have dual licenses. They may work full-time on one side, but they're licensed for the other. Especially in smaller towns, operators actually work both sides or help the other side in a pinch.
- Many readers of this magazine were also readers of *WSO* — and vice versa.
- Some state and regional WEA chapters and American Water Works Association sections hold joint training events and conferences. And industrial operators are very much a part of wastewater operator organizations.
- Most manufacturers that offer products for one side also offer products for the other. Many exhibit at both the WEFTEC and ACE (drinking water) trade shows.

Perhaps most basic of all, water and wastewater treatment are different components of the same urban water cycle.



DEDICATED TO WASTEWATER & WATER TREATMENT PROFESSIONALS

Published monthly by COLE Publishing, Inc.

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

Call toll free 800-257-7222 / Outside of U.S. or Canada call 715-546-3346

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

Website: www.tpomag.com / Email: info@tpomag.com / Fax: 715-546-3786

SUBSCRIPTION INFORMATION: A one year (12 issues) 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. To subscribe, return the subscription card attached to each issue, visit tpomag.com or call 800-257-7222.

Non-qualified subscriptions are available at a cost of \$60 per year in the United States and Canada/Mexico and \$150 per year to all other foreign countries. To subscribe, visit tpomag.com or send company name, mailing address, phone number and check or money order (U.S. funds payable to COLE Publishing Inc.) to the address above. MasterCard, VISA and Discover are also accepted. Include credit card information with your order.

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 email nicolel@colepublishing.com. Include both old and new addresses.

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 Nicole at nicolel@colepublishing.com.

ADVERTISING RATES: Call 800-994-7990 and ask for Phil or Kim. 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 to Editor, *TPO*, P.O. Box 220, Three Lakes, WI, 54562 or email editor@tpomag.com.

REPRINTS AND BACK ISSUES: Visit www.tpomag.com for options and pricing. To order reprints, call Jeff Lane at 800-257-7222 (715-546-3346) or email jeffl@colepublishing.com. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicolel@colepublishing.com.

CIRCULATION: 72,241 copies per month.

© 2014 COLE PUBLISHING INC.

No part may be reproduced without permission of publisher.



INTERESTS IN COMMON

So what does this mean to readers of *TPO*? It means you get all the material you're used to — and more. The articles focused on drinking water and industrial treatment are largely in addition, not in place of. We believe the expanded and more diverse subject matter will help everyone.

After all, water and wastewater operators share basic functions: pumping, treatment, disinfection, residuals management. They also share the fundamental concerns: compliance, service quality, efficiency, public health, energy conservation, environmental protection. As such, they can learn from each other across disciplines.

Energy-saving tips from a wastewater treatment plant may apply just as well to a drinking water plant. A public outreach program for a drinking water utility may contain lessons and best practices that apply just as well on the wastewater side. While the processes are different, the overall intentions are largely similar. The expanded *TPO* will reflect that.

For example, energy-saving tips from a wastewater treatment plant may apply just as well to a drinking water plant. A public outreach program for a drinking water utility may contain lessons and best practices that apply just as well on the wastewater side. While the processes are different, the overall intentions are largely similar. The expanded *TPO* will reflect that.

COME ALONG FOR THE RIDE

In this magazine, you'll continue to see profiles of top-performing operators, treatment plants and utilities. There will be news of the latest products and in-depth reports on exciting technology offerings. We'll report on plant sustainability initiatives, share technical advice from experts, and present case studies on successful product installations. In other words, everything you've come to expect in *TPO*, in a larger and broader context.

So, I hope you will join us on the two-way street that is water and wastewater treatment. I've been editing *TPO* for almost six years now, and I'm excited about its expanding mission.

As always, your cards, letters, calls and electronic messages will be welcome. In fact, if you have a comment, question or story to share right now — or if there's anything at all you'd like to discuss, send me a note to editor@tpomag.com.

Let's continue our journey and welcome new groups of travel companions. **tpo**



a xylem brand

Wastewater process control – easier than you think.

The YSI IQ SensorNet is a water quality monitoring network that's incredibly flexible, easy to use, and ideal for any size facility. Just set it up and turn it on.

Monitor and Control Your Process from Start to Finish:

The 2020 XT measures up to 20 parameters. The 182 monitors 1 to 4 parameters. Quickly add or change sensors any time to any location.

And choose from DO, pH, TSS, NH₄, BOD, COD, sludge level sensors and more. UltraClean technology keeps many sensors clean without regular maintenance.

Orthophosphate analyzer also available.

IQ SensorNet 2020 XT



YSI.com/IQ
+1 937 767 7241
800 897 4151 US

xylem
Let's Solve Water

TREATMENT PLANT OPERATOR

tpo It's your magazine.
Tell your story.

TPO welcomes news about your wastewater or water treatment operation for future articles.

Send your ideas to editor@tpomag.com
or call 715/277-4094

Being a Great Host

PLANT TOURS CAN BE AMONG YOUR BEST WAYS OF GETTING YOUR MESSAGE TO THE PUBLIC. HERE'S SOME ADVICE FOR CONDUCTING THEM SUCCESSFULLY.

By Marcel Tremblay

Many operators cringe at the thought of conducting plant tours. Images of 100 third-graders running amok around dangerous equipment race through their heads. Or maybe worse, skeptical ratepayers show up with odor complaints.

Either way, plant tours can be a source of anxiety. But the reality is you can enjoy plant tours and embrace the opportunity to forward your cause. A large percentage of average folks have little or no idea what goes on at a treatment facility, so the element of surprise works in your favor.

The key is preparation. Your first consideration is the safety of your group. Second, you want your tour to be interesting and informative. Third, you want to make a good impression. Thorough planning of content and execution will ensure that your tour is a memorable learning experience.

CONSIDER THE AUDIENCE

Plan your tours based on the group demographic. You would not give the same presentation to third-graders as to a new town manager.

For the younger set — say, grades three to five — you want to portray wastewater treatment as a natural part of everyday life. At that age, kids are fascinated with new, unusual, and yes, gross things. I get more “oohs and aahs” from this age group by picking up a shovelful of grit than from demonstrating some electronic wizardry. It’s important to instill in kids that when we flush the toilet or use water in any way, a fascinating process begins. They may not understand all you show them, but at the least you will reveal to them a reality of life they had not encountered.

Middle school children can be a challenge. Sensationalize the facts if you can. Tell them how many miles of pipe are in the collection system. Say your standby generator has the horsepower of five muscle cars. Use comments that spur the imagination: “Can you imagine how much water flows through that 48-inch pipe? You could fill a swimming pool in five minutes!”

High school and college students are likely to care about opportunities the industry could hold for them. Explain the industry’s diversity. After the

Consider using different presenters for different parts of the tour. A new personality keeps things fresh. Especially with older groups, you’ll want the person most experienced in a particular process to present that part of the tour.

tour, conduct a session over snacks with a PowerPoint presentation or drawings on a grease board. Encourage questions and discussion. Mention that the industry has a rock-solid future, with an aging work force.

ATTEND TO THE BASICS

No matter who is touring, you’ll need some basic preparations. Again, safety first. Slips, trips and falls are the most common accidents in the industry. Make sure floors are dry, cordon off dangerous areas, and keep all areas well lit. If youngsters are visiting, make sure there are enough chaperones. Protective eyewear and hardhats enhance safety — and make kids feel a little like big shots.

Most tour groups are surprised at how little the smell bothers them. I make an exception for grit removal systems. Well before the tour, open all doors and run the ventilation fans. Or just stand in front of the structure (upwind



if possible) and point out the machines through the open doors.

Follow the flow of the plant as much as possible: This helps your audience understand the treatment process and see the water quality sequentially improving. Have imhoff cones and settleometers set up at the various stages, showing samples before and after. It can be interesting to show offline process equipment: It helps them to visualize the size and the inner workings of the process.

PRACTICE MAKES PERFECT

Make a few dry runs before hosting a group. Practice your presentation at each stage of the process. Note additional information you may want to share, based on how attentive your group seems to be. Avoid rambling about some detail if your group seems bored. Punctuate the highlights of each stage, then move on.

Consider using different presenters for different parts of the tour. A new personality keeps things fresh. Especially with older groups, you’ll want the person most experienced in a particular process to present that part of the tour.

On the day of your tour, dress neatly. Avoid overbearing cologne. Make sure your breath is minty-fresh. Speak loudly and clearly, and make eye contact with everyone as you go along. Welcome questions, and smile a lot.

The best plant tours are well prepared, yet don’t feel too regimented. A couple of humorous anecdotes can’t hurt. Know your material, and relax. Conduct yourself professionally, but remain approachable. Remember that you are a diplomat of sorts, and maybe an inspiration for the next shining stars in our industry.

ABOUT THE AUTHOR

Marcel Tremblay is chief operator at the Massachusetts Correctional Institution Concord Wastewater Treatment Plant in Concord, Mass. He can be reached at martremcheerful@yahoo.com. tpo



ProSeries-M[®]

PERISTALTIC METERING PUMPS



Proseries-M Metering Pumps are well suited to pumping a wide range of aggressive and viscous chemicals used in water and wastewater treatment. The operator simply changes the pump tube assembly to the appropriate material for the chemical being injected. This permits standardization to a single pump model for several different chemical applications. Proseries-M Peristaltic Metering Pumps are currently offered in three models, providing a wide range of feed rates and capabilities; M-2, M-3 and M-4.

- ◆ Feeds range from as low as .0002 GPH / 2.10 LPH up to 158.5 GPH / 600 LPH. Maximum pressure 125 psi / 8.6 bar.
- ◆ Exclusive, Patented Peristaltic Pump Safety Switch – Pump only operates in maintenance mode while front cover is removed, helping to protect operator safety.
- ◆ Exclusive, Patented Tube Failure Detection (TFD) system.
- ◆ Multiple signal inputs and outputs.
- ◆ 5 Year Comprehensive Warranty.

Manufacturing

Quality Metering Pumps, Flowmeters and Water Treatment Accessories for more than Five Decades

Blue-White Industries

5300 Business Drive, Huntington Beach, CA 92649 USA

714-893-8529 • fax: 714-894-9492 • sales@blue-white.com

www.proseries-m.com • www.blue-white.com

for WATER & WASTEWATER TREATMENT

IP66
NEMA 4X
WASH/DOWN

TFD system
Tube Failure Detection

NSF
Standard 61

CE ETL

weftec 2014
DIAMOND SPONSOR

Hiring former convicts

The decision to engage in a criminal act carries many repercussions and having to acknowledge a prior conviction on a job application is just one example (“Building a Bridge,” *Water System Operator*, April 2014). That said, the case for forgiveness and the opportunity for a second chance is strong, as sometimes it takes a major setback to get one’s life back on the right track.

Whether it be the water industry or any other workplace environment, I’d bet an employee could be found with a clean record who is a constant sore spot for management and co-workers due to work ethic, attitude or a host of other reasons. Some would say that such a person’s presence at work is a criminal act in itself.

From the business world to the entertainment world, there are many stories of lives that were turned around. If an opportunity arose to hire someone who humbly comes before you admitting a past mistake, yet exhibits a strong work ethic and desire to gain more knowledge, why not contemplate affording that person a chance during the interview process. A carefully thought-out series of questions, along with your intuition, can go a long way toward making the final selection a correct one.

Gregory V. Henderson
Assistant Superintendent
Vineland (N.J.) Municipal Utilities – Water Division

A better name

I have been working with water for nearly eight years and for a municipality for about four. Thus far, being a treatment operator (a little less than two years) has been the highlight of my career. It is a fulfilling job that has lots of career potential. It is more of a specialist-type job, in my opinion. There is a set of very specific guidelines that we are required to adhere to, and there are licenses that the state requires.

Arlington is a leader in the water industry and has taken steps recently to start fashioning my position into something a little more desirable. For one, they have started hiring operators at the median of the listed salary range, or 100 percent, for a base treatment technician job. This is just the first patch in a process to limit the amount of turnover that has plagued this position.

The good hourly wage actually brought me back to treatment from another position at a supervisor level because I enjoyed the job so much and it allows more freedom than many jobs. I work a straight eight hours and I’m done. College is also back on the table for me because I work an evening shift that will allow for school/study during the day and family time on my days off at home.

In the works is a plan to allow for promotions or levels of treatment technicians. Currently there are only three — T5 treatment tech trainee, T6 treatment technician, and T8 chief treatment technician. The idea is that as we get better licenses and are blessed as competent in other specific aspects of the job (such as flocculation, instrumentation, distribution, monthly operating reports and several others) we get promoted to the next level.

There would be a T7 position put in place for the B license people. It would break down so that T5 requires a D license, up to the T8, requiring an A license, plus proficiencies. At the top you can expect an attractive hourly salary, plus overtime that is often available.

Beyond changing the structure for advancement there is management above that, and the other fields one can pursue after learning the trade. Instrumentation, pump repair, engineering, electrical and consulting are some of the profitable careers that being a treatment operator can lead to.

In my opinion, the operator position does need to be changed to specialist and given more responsibility. The idea I have will save overhead cost and allow even higher pay. There are many positions that keep our treatment facility running. We have two treatment plants, each with its own maintenance staff of four or five (one lead and a crew).

There is an electrical team that is designed to have three people (a lead and two journeymen). We also have a SCADA team that is supposed to have two people but never does because it is hard to match the private sector salary of a SCADA/PLC programmer. There is also a treatment operations administrator who currently handles the monthly state paperwork and oversees the operations team. Then there are two managers, one for each treatment plant, and one administrative professional between them.

My thought is to cut out many of those positions and move them to a treatment specialist position and provide the training needed to do all those necessary jobs. It would create more well-rounded employees and allow them to attain positions worth paying a wage that would attract more people.

I understand that programming a PLC is an advanced skill. Make it a top-tier level that a treatment specialist can reach and contract someone to do the work with the money saved by merging the different divisions of treatment together. Plus, with all the staff working, overtime would be minimized.

It may even be possible to correct the other issue with working in treatment: the hours. It’s a 24/7 operation, and that is not appealing to many people. Currently, my days off are Wednesday and Thursday, plus I work an eight-hour evening shift from 3 p.m. to 11 p.m. If there were enough staff, it would be possible for everyone to have a weekend day off, or rotating days. However one arranges the schedule, it would be easier to do with more staff.

Linden Shultz
Treatment Technician
Water Utilities Department
Arlington, Texas

Don’t be grandiose

When I was a boy in elementary school, we jokingly referred to the garbage man as a “sanitation engineer.” Today, the minimum-wage temp who answers your call to customer service and reads through a script is typically called something like “customer satisfaction specialist/technician.”

We who are water professionals want (I hope) to avoid such grandiose self-parody. In my opinion, the terms “water distribution operator” and “water reclamation operator” work just fine for describing who we are and what we do.

I have never minded being called a wastewater operator, and I am proud to be one. I am always happy to explain what that is and what I do. However, my experience has been that no matter what you call it or how you describe it, the general public is just not interested. Potable water is just what comes out of the tap, and how exciting is that? Much of the general public wouldn’t even know the meaning of the word “potable.” Wastewater is icky, and who wants to talk about poo and pee water?

Many water professionals know we need to better educate the public about water resource use and reclamation, but you can’t teach people anything they just aren’t interested in. People in general can’t be bothered to care about something they have been able to take for granted all their lives. I’m afraid they will be interested in what we do only when they realize that plentiful, potable water is not something they can take for granted anymore, as something cheap to the point of being virtually free.

I’ve been saying for years that it is long past time to stop artificially suppressing the true cost of water and to assess water and sewer rates based on

Boost Your Productivity in Sludge Dewatering

Dehydris™ Twist Boosted Sludge Dewatering Using Piston Press Technology

- Combines plate filter press efficiency and centrifugal productivity
- Easy operation and high performance
- Achieve up to 40% dry content through an entirely automated process from mixed digested sludge
- Up to 30% reduction in sludge bulk compared to conventional dewatering

INFILCO

Infilco Degremont, Inc. – 8007 Discovery Drive, Richmond, Virginia 23229 • (800) 446-1150

www.degremont-technologies.com

A partnership with Bucher Unipektin



HEADWORKS | BIOLOGICAL | SEPARATIONS | MEMBRANES | OXIDATION DISINFECTION | **BIOSOLIDS** | INDUSTRIAL SYSTEMS

what is truly necessary to construct, maintain and operate the necessary infrastructure. I am ready to put my money where my mouth is: I would gladly pay double what I now pay for my water bill to make sure we provide for the water and wastewater infrastructure repairs this nation so desperately needs, and for the future construction, maintenance and operation of those systems. It would still cost considerably less than half of my cable TV bill. I can live without cable TV. I can't live without water.

Phil Bassett
Grade IV Wastewater Operator
Grade I Collection System Operator
Moccasin Bend Wastewater Treatment Plant
Chattanooga, Tenn.

About those names

“Clean water plant” is too easily confused with drinking water plants. “Water resource recovery facility”? I agree it is too wordy, and “water” and “resource” are redundant.

I would suggest water reclamation facility or, as alternatives, water recovery facility, water renovation facility, water recuperation facility, water retrieval facility, or water rescue facility.

Greg A. Hyde
National Sales Manager
Custom Conveyor Corp.
Rogers, Minn.

It's your magazine. Tell your story.

Send your ideas for future articles to editor@tpomag.com


SCADA Solutions







PROVIDING SCADA SOLUTIONS SINCE 1981

✓ Engineering & Design	✓ Guaranteed Radio Links
✓ Plant Automation Systems	✓ 3 Year Lightning Warranty
✓ Pump Station Controllers	✓ Industry Leading Support
✓ UL508 Control Panel Shop	✓ Rental SCADA Programs

INTRODUCING...



Harmonious pump & flow management

"REDUCE PUMP ENERGY COSTS BY 30% OR MORE"

www.dataflowsys.com - info@dataflowsys.com - 321.259.5009

Visit the site daily for new, exclusive content. Read our blogs, find resources and get the most out of *TPO* magazine.



BOD TEST

The Good, the Bad and the Ugly

The BOD test made sense many years ago because of its simple, direct correlation to wastewater treatment. So why all the fuss about this standard test? It's always five days late, for starters. Read more about its history, its future and why it remains controversial. And, learn to embrace the positive with a few troubleshooting tips.

www.tpomag.com/featured

WASTEWATER RUNOFF

Ohio 5K Weaves Through Plant

It's not every day you see racers jogging through your wastewater treatment plant. But that's exactly what happened at an Ohio WWTP, which hosted a unique 5K event. Learn how race organizers hoped to promote employee health, benefit some local charities and teach the public about wastewater infrastructure.

www.tpomag.com/featured



COURTESY OF NORTHEAST OHIO REGIONAL SEWER DISTRICT

OVERHEARD ONLINE

“A collection of well-written, comprehensive SOPs is an invaluable asset. Knowing what to expect and how to react — in order and in detail — helps ensure a steady-state operation.”

9 Tips for Creating Effective SOPs

www.tpomag.com/featured

FRACKING DILEMMA

Where Will the Wastewater Go?

The discussion about fracking wastewater is far from over. As the City of Auburn, N.Y., learned, municipal plants are just beginning to understand how drilling wastewater affects a treatment system. Learn more about what a headworks study in Auburn revealed, and find out how legislature in several states might change the future of fracking wastewater.

www.tpomag.com/featured



Join the Discussion

www.facebook.com/TPOmag

www.twitter.com/TPOmag



Emails & Alerts

Visit www.TPOmag.com and sign up for newsletters and alerts. You'll get exclusive content delivered right to your inbox, and you'll stay in the loop on topics important to you.



Composite valve. Perfected.

Scan this QR Code*
to view the new video
and learn more about the
212 Series Composite Valve.

* Requires QR Code reader



ASCO Series 212 composite valves for water purification and conditioning.

For reverse osmosis applications from drinking water to restaurant equipment to grocery store produce misting, here's the valve you've been waiting for! Available in 3/8" to 1" pipe sizes, it's the first to combine reliable, lead-free construction — proven up to 1 million cycles — with the highest available temperature and pressure ratings, plus testing and certification by NSF International. It also provides the industry's fastest, most cost-effective assembly via our unique new FasN™ universal valve connection system. Get tomorrow's perfected composite technology by calling ASCO today!

ASCO
Right. Now.™


EMERSON
Industrial Automation

The ASCO trademark is registered in the U.S. and other countries. FasN is a trademark of ASCO Valve, Inc. The Emerson logo is a trademark and service mark of Emerson Electric Co. © 2014 ASCO Valve, Inc.

800-972-ASCO (2726) | www.ascovalve.com/composite | e-mail: info-valve@asco.com



The staff members at the Cohasset plant have begun extensive updates on the hardware and infrastructure, including installing warning lights and alarms for key equipment.

Upgrades on the Fly

OPERATORS AT THE TREATMENT PLANT IN COHASSET, MASS., HAVE BECOME ADEPT AT TROUBLESHOOTING AND FIXING ISSUES QUICKLY AND EFFECTIVELY

STORY: **Scottie Dayton**
PHOTOGRAPHY: **Ed Collier**

THE ATYPICAL DESIGN OF THE COHASSET (MASS.)

Wastewater Treatment Plant confuses visiting operators and challenges those who run it. Mark Cataldo, project plant manager with United Water, inherited the 46-year-old facility in January 2011.

Although the treatment process had been upgraded to tertiary membrane bioreactors in 2001, many necessary improvements confronted him. Tim Swimm, operations and maintenance technician, joined Cataldo in July 2012. Together, they often worked with very little while significantly revitalizing the plant.

David Burns, environmental engineer with the state Department of Environmental Protection, recognized their efforts and was instrumental in the plant receiving the 2013 Best Small Wastewater Treatment Facility award from the Massachusetts Water Pollution Control Association.

“We don’t fool around,” says Cataldo, a Grade 7 wastewater operator with 26 years of experience. “We get to the root of problems and fix them. Tim and I have become adept at doing things quicker and better.”

TERTIARY PROCESS

The plant may be small (450,000 gpd design flow), but its process is sophisticated and its effluent quality is high. Wastewater enters the pump building through a Channel Monster grinder (JWC Environmental) before spilling into a wet well with two pumps (Aurora/Pentair) that send it 300 feet to the rear of the plant.

Cohasset (Mass.) Wastewater Treatment Plant

BUILT: | 1968 (upgraded 2001)

POPULATION SERVED: | 4,500

SERVICE AREA: | 31.5 square miles

FLOW: | 450,000 gpd design, 225,000 gpd average

TREATMENT LEVEL: | Tertiary

TREATMENT PROCESS: | Membrane filtration

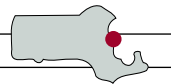
RECEIVING STREAM: | Cohasset Inner Harbor

BIOSOLIDS: | Hauled to another plant

ANNUAL BUDGET: | \$600,000 (operations)

WEBSITE | www.cohassetmass.org/sewer

GPS COORDINATES: | Latitude: 42°14'24.94" N; longitude: 70°47'55.16" W



After passing through a SpiraGrit vortex grit removal system and Hydronic T screening system (both from Lakeside Equipment Corp.), the water flows to an anoxic selector with a mixer (Flygt – a Xylem Brand), then enters one of two parallel treatment trains. Each ZeeWeed ultrafiltration system (GE Water & Process Technologies) has seven immersed cassettes holding hollow-fiber membranes with 0.1-micron pores.

Valves control the treatment cycle. Upon activation, the first valve opens, enabling the permeate pump to backflush the membranes. That valve closes



Tim Swimm, operations and maintenance technician, greases the blower motors as part of routine maintenance.



Mark Cataldo, left, project plant manager, and Tim Swimm, operations and maintenance technician, monitor operations at the plant.



Cataldo and Swimm often worked with limited resources while significantly revitalizing the plant.

IN THE FIELD

When Mark Cataldo, project plant manager, and Tim Swimm, operations and maintenance technician, are not at the Cohasset (Mass.) Wastewater Treatment Plant or responding to customer service calls, they maintain the collection system.

Quarterly, the team members exercise the valves on 44 air-release manholes and pump out stormwater using a submersible pump (Godwin) and generator on the back of a pickup truck. They inspect the 62 watertight manholes annually.

During extended power outages, the operators join subcontractors, putting generators on the backs of their trucks and providing temporary power to 900 grinder pumps. “Some power boxes are 150 feet from where we park, and our cables are 25 feet long,” says Cataldo. “We run the pump for three or four minutes to lower the level in the 75-gallon tank, then undo everything and go to the next customer.” Crews average six houses an hour.

A January 2012 blizzard knocked out power for five days. Three crews worked 12-hour shifts in 2 feet of snow. One crew used every cable available to reach a home’s built-in generator plug. “They barely made the connection by going through the living room, kitchen and out the back door while holding the cable plugs together over their heads,” says Cataldo. The plant generator ran continuously for 48 hours.

and another opens to draw liquid through the fibers to fill the backpulse tank. After it closes, a third valve opens, sending permeate from the tank through the UV disinfection system (TrojanUV), and then to a chamber with three alternating submersible pumps (Goulds) that discharge to dedicated duckbill diffusers in the Cohasset Inner Harbor.

The plant averages 225,000 gpd from 4,500 customers. It treats 5,000- to 6,000-gallon batches every 15 minutes (the time it takes to fill an aeration tank) during peak flows, and every 60 minutes during low flows. About 30 percent of customers tie into 12 miles of 8-inch gravity sewer. The rest of the collection system has 22 miles of 2-inch low-pressure sewer with grinder pumps, eight lift stations, 62 watertight manholes and 44 air-release manholes.

CALL THE EXPERTS

Cataldo and Swimm have become adept at diagnosing issues in the treat-

ment process and either devising economical solutions or getting appropriate help. As they learned more about the plant, they wondered why the pumps for the treatment trains’ manifold air-vacuum system — which keeps permeate in the piping and air out — were shutting off sporadically. Because the SCADA system could not activate the second pump, “One of us had to drive to the plant and hit the on button,” says Cataldo.

Of more concern was why the pumps, rated to last five years, were burning out in seven months. The \$5,000 replacements were eroding the annual \$600,000 operations budget. “If we can’t solve a problem, we ask engineers and manufacturers to evaluate it,” says Cataldo.

Cataldo called the pump manufacturer, SIHI Pumps Americas, and sent a photograph of the piping. It showed the discharge line rising above the pump, then traveling horizontally to the aeration tank and down to it. The representative called immediately to ask the height of the discharge

Cohasset Wastewater Treatment Plant PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT
BOD	220 mg/L	<2.0 mg/L	20 mg/L monthly avg.
TSS	300 mg/L	<1.5 mg/L	20 mg/L monthly avg.
Ammonia	3.9 mg/L	<0.04 mg/L	Report weekly

pipe, which the operators reported as 32 inches. “He said it should be no more than 12 inches above the pump,” says Cataldo.

The additional height allowed permeate to drop back into the pump when it shut off, causing the 3,500 rpm impeller to reverse, slam and loosen. Cataldo and Swimm cut out the piping on both pumps, mounted hose barb connections on the discharge pipes, and ran hoses to the floor drain that feed back to the headworks. The pumps have run smoothly since then.

TOUGH SURPRISES

In one case, the air-vacuum system caused a sanitary sewer overflow on a Sunday afternoon in 2012 when it shut down the plant for 24 hours. Responding to the alarm, Swimm started the second pump, while Cataldo shut off the influent pumps and let the wastewater fill up the sewer main. A contractor cleaned up the 5,000 gallons of wastewater that escaped.

The following morning, an electrician put a megohmmeter on the pump wires and found a short. When he pulled out the wiring, the casing was missing in some areas. Replacement wiring fixed the problem. “The damage happened during the plant upgrade,” says Cataldo. “We also inspected a 3-inch cast-iron drainline to the headworks and found it

“We don’t fool around. We get to the root of problems and fix them. Tim and I have become adept at doing things quicker and better.”

MARK CATALDO

clogged with debris and small hand tools.” They jetted and cleaned the pipe to restore its capacity.

Another puzzle was why the pneumatic actuators on the treatment trains broke every seven months. “We were told the supplies on hand were new, but they failed, too,” says Cataldo. “A closer look revealed that parts were used.” Replacements at \$800 apiece broke just as fast. Cataldo eventually ran out of actuators for one train and had to shut it down for a day.

“I asked the town, which has always been cooperative, for \$25,000 to buy replacements for every component in a train,” says Cataldo. “That’s eight valves, eight actuators, eight solenoids and 20 pressure snubber valves.” The operators also filled a toolbox with everything needed to repair or replace valves and actuators. The idea reduced a two-hour task to 30 minutes.

HARSH ENVIRONMENT

The reason for the actuator failures remained a mystery until Cataldo brought in Energy Machinery, a compressed air specialist. The technician discovered that the filters on the air dryer had never been changed and were clogged, and that the air line to the air compressors had no oil/water separator. Without them, the actuators gummed up and broke.

“For \$2,000, we piped in a separator and two air dryers,” says Cataldo. “We also added filter changes to our maintenance schedule.” At his request, the Energy Machinery technician installed a connection for running the system with a trailer-mounted compressor during emergencies.

As for the membranes, the maintenance schedule calls for cleaning every six months. First, the operators hoist out a cassette, hose it down, and remove rags and debris trapped between the vertical fibers — that takes two to 2 1/2 hours. Then they transfer the cassette to the 5,000-gallon dip tank at the rear of the building.

(continued)

When you want the ultimate in pump control, get the Ultimate Pump Controller

- Touch screen HMI
- Flow Pulse pipe flow sensor gives true pump efficiency for Compliance Reports
- Dedicated web server
- Real time communications - DNP3, TCP/IP, Modbus and Profibus
- Pump reversing - patented 'Retroflo' pump monitor gives auto reverse choices
- Burst/Block - prediction of level/flow rates
- Time to Spill indication
- Infra-red camera for live view of your asset

The brand new Ultimate from Pulsar.
Contact us today for information.
Innovation. It's in our DNA.



New





Tel: +1 850 279 4882
info.usa@pulsar-pm.com

www.pulsar-pm.com

“I’m amazed at the hours the operators put in. They’re working on grinder pumps on weekends, holidays and nights.”

DIANE HINDLEY

Mark Cataldo takes notes on a newly installed flowmeter (Sparling).



“Our instructions were to add 15 gallons of sodium hypochlorite to 1,000 gallons of water and aerate the solution,” says Cataldo. “In June 2013, a GE representative said the correct procedure was to maintain 1,000 parts per million of hypochlorite for 12 hours, then leave the cassette in the solution overnight.” Because there was no ventilation system, aeration of the heavy-dose solution set off chlorine alarms in the plant. The town and United Water are discussing covering the dip tank and installing a scrubber to remove the chlorine from the air.

The cassettes also need an annual citric acid cleaning after the hypochlorite cleaning. “We hypo-clean one train, put it back online, and clean the other train,” says Cataldo. “Then we pull and hose off the first cassettes before submerging them in an aerated citric acid solution [pH 2.4] in the dip tank for 24 hours.”

GRINDING AWAY

At the customer level, Cataldo and Swimm inherited maintenance of 400 grinder pumps. “They’re old and clog more readily when homeowners flush disposable wipes and other forbidden objects,” says Cataldo. As the original centrifugal pumps fail, they replace them with new semi-positive

displacement E/One pumps (Environment One Corp.) maintained by distributor F.R. Mahony & Associates.

“I’m amazed at the hours the operators put in,” says Cohasset Sewer Commission administrator Diane Hindley. “They’re working on grinder pumps on weekends, holidays and nights.” Their efforts have produced positive compliments from residents and a substantial drop in service calls.

Cataldo observes, “What we do at the plant and in the field is called time, energy and money. We’re thorough in our approach and concerned about what we do. As a result, our neighbors greet us warmly. Such a response tells us we’re doing our job. I couldn’t ask for a better partner than Tim. He is a self-starter — ambitious, reliable and mechanically gifted. We work well together and both of us enjoy troubleshooting.” **tpo**



Tim Swimm, left, and Mark Cataldo with their Award of Excellence from the Massachusetts Water Pollution Control Association.

featured products from:

Environment One Corporation
518/579-3033
www.eone.com

Flygt – a Xylem Brand
855/995-4261
www.flygtus.com

GE Water & Process Technologies
866/439-2837
www.gewater.com

Godwin, a Xylem brand
800/247-8674
www.godwinpumps.com

Goulds Water Technology – a xylem brand
866/325-4210
www.goulds.com

JWC Environmental
800/331-2277
www.jwce.com

Lakeside Equipment Corporation
630/837-5640
www.lakeside-equipment.com

Pentair – Aurora Pump
630/859-7000
www.aurorapump.com

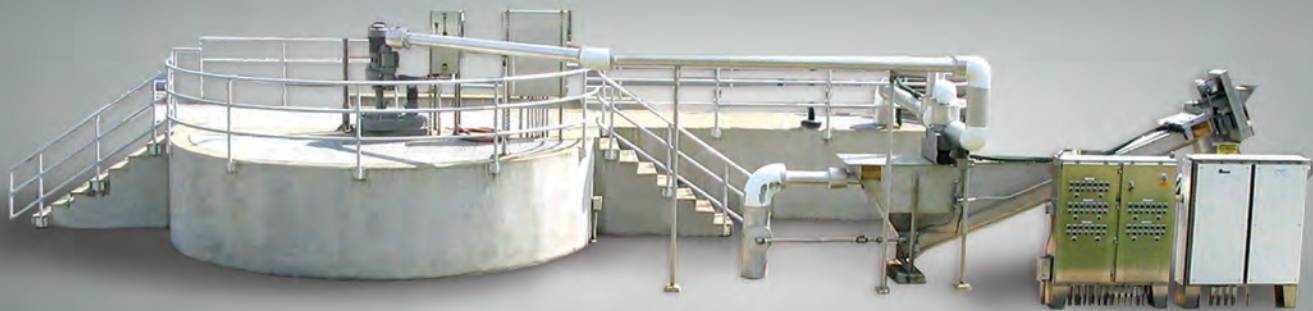
SIHI Pumps Americas
716/773-6450
www.sihi-pumps.com

Sparling Instruments, LLC
800/800-3569
www.sparlinginstruments.com

TrojanUV
888/220-6118
www.trojanuv.com

95% GRIT REMOVAL FOR THE LOWEST COST.

- ✓ BEST INVESTMENT FOR 95% GRIT REMOVAL DOWN TO 105 MICRONS
- ✓ LOWEST INSTALLATION & CONSTRUCTION COSTS
- ✓ LOWEST UTILITY / ENERGY / OPERATIONAL COSTS



PISTA 360
WITH V-FORCE BAFFLE™



Industry-leading S&L hydraulic vortex technology inside every PISTA® 360™ Grit Removal System delivers more than just 95% removal of troubling grit. When you compare our dramatic installation cost and operational utility savings, you'll see superior return on investment. It's performance you expect with the real benefits of having the lowest lifetime system costs. Grit removal isn't pretty, but the more you look closely at the PISTA®, the better it looks. Get the facts on PISTA® and head-to-head grit system comparisons at SmithandLoveless.com



Smith & Loveless Inc.
Above All Others.™

BY THE WORLD LEADER IN GRIT REMOVAL .

{ Call 800.922.9048 } { VISIT SmithandLoveless.com }

Winning With Winnie

SCOTTISH WATER OPENS EYES, AND SEWER PIPES, WITH A MULTIMEDIA CAMPAIGN THAT TELLS CONSUMERS WHAT NOT TO FLUSH AND THE TROUBLE IMPROPER DISPOSAL CAN CAUSE

By Craig Mandli

You might have seen the photo by now: a large Winnie the Pooh plush toy blocking a sewer drain in East Kilbride, Scotland.

The photo from Scottish Water, which made the viral media and Internet rounds in February, was ripe for playful headlines and jokes from late-night comedians. And the publicity was just what Scottish Water wanted.

The photo was one of a series showing the oddest items found in the agency's sewer network — like a child's bike, a goldfish, a snake, a pair of jeans, false teeth and even a live badger. Scottish Water released the photos as part of a campaign to educate consumers on the need to keep the wastewater system running efficiently.

Scottish Water, which provides water and wastewater services to some 2.4 million households in Scotland, says it dealt with 40,000 blockages to its drains and sewer network in 2013, an estimated 80 percent caused by large objects; cooking fat, grease and oil; cotton balls; and “flushable” wipes. According to William Ancell, senior press officer, the irresponsible disposal of items costs the utility more than 7 million pounds (\$5 million U.S.) each year.

“We believe that the majority of these are avoidable and the result of inappropriate items being flushed down the toilet and down sinks,” says Ancell. “The cost of advertising to our customers we believe will create efficiencies in the long term and be worth the investment.”

LISTENING TO CUSTOMERS

Ancell says the campaign is a direct response to customers saying it's a high priority to reduce sewer overflows inside homes and in the streets. Blockages are often an issue at the utility's wastewater treatment facilities, as well.

“Incidents of flooding are directly linked to chokes [blockages] in Scottish Water's sewer network,” says Ancell. “When a choke occurs, the wastewater flow from properties and drains backs up to the easiest point of discharge.”

Utility officials discussed how to tackle the problem and determined that advertising and education were the best approaches. They first used cartoons as a modern, light-hearted way to get people thinking more about



ABOVE: A stuffed Winnie the Pooh backed up a sewer drain in East Kilbride. RIGHT: A Scottish Water educational brochure.



the impact of their actions. “We put the ‘Water Cycle’ at the heart of the adverts, as this translated well to our customers’ understanding of what we do as a business,” says Ancell.

The utility determined that a multi-channel approach would get the best impact. The campaign combines TV, radio, outdoor and online advertising, along with local media publicity and community outreach.

“We’ve had a great response from the public, elected members of the government and local councils, and other key stakeholders, such as the Scottish Environment Protection Agency,” says Ancell. “We are always look-

“We believe that to change customer behavior, we need regular communication through these kinds of campaigns.”

WILLIAM ANCELL

ing at how we can get the best value out of our campaigns, and are now attempting social media advertising in the form of promoted tweets and geographically targeted Facebook advertisements. We also encourage employees to use their social media presence to further the messages on LinkedIn, Twitter and Facebook.”

POOH ON THE WORLD STAGE

One thing the utility didn't expect was the viral response to its photo release. Sensing the opportunity to capitalize, the press team went into overdrive to make sure a unified message went out to all requesting information.

“It has been a pleasant surprise, and a great opportunity that we made the most of,” says Ancell. “After the story went viral, there were a few days where the press office was just inundated with calls, interview requests, photo requests and journalists generally wanting fresh copy so they could

put their own spin on it.” Ancell coordinated the responses and made sure to maximize each coverage opportunity.

Besides warning homeowners about disposing of items properly, Scottish Water’s campaign highlights simple water-saving tips, such as turning off taps while brushing teeth. “School visits and education have been featured in the past and continue to be a focus for us,” says Ancell. “We have also visited universities, parent/baby groups, and midwives to spread the message. We have a dedicated effluent team whose members meet with businesses across the country on best practices for wastewater treatment and disposal.”

The utility encourages its operations staff members to speak to customers when they are out clearing blockages. Information is sent by mail to homes in repeat problem areas. The utility’s employee volunteer program also gives staff members two days a year to volunteer in their communities.

“Some have used it to go out to community groups and schools to promote our campaign messages with a presentation on what not to flush or put down the sink,” says Ancell. “This work will continue to support the campaign year-round.”

The utility also has a long-running “Bag It & Bin It” campaign listing items to place in the trash instead of flushing. The website www.scottishwater.co.uk/cycle serves as an information and education resource.

“We believe that to change customer behavior, we need regular communication through these kinds of campaigns,” says Ancell. “We are reviewing how we sustain the communication of the messages year-round.” **tpo**



ABOVE: A live goldfish found in a Scottish Water wastewater treatment line. BELOW: A bicycle and a fax machine blocked a sewer drain in East Kilbride.



7 YEARS SPECIAL FINANCING

ZERO DOWN
NO INTEREST
NO PAYMENTS

For one year on
Fabric Structures



CUSTOM WATER SYSTEMS APPLICATIONS


- Customized for treatment plants, sludge beds and more.
- Lower energy costs with natural lighting.
- Stay warmer in the winter...and cooler in the summer.
- One-stop shop offering all services in house.
- Buildings up to 300' wide.
- Low in cost per square foot.
- Easy to expand and relocate.



MADE IN USA

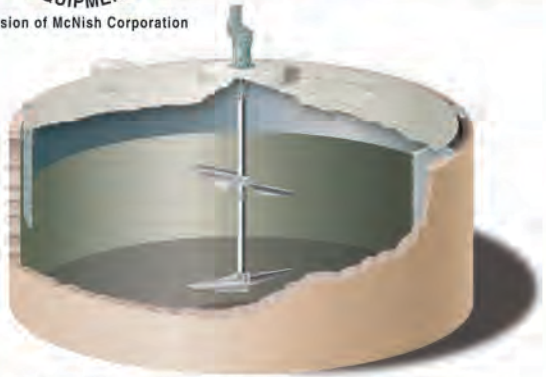


Call 1.866.643.1010 and use code ADTPO or visit www.ClearSpan.com/ADTPO and we'll send you a free gift.




Division of McNish Corporation

Lowest Installed Energy For the Right Digester Mixing



- Complete mixing, without gas entrainment and foaming.
- Retrofit to existing fixed or floating covers, with minimal on-going maintenance.
- Each agitator custom designed for the application.
- Complete system with controls.

Walker Process Equipment
www.walker-process.com



CHANCE OF A LIFETIME

KEN REYNOLDS WELCOMED A CHALLENGE AND LED HIS TEAM THROUGH A TRANSITION FROM AN AGING CONVENTIONAL PLANT TO A SOPHISTICATED MEMBRANE FACILITY

STORY: **Ted J. Rulseh**

PHOTOGRAPHY: **Patrick Murphy-Racey**

ON ONE HAND IT WASN'T EASY switching from an old, familiar conventional water treatment plant to brand-new technology. On the other hand, it was an opportunity that comes along perhaps once in a generation — an opportunity many operators never get.

So Ken Reynolds embraced the challenge with his team in the city of Alcoa, Tenn. He guided an energetic and relatively young staff in assuming control of a fully automated, SCADA-driven membrane filtration facility just across the street from the old plant. At the time it went online in 2007, it was the largest immersed membrane water plant east of the Mississippi River.

Equipped with ZeeWeed 500 hollow-fiber membrane systems (GE Water & Process Technologies), the plant has a 16 mgd design capacity and an average flow of 6 to 7 mgd. It consistently achieves 0.015 NTU turbidity from variable-quality water in the Little River, which flows out of the Great Smoky Mountains.

Reynolds, water treatment plant supervisor since 1997, worked with the city's engineering consultants in reviewing options to replace the old facility, built in the 1920s and aging severely. He credits his team for a mostly smooth transition: "Our people were not intimidated by the technology. There was nobody old and set in their ways. They were all really open-minded and willing to learn the system."

HOMETOWN TIES

Reynolds, winner of a 2013 Operator Meritorious Service Award from the Kentucky/Tennessee Section AWWA, was born in Greenville, Tenn.,



Ken Reynolds, water treatment plant supervisor for the City of Alcoa, Tenn.

but has lived in Alcoa since age 6. He earned a bachelor's degree in biology in 1983 from Tennessee Technological University.

He went to work for the City of Alcoa about nine months after college as a meter reader, but with his eye on a career related to his schooling. It took 12 years before he landed an assistant operator position at the water plant. A year later he had his Grade IV (highest) water treatment license and moved into an operator's role; another year later the plant supervisor retired and Reynolds replaced him.

He leads eight operators, all with Grade IV water treatment licenses, and four maintenance staff members who work out of the water plant but perform general maintenance for the city. The team members are:

- Senior operator: Paul Phillips (33 years with the plant)
- Lab manager/operator: Dorothy Rader (15)
- Operators: Phil Bull (35), T.J. Emory (10), Steve Harris (15), Lori Sweppenheiser (nine), Russell Whitehead (eight) and Mike McClurg (nine)
- Certified maintenance: Mike Jenkins, plumber (18); Dave Shannon (22) and James McCarter (15), electricians

In addition, seven team members service the water distribution and wastewater collection systems, all holding at minimum Grade II distribution or collection licenses:

- Construction services supervisor: Mark Ross (27)
- Leadworker II: Randy Slagle (25), Danny Ogle (22) and Gary Neeley Jr. (11)
- Utility serviceworker II: Josh Rutledge (11)
- Utility serviceworker II: Kevin Ray (22)
- Equipment Operator II: Paul Monroe (15)



PHOTOGRAPHY BY AERIALINNOVATIONS OF TENNESSEE

The Alcoa water plant, with its hollow-fiber membrane filtration technology, serves a city of about 24,000 residents.

Ken Reynolds, City of Alcoa, Tenn.



POSITION: | **Water treatment plant supervisor**
 INDUSTRY EXPERIENCE: | **18 years (all with City of Alcoa)**
 EDUCATION: | **Bachelor's degree, biology,
Tennessee Technological University**
 CERTIFICATIONS: | **Grade IV water treatment,
Grade II water distribution**
 AWARDS: | **2013 Operator Meritorious Service Award,
Kentucky/Tennessee Section AWWA**
 GOALS: | **Maintain new water plant's level of
performance and water quality**
 WEBSITE: | **www.cityofalcoa-tn.gov**
 GPS COORDINATES: | **Latitude: 35°47'24.05" N;
Longitude: 83°58'02.07" W**



“Our people were not intimidated by the technology. There was nobody old and set in their ways. They were all really open-minded and willing to learn the system.”

KEN REYNOLDS

Ken Reynolds is quick to give credit to his staff members, who receive ongoing training. Work days often begin with team meetings.



The staff at the water treatment plant in Alcoa (shown in the pumphouse) includes, from left, Dave Shannon, Ken Reynolds, Kenny Blair, Dorothy Rader, James McCarter, Paul Phillips, Phillip Bull, Mike Jenkins and Russell Whitehead.

IT STARTED WITH ALUMINUM

Yes, the city of Alcoa has ties to a world-leading aluminum company. In fact, Alcoa (originally called the Aluminum Company of America) came first to the foothills of Great Smoky Mountains National Park in Tennessee.

“The aluminum company came here because of all the water,” says Ken Reynolds, water treatment plant supervisor for the city. “They built dams for their electrical needs, and they used to have three aluminum plants and a smelter here. All they do here now is recycle aluminum and roll can stock.”

What became the city’s first water treatment plant was built by the Alcoa company in 1927. The City of Alcoa took over its operation in 1960, replaced it in 1963, and expanded it in 1973 and 1978 to an ultimate design capacity of 24 mgd. The city replaced that conventional plant with a membrane facility in 2007.

The aluminum company still accounts for about 30 percent of the new membrane treatment plant’s average flow of 6 to 7 mgd. “We used to sell them about 8 mgd, but now they’re down to about 2 mgd,” says Reynolds. “They use a lot of water for cooling, and they learned that they could recycle it.”

SCENIC SETTING

Alcoa (population 8,500) lies about 10 miles south of Knoxville in the foothills of Great Smoky Mountains National Park. The city’s water system serves about 24,000 people, including the Tuckaleechee Utility District and surrounding areas of Blount County.

The Little River provides generally high-quality source water, although its turbidity can increase from 5 NTU during dry weather to 100 to 200 NTU during rainfalls, as feeder streams and creeks pour in sediment.

While the old plant had treated that water reliably for years, the need for change became apparent early in Reynolds’ tenure as supervisor. “We had four old upflow clarifiers, two built in 1961 and 1963 and the others in 1972 and 1978,” Reynolds says. “We went through rehabilitation on the two newer ones, and from exposure to the water and chemicals, the metal in them was just about shot.

“We looked at what we could do by way of an upgrade, and it appeared that was going to be a nightmare, just throwing good money after bad. We had land available across the street, and we decided to build a new plant there. At the time, membrane technology was relatively new and somewhat expensive, but the price was coming down. By 2002, the cost was pretty comparable to building a new conventional plant.” So, with an eye toward getting ahead of new U.S. EPA rules and regulations on turbidity and disinfection byproducts, the city decided on membranes.

SIMPLE PROCESS

The city council and utility commission supported the decision because Reynolds, his staff and engineering consultants Smith Seckman Reid did their homework, presenting all options with the pros, cons and costs. Architects International designed and general contractor W. Rogers Group built the \$28 million facility.

“We have an awfully good staff here. The operating staff and the maintenance team get along very well. In the end, it’s not about me — it’s about everybody else here.”

KEN REYNOLDS

The switch to membrane technology eliminated the settling step from the treatment process. The raw water needs minimal treatment for pH or alkalinity. After coagulation using aluminum chlorohydrate (ACH), it goes straight to the hollow-fiber filters with nominal 0.04-micron pore size, forming a positive barrier to solids and pathogens. All told, there are 1,344 filter modules in six tanks with some 3.9 million fibers totaling 27.9 million feet.

After filtration, the water is disinfected using sodium hypochlorite generated on site using a ClorTec system (Severn Trent Services), fluoridated and sent to a clearwell. It is then pumped to storage facilities that include two 6-million-gallon reservoirs, three standpipes totaling 1.45 million gallons, and a 1.5-million-gallon elevated tank. Some 245 miles of distribution and transmission mains deliver water to customers.

BIG ADJUSTMENT

While the treatment process itself is simple, adjusting from old technology tested Reynolds’ leadership skills and his team’s adaptability. “It was almost night and day, going from old plant to the new plant,” says Reynolds. “We went from chlorine disinfection to onsite hypochlorite generation, from conventional treatment to membranes, from mechanical control to a SCADA system and telemetry. Our learning curve was pretty much straight up.

“We received good training from the membrane vendor, but a lot of the training was on the job, after the fact. It’s very different to read about it than to actually put your hands on it and then work the bugs out of all the equipment, computers, controls.”

One early challenge the team took on was replacing alum coagulant with ACH. “We started with alum and acid with enhanced coagulation, and it worked fine in summer, but not so great in winter,” Reynolds recalls.

“Alum doesn’t work well in cold, clear water. And soon after we started, the price of sulfuric acid went sky high. One month our chemical bill was close to \$30,000. In addition, because we dropped the pH to get the alum to work, we had to feed that much more caustic on the back side to raise it back up. We went to ACH about five years ago, and it cured a lot of the problem. Our chemical bill is now about \$6,000 a month.”

Working with the SCADA integrators (MR Systems) was also challenging. Never having worked with SCADA before, staff members had trouble telling the integrators what they wanted the system to do. “We had to depend on them to guide us and hold our hand somewhat,” says Reynolds. “After we gained experience with it, we were better able to tell them we wanted it to do this or that.”

PLEASED WITH AUTOMATION

The SCADA system and telemetry have enhanced control over the water system, and over 18 wastewater lift stations. Telemetry monitors water reservoir and water tank levels. “With the SCADA system we’re able to set a certain level at the reservoirs,” says Reynolds. “If we set the level at a reservoir at 26

feet and demand through the day causes that level to drop, the system can signal the intake pumps to ramp up.”

The low-service and high-service pumps are equipped with variable-speed drives. Operators still set flow rates manually, continuing a practice from the old plant. “It keeps the operators a little more engaged in what’s going on,” says Reynolds. Operators also monitor stream gauges that detect source water turbidity and optimize the process by adjusting chemical doses as necessary.

So far the filters have handled source water variations with no impact on finished water quality, Reynolds reports. In fact, the water quality was good

Attention Treatment Plant Operators

Let us pump your sludge. Then you be the judge.

Put our pump to the test. There’s no cost to you. Take the PVP Challenge and prove it to yourself.



We are so confident in our pumps’ ability to reduce your overall maintenance and labor costs that we will let you take one for a test drive... for FREE. You provide the application and we’ll provide the unit. It’s that simple! PVP Double Disc®, Positive Displacement pumps feature:

- Seal-less, gland-less, oil-less design for zero routine maintenance.
- Will run dry indefinitely without damaging the pump.
- Passes solids up to 2 inches in diameter and full-line semi-solids.
- Fewer moving parts means less need for repairs or maintenance.
- Patented Maintain-in-Place design reduces downtime and lowers maintenance costs.



Step 1-Suction Cycle.



Step 2-Discharge Cycle.



Toll Free: 800-311-3311
PennValleyPump.com



Water Environment Federation
Innovative Technology Award
2008
Solids Handling/Disposal

The PVP Difference

The repair of progressive cavity or rotary lobe-style pumps can be complex and costly. Our Double Disc® Pump system will operate up to 10 times longer in the same application and cost up to 70% less to repair when the need occurs.

Swap Your Pump

Install one of our pumps and put it to the test. There’s no cost to you. PVP Double Disc®, Positive Displacement Pumps are designed to handle the toughest sludge challenges.





DEWATERING

Dewatering Unit • Polymer Injection System
Sludge Pump • Hoses • Working Platform • Hydraulic Trailer

*We do one thing to perfection —
Dewater Liquid Waste!*

- » Pass the paint filter test in 24 hours
- » No waiting, Equipment is in stock
- » Visitors welcome at our dewatering facilities

Don't settle for less ... demand the best - ADS



AQUA-Zyme Disposal Systems

Call us at (979) 245-5656
zymme@aqua-zyme.com
www.aqua-zyme.com

FINANCING
AVAILABLE



BioTriad Environmental, Inc.

A Trusted Manufacturer and Service Provider for:

- Carbon Air Filters & Dry Air Scrubbers
- Dewatering Containers & Grit Hoppers
- Flocculants & Polymer Makedown Systems
- Water & Vapor Phase Odor Neutralization
- Specialty Wastewater Treatment Chemistry

T: (888) 658-7423 www.BioTriad.com F: (570) 300-2323

Socially Accepted



facebook.com/TPOmag

twitter.com/TPOmag

plus.google.com

youtube.com/TPOmagazine

linkedin.com/company/treatment-plant-operator-magazine

“We went from chlorine disinfection to onsite hypochlorite generation, from conventional treatment to membranes, from mechanical control to a SCADA system and telemetry. Our learning curve was pretty much straight up.”

KEN REYNOLDS

enough to win a 2013 Best Tasting Tap Water award from Kentucky/Tennessee AWWA and qualify to compete at the AWWA national conference in Boston in June 2014.

Operators stay abreast of developments in the water industry by completing continuing education requirements for their Grade IV licenses. Reynolds also encourages them to obtain distribution licenses. City officials support continuing education by sharing the cost and allowing team members time off for training.

“We try to attend as many local classes as we can that are no cost,” says Reynolds. “The State of Tennessee, like everybody else, is cutting back on free training. Most training sessions now cost about \$125 to \$150 a day, and with nine people, some of whom have multiple licenses, that could get pretty expensive.

“We attend meetings of the Tennessee Association of Utility Districts, which offer a couple of hours of education credit. We rotate who goes to the Kentucky-Tennessee AWWA annual meeting.”



Alcoa residents enjoy award-winning water.

CHALLENGES AHEAD

Support from city officials, including competitive salaries and benefits, has helped keep an experienced Alcoa plant team intact. Operators are proud to show the new facility off to tour groups ranging from University of Tennessee engineering students to local elementary school classes.

While the plant has run smoothly for seven years, Reynolds notes that the time has come to start planning for membrane replacement and renewal of ancillary equipment. He faces the future with confidence: “We have an awfully good staff here. The operating staff and the maintenance team get along very well. In the end, it’s not about me — it’s about everybody else here. They keep the plant running. I’m just a spoke on the wheel.” **tpo**

featured products from:

GE Water & Process Technologies

866/439-2837
www.gewater.com

MR Systems

678/325-2800
www.mrsystems.com

Severn Trent Services

866/646-9201
www.severntrentservices.com



inspiring, stimulating, motivating

Savored by wastewater and water treatment professionals.

Get your fill for free. Subscribe at www.tpomag.com



GRpumps.com



PUMPS FOR SEWAGE & WASTEWATER



COLLECTION SYSTEMS ■ DIGESTER RECIRCULATION ■ EFFLUENT ■ FLOOD CONTROL ■ FILTER FEED ■ WAS ■ RAS ■ SLUDGE TRANSFER

Gorman-Rupp manufactures a complete line of above- and below-ground lift stations designed specifically for sewage. Our lift stations can be used in new wastewater collection systems for community expansion or to retrofit an existing pump system.

We set the industry standard in solids-handling, emergency back-up and bypass engine-driven pumps for all your wastewater needs. Every Gorman-Rupp pump is factory-designed and tested for long lasting, trouble free use. All Gorman-Rupp pumps are backed by the best distributor network and parts inventory in the industry. Contact your local Gorman-Rupp distributor today for more information on our line of sewage-handling products.



GORMAN-RUPP PUMPS GROUP

P.O. Box 1217 ■ Mansfield, Ohio 44901-1217 ■ USA
PH: 419.755.1011 ■ FX: 419.755.1251 ■ grsales@gormanrupp.com



Three for One

A DEMONSTRATION PROJECT AT ORANGE COUNTY SANITATION DISTRICT TESTS THE VIABILITY OF USING A FUEL CELL TO GENERATE ELECTRICITY, HYDROGEN FUEL AND HEAT

By Doug Day

Cogeneration is nothing new to the clean-water industry, but in southern California, the Orange County Sanitation District has taken it one step farther, hosting a trigeneration demonstration project: a facility that turns biogas into hydrogen, electricity and heat.

With the cooperation of the National Fuel Cell Research Center at the University of California Irvine, the \$8 million research project at the 103 mgd Fountain Valley Wastewater Treatment Plant began in September 2010, testing the use of a fuel cell to tap the energy potential of biogas.

The National Fuel Cell Research Center collaborated with technology developers Air Products and FuelCell Energy to design a fuel cell demonstration project. Then they contacted the Orange County district about hosting it. The project is funded by grants from the California Air Resources Board, the U.S. Department of Energy, the South Coast Air Quality Management District, and Southern California Gas Company.

Key to the system is a 300 kW fuel cell that performs the direct fuel-to-energy conversion through an electrochemical process instead of combustion. The project is the first in the world to use digester gas for a fuel cell, which generates the hydrogen for automotive fuel, electricity for the clean-water plant, and heat that could be used for purposes such as heating the anaerobic digesters that produce the biogas.

“As a fleet manager, we’ll have to look at the availability of fuel in the future and at cost-effectiveness. Whether we keep the demonstration project and actually lease or purchase some of these vehicles is unknown at this time.”

NICK J. ARHONTES

SUPPORTING THE CAUSE

“We were interested from a couple of perspectives,” says Ed Torres, director of operations and maintenance for the Orange County Sanitation District. “We were looking at new ways to bring power into our facility because our demand was increasing and the percentage of power we generate on site was starting to diminish. The South Coast Air Basin is the most heavily regulated air district in the nation, so we were also interested in the ability to meet possible future mandates to move to alternative energy.”



The \$8 million tri-generation pilot research project is the first to use digester gas to produce electricity, hydrogen for auto fuel, and heat for anaerobic digesters. It can produce 250 kW of electricity and 100 kilograms of hydrogen per day (equivalent to about 250 gallons of gasoline).



PHOTOS COURTESY OF ORANGE COUNTY SANITATION DISTRICT

Vehicles can fill up at the Air Products hydrogen fuel station at the Orange County Sanitation District. The hydrogen storage system is in the background.

The district also wanted to support the state’s efforts to expand use of and infrastructure for hydrogen-fueled vehicles and a project called the California Hydrogen Highway. The state wants to have 100 hydrogen fueling stations by 2017; it now has 13 research stations and nine public fueling stations.

The wastewater plant’s hydrogen fueling station is one of four in Orange County and the only one that makes hydrogen for dispensing — the others receive hydrogen produced from natural gas. The Orange County station is located next to the plant’s natural gas fueling station, which has been available to the public for years.

SUBSTANTIAL PRODUCTION

“There is hydrogen generated in the fuel cell itself, and it gets pumped over to storage at the fueling station in front of our plant,” says Torres. Air Products, a provider of hydrogen fueling technology, installed the fuel station and owns and maintains it.

From its inception in September 2010 through September 30, 2013, the Orange County facility had processed 16.8 million cubic feet of digester gas to make more than 36,000 pounds of hydrogen and 2.4 million kWh of electricity.

Waste heat is not being used as part of the demonstration project. “It’s quite a distance from the fuel cell to the waste heat line we use to heat our digesters,” says Torres. “It wasn’t cost-effective for a small demonstration project. On any kind of large-scale project, it would be utilized.”

One thing the project has shown is improved treatment of the biogas for use in the fuel cell. "Others have struggled in the past in trying to clean the biogas and maintain the pretreatment system," notes Torres. "This one uses a fairly new pretreatment system from Quadrogen of Canada. It's essentially removing all of the sulfides and siloxanes."

FLEET ADDITIONS

For now, the hydrogen fuel is used by the sanitation district, which is leasing one Toyota FCHV hydrogen test car and fuel cell vehicles from four other automakers. The district's \$300 monthly vehicle lease payment includes all the fuel it consumes.

The district has not decided whether to expand its fleet of hydrogen vehicles. "We like the fuel," says Nick J. Arhontes, director of facilities support services. The hydrogen is used by a fuel cell in the vehicle to generate electricity to power an electric motor. The only tailpipe emissions are water vapor.

"As a fleet manager, we'll have to look at the availability of fuel in the future and at cost-effec-

Torres calls it a chicken-or-egg situation: There aren't many hydrogen cars on the road, but there aren't a lot of fueling stations to support them as the number grows. "Do you build the infrastructure and wait for the car manufacturers to build up to it?" Torres asks. "If you put it at a plant like ours, if you don't have the utilization by vehicles, you just produce electricity and power your plant as the demand for vehicle fuel grows. So it can be a viable investment strategy because we can utilize the hydrogen in other ways." **tpo**

What's Your Story?

TPO welcomes news about environmental improvements at your facility for the Sustainable Operations column. Send your ideas to editor@tpomag.com or call 715/277-4094.

Demonstration Project Performance Report

04/01/13 to 09/30/13

Fuel cell operation	4,157 hours
Electricity produced	854,772 kWh
Electricity for plant use	508,951 kWh
Hydrogen produced	8,171 pounds
Digester gas consumed	3.9 million cubic feet

tiveness," says Arhontes. "Whether we keep the demonstration project and actually lease or purchase some of these vehicles is unknown at this time." The project team is working on a strategy to continue the demonstration project.

The district has renewed its annual lease on the FCHV prototype passenger vehicle, which is similar to a Toyota Highlander sport utility vehicle. "We've been very happy with it, but could get into another product," says Arhontes. "I do know a lot of manufacturers are looking at launching hydrogen vehicles in about the 2015 timeframe."

In the meantime, the district will continue to use compressed natural gas as its primary alternative vehicle fuel. "This could be another area in which we end up growing our alternative-fuel fleet," says Arhontes. "We could also see hydrogen used for small vehicles in the plant where we use a lot of electric carts for carrying cargo and personnel. We'll have to wait to see what the market brings us."

IMMATURE TECHNOLOGY

The largest question is still the economics. Torres notes that fuel cell technology remains expensive at \$3,000 to \$4,000 per kilowatt installed cost versus about \$1,000 per kilowatt for a typical internal combustion engine. "So it's still not competitive, and there is still uncertainty about the life of the fuel cell stack," Torres says. Such issues are one reason for conducting demonstration projects and a reason states and the federal government are funding the research and trying to build up the hydrogen infrastructure.

Your challenge: Reducing costs while treatment demand continues to increase. Now you can lower your energy consumption for WWTP aeration and gain process efficiencies with a choice of three blower technologies: Positive Displacement Blower | Hybrid Blower | Turbo Blower
This is Performance³.

Up to 80% of the energy consumption in WWTP is used in the aeration process. With Aerzen Blowers you can realize efficiency improvements and air flow optimization to meet highly fluctuating demand. By selecting a Hybrid Blower you can manage the base load and match the demand spikes with a Turbo Blower.
This is Performance³.



AERZEN
EXPECT PERFORMANCE

Aerzen has 150 years of success manufacturing reliable, quality blower equipment.

Let the Aeration specialists at Aerzen guide you to the right technology for your WWTP application.

Call 610-380-0244 or email aerzen@aerzenusa.com to achieve Performance 3.

See Performance 3 in action at www.aerzenusa.com



A mature stand of poplars getting ready to display their brilliant yellow fall color.

PHOTOS COURTESY OF WOODBURN WASTEWATER TREATMENT PLANT

Treatment With Trees

A POPLAR PLANTATION AT AN OREGON TREATMENT PLANT SAVES ON INFRASTRUCTURE COSTS AND CREATES AN AESTHETICALLY PLEASING ENVIRONMENT ON NEIGHBORING LAND

By Jeff Smith

Trees, trees and more trees proved to be a natural solution for meeting tightened effluent ammonia limits at the City of Woodburn (Ore.) Wastewater Treatment Plant.

Poplar trees — 41,000 of them — were planted in 1999 on 84 acres next to the 3.3 mgd (design) activated sludge plant. Flow averages 2.0 mgd from May through October, and during those months the poplars provide tertiary treatment with beneficial reuse for 1.0 mgd.

“It works very well,” says Curtis Stultz, plant supervisor, who was part of a brainstorming session with city staff and consultant CH2M HILL that produced the idea. “We were just trying to find an alternative to adding tankage and other equipment to meet the stricter standards.”

“We didn’t have to put as many tanks in the ground or spend as much on chemical additions to treat the wastewater. We are letting nature take its course.”

CURTIS STULTZ

PROOF OF CONCEPT

The success of an earlier 7-acre pilot project to prove the concept led to the 84-acre commitment. Three varieties of fast-growing poplars were planted as 8-foot-tall whips or 8-inch cuttings. “The varieties were chosen so that if we got hit with a tree disease or a fungus, we wouldn’t lose the whole plantation,” says Stultz.

The trees were planted on an engineered grid designed to provide full visibility from end to end in each row. The plantation abuts the MacLaren Youth Correctional Facility, and the grid layout satisfied concerns about an escapee running through the poplar forest.

Treatment plant effluent is discharged to the Pudding River or diverted through a 12-inch pipe to three distribution manifolds at the plantation. From there, water is distributed to different sections of the plantation through 4-inch pipe. Each day, Craig Prosser, operator III, checks laboratory effluent samples before deciding which of the 10 hp and 50 hp pumps he will use to control the irrigation rate. Rotating-head sprinklers micro-spray the poplars at 0.5 gpm during summer.

REGULAR HARVESTING

The original plan was for the trees to be a money-maker. A regular harvest and replacement program was laid out, but Stultz isn’t certain it is paying off: “I just haven’t taken the time to calculate how we are doing profit-wise.”

Recently, 12,500 trees harvested from 24 acres produced 1,700 tons of wood chips, which were shipped to a Georgia-Pacific mill for use in making corrugated boxes. The harvested acreage was restored, and new plantings are scheduled for this year to complete a seven- to 12-year cycle. Liquid and cake biosolids are applied to the poplars at standard agronomic rates. Unused biosolids are applied to 1,000 acres on a nearby farm.

WEIR

WEMCO-HIDROSTAL

Prerotation Self-Cleaning Wet Well

Proven removal of

- Wipes
- Rags
- Floating solids
- Sunken solids



Clean. Simple. Economical.

www.WeirPowerIndustrial.com/Wemco | wsprfq@weirgroup.com | 1-801-359-8731



The City of Woodburn treatment plant team includes, from left, Craig Prosser, operator III; Larry Arendt, pretreatment; Nora Lillegard, laboratory technician; Jerry Tabler, maintenance technician; Curtis Stultz, plant supervisor; Jeff Hansen, chief maintenance technician; Alyssa Sullivan, clerk II; Ramon Garcia, operator I; Carol Leimbach, operator II; and Jordan Garner and Denes Josvay, utility II.

A study to expand the Woodburn treatment plant is underway between the Oregon State University and CH2M HILL. The study aims to document that present application rates are under-watering the trees and that therefore no breakthrough to groundwater is occurring. The results could allow the city to reduce the acreage required for poplars or wetland development by allowing higher loading rates.

REACHING OUT

Stultz says that while regulatory and space limitations dictate closing the tree plantation to the public, the plant team is involved in community outreach. For example, Larry Arendt, pretreatment coordinator, makes classroom presentations to fourth- and fifth-grade classes about the water cycle, watersheds, surface water pollution, water conservation and wastewater treatment. His presentation is based on the River Ranger Project, an interactive program promoted by Clean Water Services, an Oregon water

resource management utility.

Each year the plant supports the local Oregon Earth Day celebration, either through sponsorship or by staffing a booth. Plant tours are offered for local students and occasionally they have hosted dignitaries from around the world, including the agricultural minister of China. A representative from Russia was interested in using the cottony fluff produced by the poplars. "You never know who is going to call you on the phone to inquire," says Stultz.

He adds, "Ours was one of the first treatment plants to use poplars for treatment. I think what we are doing is rather good because we're able to decrease the amount of ammonia discharged into our receiving stream, while using the water for something that is good. We didn't have to put as many tanks in the ground or spend as much on chemical additions to treat the wastewater. We are letting nature take its course. At the same time, we improved the landscape and aesthetics of the plant." **tpo**

Hitting the Curveballs

AN AWARD-WINNING MASSACHUSETTS PLANT TEAM
CREATIVELY TACKLES CHALLENGES RANGING FROM UPSTREAM
INDUSTRIAL DISCHARGES TO TIGHTENING EFFLUENT NITROGEN LIMITS

STORY: **Jim Force**

PHOTOGRAPHY: **Ed Collier**

“DOING WHAT THEY NEED TO DO, WITH WHAT THEY have.” That would be an appropriate tagline for the Attleboro (Mass.) Wastewater Treatment Facility.

Superintendent Paul Kennedy and his staff have used their ingenuity to overcome a number of challenges while operating the treatment processes cost-effectively and meet tightening discharge standards.

Plant team members have creatively used excess capacity to achieve nitrification-denitrification. In addition, they’re dealing with high ammonia and copper in the influent stream and have implemented an effective industrial pretreatment program. In 2013, the facility won the Best Medium Plant Performance Award from the Massachusetts Water Pollution Control Association.

“That award was really big for us. We’ve always been a good operating plant, but there are 40 or 50 plants our size in Massachusetts. We’ve never received an award like that before. It was great.”

PAUL KENNEDY

“That award was really big for us,” says Kennedy. “We’ve always been a good operating plant, but there are 40 or 50 plants our size in Massachusetts. “We’ve never received an award like that before. It was great.”

CUTTING DOWN NITROGEN

The Attleboro plant is designed for 8.6 mgd and now handles 4.0 mgd. The plant was built in 1980 to replace an old trickling filter operation. A

\$30 million expansion in 2008 essentially upgraded all the process equipment.

Wastewater passes through the headworks, equipped with a bar screen, a pair of comminutors and an aerated grit chamber. Then it flows through a Parshall flume before two flash mixers and flocculation mixers where ferric chloride is added for phosphorus removal and

lime for pH adjustment and copper precipitation. (Lightnin mixers were supplied by Cole-Parmer and lime slakers by Merrick Industries.)

Settling occurs in three 80-foot-diameter, 12-foot-deep clarifiers (Walker Process Equipment). Primary sludge is sent to gravity thickeners, and the overflow moves on to a second-stage wet well ahead of secondary aeration.

“We have a total of ten aeration tanks, each equipped with mechanical surface aerators [Philadelphia Mixing Solutions]. Four tanks are dedicated as anoxic zones and contain two mixers each [Flygt – a Xylem Brand]. We add MicroC from Environmental Operating Solutions as a carbon source to achieve denitrification. We have spring and summer nitrogen limits.”

The remaining six basins serve as aerobic zones for nitrification. Each basin is 10 feet deep and holds 224,000 gallons. The aeration tank effluent flows to three 12-foot-deep, 100-foot-diameter secondary clarifiers. The





Chris Strohl, operator in training, displays the Attleboro plant team's can-do attitude by pulling duty in temperatures near zero.

overflow moves on to a trio of traveling bridge sand filters (Aqua-Aerobic Systems). Imported sodium hypochlorite is used for disinfection, and sodium bisulfate for dechlorination.

Waste activated sludge is blended with primary solids, thickened, dosed with lime and ferric chloride, and dewatered on a plate-and-frame filter press (Evoqua). Kennedy says the staff likes the unit's automatic cloth washing feature.

ONSITE LANDFILL

Biosolids cake at 30 to 35 percent solids drops through hoppers to trucks that transport it to a landfill on the plant site. Kennedy reports that the current landfill cells are nearly full and another cell is under construction. Being close by, the landfill has proven cost-effective for handling biosolids. "We've looked at liquid hauling, but it was double the cost of landfilling — as much as \$1 million a year."

To control odors, Attleboro operates two biofilters (Duall, a CECO

Attleboro (Mass.) Wastewater Treatment Facility



BUILT: | 1980; upgraded 2008

POPULATION SERVED: | 42,000

SERVICE AREA: | Attleboro and parts of North Attleboro

FLOWS: | 8.6 mgd design, 4.0 mgd average

TREATMENT LEVEL: | Tertiary

TREATMENT PROCESS: | Activated sludge, sand filtration

RECEIVING WATER: | Ten Mile River

BIOSOLIDS: | Dewatering, onsite landfill

ANNUAL BUDGET: | \$5 million (operations)

WEBSITE: | www.cityofattleboro.us

GPS COORDINATES: | Latitude: 41°53'55.39" N; longitude: 71°20'12.63" W

Environmental Company) — at the headworks and in the solids area, which houses the blended sludge tanks and filter press. A carbon filter deals with odors in the grease and scum collection area.

Plant processes are controlled by a SCADA system with eight terminals around the plant that allow operators to switch equipment, make process changes, and adjust air rates or turn the blowers on or off. The system also displays and controls pumping and sludge wasting rates and chemical tank and wet well levels. For preventive maintenance, Attleboro uses JobCalc maintenance software (Hach), which assigns work orders and keeps track of work history.

SOLVING PROBLEMS

In New England, an old-fashioned expression is, “Solve your own problems.” It perfectly represents the attitude with which the Attleboro staff attacks challenges. Total nitrogen removal was perhaps the biggest hurdle.

“We had just finished our \$30 million upgrade, and we had inquired about a total nitrogen limit in our new permit,” explains Kennedy. “A TMDL [total maximum daily limit] had not been established for nitrogen on our river, and we believed we would not have a limit when our permit was renewed.”

As it turned out, Attleboro was indeed subject to new nitrogen limits. Given the full upgrade, Kennedy and the city council were not keen on getting funds for more equipment, so plant team members concentrated on what they had.

In the original plant design, four aerators were used in a small first-stage biological system, followed by a set of first-stage clarifiers. The idea was to



Kerri Lopes (left) and Bill Johnson, head operators, have duties that include monitoring the plant on the SCADA system and completing documentation for regulatory agencies.

reduce BOD and prepare the wastewater for the second stage. “They ran it a while, but it didn’t really work,” Kennedy says. Since then, Attleboro has achieved full nitrification in the second stage, saving on operational costs, while using the first-stage system to enhance copper precipitation.

LOOKING UPSTREAM

Faced with the new nitrogen limits, Attleboro convinced the U.S EPA to allow the plant to experiment with a full-scale nitrogen removal pilot plant. “We took our existing configuration of aerators and made that work,” says Kennedy. “We converted four of the 10 second-stage aerators to anoxic zones and added mixers along with a carbon-source chemical, and we are able to denitrify.”

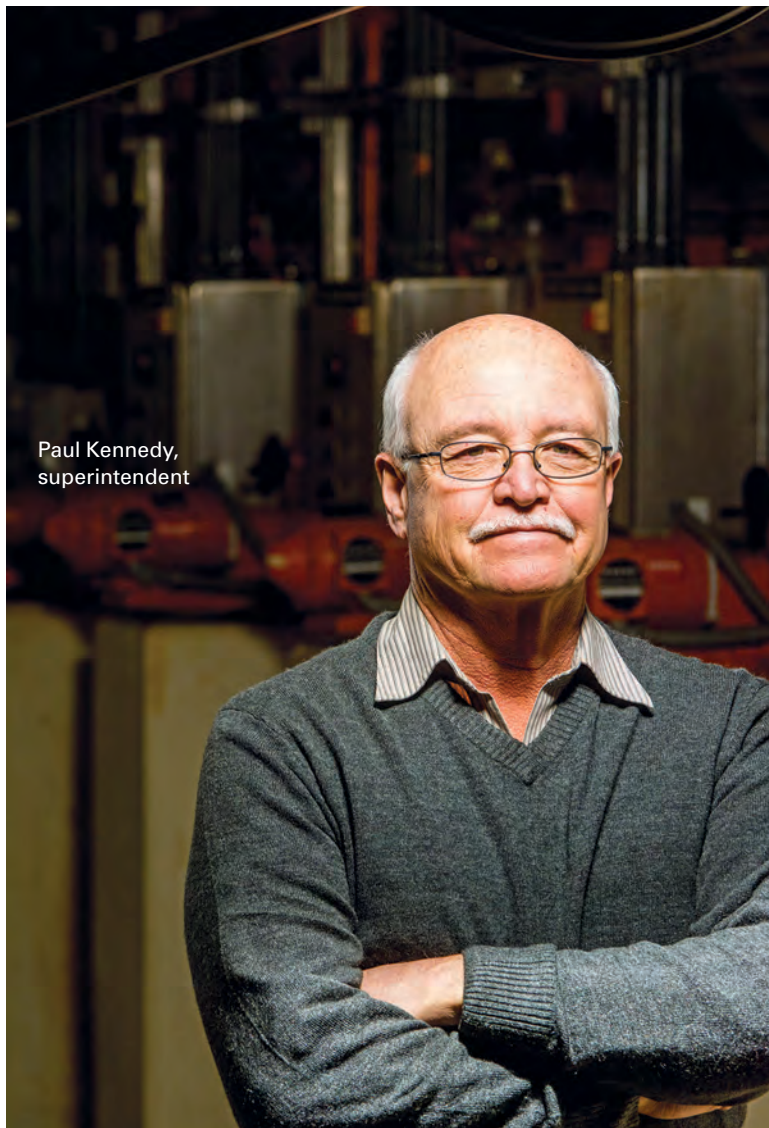
The full-scale pilot plant has been running for about two years, and the results of nitrification-denitrification sequence have been good, especially after an outside ammonia issue was identified and removed. “A local industrial plant had been discharging ammonia to the sewers at 7,000 to 8,000 ppm total Kjeldahl nitrogen [TKN],” Kennedy says. “We could not meet our permit [8 mg/L] with what they were discharging.”

The solution involved an ammonia recovery system at the industrial plant that reduced its discharge to 200 to 300 ppm TKN. “We worked with the industry and the city,” Kennedy says. “There was no TKN limit in the city ordinance. We revised the local limits and issued a compliance order.”

“In the next two to three years, we’re looking at renewal of our NPDES permit. We expect that at least we’ll have to go from 8 to 5 mg/L on total nitrogen.”

PAUL KENNEDY

Success followed. With the pre-treatment order in place and the anoxic zones and carbon source fully functioning, Attleboro has done well meeting its total nitrogen permit. At times, the plant has recorded effluent values of 2 to 3 mg/L. Smart use of clarifiers has solved other problems. Attleboro slakes lime and adds the slurry to wastewater at headworks and copper is removed in the primary sludge. The copper comes from household plumbing and from septage. “We have a copper limit of 13 micrograms per liter on a monthly average,” says Kennedy. “With pH in the 7.5 to 7.8 range, the lime successfully precipitates copper into the sludge. If we’re in the mid to low pH 6 range, the copper will go back into solution and we’ll see it in the effluent.”



Paul Kennedy,
superintendent



The team at the Attleboro Wastewater Treatment Facility includes, from left, Ernie Hicks, hoisting equipment operator; Tony Diaz, plant repairman; Bill Johnson, head operator; Paul Kennedy, superintendent; Rick Boisse, hoisting equipment operator; Tom Hayes, assistant superintendent; Michael Hills, collection foreman (wearing hat); Kevin Douglas, plant repairman; Kerri Lopes, head operator; John Reed, assistant pretreatment coordinator; Frank Lopes, special motor equipment operator; Diane Beland, lab manager; and Ernie Gaudet, senior lab technician.

While copper precipitation works well, the lime had created a maintenance issue as it built up in the clarifier. “However, once we started adding lime at headworks into our grit chamber, maintenance issues were drastically reduced because now the bulk of the lime grit settles in our grit chamber and is mechanically removed.

In addition to its industrial pretreatment requirements, which affect 17 industries, Attleboro maintains an aggressive FOG (fats, oil and grease) program covering 109 commercial businesses.

THE ROAD AHEAD

Not content to rest on their laurels — even with the new award plaque hanging in the lobby along with congratulations from the mayor and council — Kennedy and his staff are keenly aware of future challenges. “In the next two to three years, we’re looking at renewal of our NPDES permit,” says Kennedy. “We expect that at least we’ll have to go from 8 to 5 mg/L on total nitrogen. I think they may want us to go lower on aluminum as well.”

That could be a problem: “Right now, we add polyaluminum chloride for phosphorus removal. We use a dual feed — ferric chloride at the headworks and polyaluminum chloride in the aerators — and it works really

WINNING TEAM

Paul Kennedy, Attleboro treatment plant superintendent, leads a talented staff that won the 2013 Best Medium Plant Performance Award from the Massachusetts Water Pollution Control Association. Kennedy is supported by Tom Hayes, assistant superintendent, and Vicki Lynne Dulude, administrative clerk. Other team members are:

Facility operations: Mark Plemmons, Bill Johnson, Kerri Lopes, Joe Mendonca and Tony Zanfardino, head wastewater operators; Geof Higgins, John Moriarty, Richard Limoges and Joe Capraro, plant operators; Brendan McKearney and Chris Strohl, operators in training; Tim Trinidad, landfill operator; and Frank Lopes, assistant and special motor equipment operator

Maintenance: Gunther Illic, foreman; Dave Challis, working foreman; Mark Vassar, Kevin Douglas and Tony Diaz, repairmen; Dan Healy, master electrician; and Adam Dumont, electrician’s helper

Industrial pretreatment: Aaron Dumont, coordinator; John Reed, assistant coordinator

Laboratory: Diane Beland, manager; Ernie Gaudet and Steve Struhar, senior technicians

Collections system: Michael Hills, foreman; Ernie Hicks, working foreman; Tom Parker, Gary Bourgette, Rob Dion and Rick Boisse, hoisting equipment operators



Paul Kennedy, plant superintendent, strives to create a work atmosphere that fosters innovation.

**Attleboro Wastewater Treatment Facility
PERMIT AND PERFORMANCE**

	INFLUENT	EFFLUENT	PERMIT
BOD	203 mg/L	1.1 mg/L	5 mg/L summer 15 mg/L winter
TSS	290 mg/L	1.1 mg/L	5 mg/L summer 15 mg/L winter
Total Nitrogen	N/A	6.0 mg/L	8 mg/L
Phosphorus	4.1 mg/L	0.05 mg/L	0.1 mg/L

well.” The plant can meet its current limit of 122 micrograms per liter for aluminum, but if the limit is lower, that will be difficult.

Since the plant discharges into a river that is part of the Narragansett Bay watershed, Kennedy is well aware of water-quality standards for the

stream and regularly attends meetings that discuss control strategies. “We’re doing a good job of cleaning up the Ten Mile River,” he says. “Whether it’s phosphorus, metals or coliform, our numbers are good. We didn’t win that award for nothing. The biggest problem is stormwater and snow melt. It’s not regulated, and a lot of the pollution is coming from runoff from impervious surfaces.”

Whatever lies ahead, Attleboro will figure it out. “I’ve been here 33 years,” says Kennedy. “We’ve done a lot of things that you won’t find in the book.” Maybe not, but they seem to work. **tpo**

featured products from:

Aqua-Aerobic Systems, Inc.
877/271-9694
www.aqua-aerobic.com

Cole-Parmer
800/323-4340
www.coleparmer.com

Duall, a CECO Environmental Company
989/725-8184
www.dualldiv.com

Environmental Operating Solutions, Inc.
866/642-7621
www.eosenvironmental.com

Evoqua Water Technologies, LLC
815/623-2111
www.evoqua.com

Flygt - a Xylem Brand
855/955-4261
www.flygtus.com

Hach Company
800/227-4224
www.hach.com

MERRICK Industries, Inc.
850/265-3611
www.merrick-inc.com

Philadelphia Mixing Solutions
800/956-4937
www.philamixers.com

Walker Process Equipment, A Div. of McNish Corp.
800/992-5537
www.walker-process.com
(See ad page 23)

Extra! Extra!

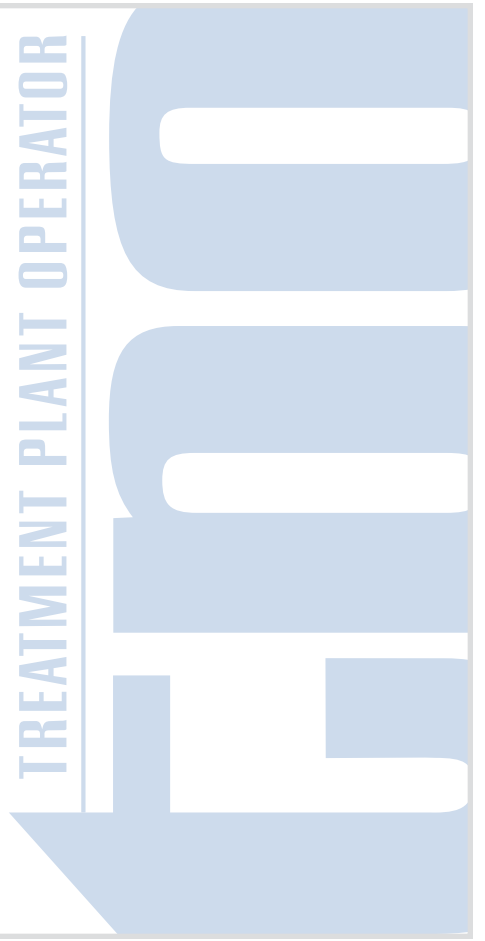
Want More Stories?

Get more news,
more information,
more features with

Online Exclusives

Exclusive online content for
Treatment Plant Operator

www.tpomag.com/online_exclusives





EFFICIENCY AT EVERY TURN

SINCE 1960



The Triton Screw Centrifugal Pump combines the benefits of Vaughan's UNMATCHED RELIABILITY with the advantages of highly efficient, non-clog performance. Triton's screw centrifugal impeller is ideal for handling thick sludges, large solids, shear sensitive fluids and delicate or highly abrasive material.

- Steep performance curves
- Heavy-duty power frames
- Expedite pumps and parts availability

See videos, drawings, and details at ChopperPumps.com or call 888.249.CHOP



 **Vaughan**
Unmatched Reliability

Up From Under

A COLORADO SANITATION DISTRICT PARTNERS FOR A SUSTAINABLE APPROACH TO MANAGING PRODUCED WATER FROM THE REGION'S OIL AND GAS FIELDS

By Ted J. Rulseh



Brian Woods

Much is written about fracking fluid and whether wastewater treatment plants can and should accept it. But another kind of water from oil and gas production also needs proper handling, and Colorado's Clifton Sanitation District is part of a promising potential solution.

Fracking fluid is used in hydraulic fracturing of shale formations to release natural gas that is otherwise unavailable. It contains sand and various chemicals. After it is injected deep in the earth, much of it returns to the surface and needs treatment.

Produced water is water present in underground oil and gas formations; it comes to the surface during conventional drilling. Clifton Sanitation, in western Colorado, has teamed with Concord Produced Water Services to test the feasibility of treating the water, which typically is placed in evaporation ponds.

The plan calls for Concord to install a pretreatment system at Clifton Sanitation's 2.5 mgd (design) oxidation ditch wastewater treatment plant. The Clifton plant would further treat the effluent from the Concord system, and in the process earn revenue. It's a produced water management approach that may have potential to expand to other treatment plants in the region.

Brian Woods, district manager for Clifton Sanitation, talked about the project in an interview with *Treatment Plant Operator*.

tpo: Where exactly does this produced water come from?

Woods: Here in Western Colorado, we are in the second big boom for oil and gas. Produced water as a rule is generated for the life of the well. My understanding is that for every one gallon of product they pull out of the hole, there are four to five gallons of produced water that has to be taken care of. It tends to be lumped in with fracking, and that leaves people with a bad taste — but produced water is a very different item. We hope to take produced water from the Piceance basin, which is world renowned for its natural gas reserves.

tpo: What is typically done with produced water?

Woods: Produced water can be reinjected into the wells or used for dust control on the production sites. However, only a certain amount of the water can be handled in those ways, and so eventually some needs to be treated. In our area, it is generally placed in evaporative ponds. This leads to two potential concerns: air emissions and a solid waste product — the pond sediment — that eventually will require disposal on a large scale. There is concern in the oil and gas industry that ultimately the material may need to go through an additional treatment process.

tpo: What does produced water contain that is of potential concern?

Woods: It can contain a blend of hydrocarbons, although less than is typical of fracking water. For the most part the hydrocarbons are easily separated, and there is a financial incentive to capture them for beneficial use. But some hydrocarbons can't be as easily removed. The water can also contain a variety of metals.

The biggest concern from our treatment plant's perspective is the high concentration of naturally occurring total dissolved solids associated with the oil shale formations in our region. These formations are naturally high in salts, and when water is introduced, high concentrations of salt are dissolved, creating levels of TDS that are excessive and difficult to treat conventionally. The Concord pretreatment process would be removing most of the TDS before discharge to our system. That is a key component in the process.

tpo: How did this project with Concord come about?

Woods: Clifton Sanitation started receiving holding tank wastewater from man camps. As long as it isn't in a septic condition, we can treat it in compliance with federal or state requirements. After discovering this activity, a local friend, Shawn Marsh, owner of Marsh Trucking, a company that hauls produced water, inquired about the possibility of treating produced water at our facility. He introduced me to Eric Gopsil, who at the time was vice president of Concord Produced Water Services. Previously, Eric had been a construction supervisor for a company that builds water and wastewater treatment plants.

Shawn and Eric are solid people, and I felt comfortable having discussions with them. One thing led to another, and Eric took the ball and began to run with it. We started researching what it would take to get a pretreatment facility permitted by the U.S. EPA and the Colorado Department of Public Health and Environment [DPHE].

“I believe we need to support the industry that provides us with energy resources. Someone has to seek solutions, and being a part of that is important.”

BRIAN WOODS

tpo: What was your experience with the permitting process?

Woods: We initially asked if we could perform a pilot study to see if what we were proposing would be feasible. As it turned out, to reach the point where we could test the process, we had to go through the full permitting process. Lisa Knerr, who oversees the pretreatment program for the CDPHE, worked with Clifton and Concord and our consultants to develop a Notice of Discharge Requirements [NDR] so that we could get the project off the floor.

There were a few other steps. The EPA had to provide a ruling on whether

TOP SKILLS that a water operator needs NOW!

Refresh your skills while learning how to prepare for the certification test. These courses introduce the basic functions and responsibilities of Level 1 operators, as well as water treatment processes, their uses, characteristics, sizing, and calculations and analyses of these processes.

Water Treatment Operator Courses begin September 15!

- EL165 | Water Treatment Operator Level 1
- EL166 | Water Treatment Operator Level 2
- EL167 | Water Treatment Operator Level 3

For more information, or to view our full list of courses, visit www.awwa.org/distancelearning.

Each course lasts 60 hours and consists of pre-recorded presentations, online learning activities, videos, quizzes and evaluations.

Cost: \$375/members
\$525/nonmembers



 American Water Works Association

Concord would be considered a categorical industry. The EPA ruled that they were not, and therefore the NDR from the state would apply.

tpo: Assuming this project ultimately goes forward, what is the benefit to your district?

Woods: We are able to take unused capacity in this plant, which went online in 2008, and basically lease it to Concord on a pay-as-you-go basis, at a rate that is financially viable for them. So we are able to use that capacity until development comes back up. It enables us to evaluate potential early debt reduction and possibly fund future capital projects. It also gives us an opportunity to control and possibly even reduce our service fees.

tpo: How would Concord benefit from the project?

Woods: They benefit from having a permitted facility, monitored and regulated by the government, and they can sell that to their oil and gas customers. It's a cradle-to-grave solution for produced water. Air emissions are controlled in a closed-loop system. Both the solids stream and the water stream are taken care of simultaneously and continuously. The minimal amounts of solids are dewatered, stored for a short time, and tested for disposal, whether at a landfill or by more stringent practices. The water stream is treated by Clifton Sanitation and discharged under the water-quality standards established by the EPA.

Concord will have to sell this concept to the oil companies. At the end of the day this may be more cost-effective for them than existing practices, even if they have to pay a little more. The benefits have the potential to be valuable to all parties.

tpo: What is the current status of the project and what is the timetable for completion?

Woods: Right now we have the necessary state and EPA permits — that process took about 18 months. Clifton Sanitation has tentatively pre-

pared a discharge agreement with Concord. The final step is to receive a conditional use permit from the Mesa County Commission. We expect to have all the permitting in place and to be able to start up sometime in June or July unless there are any unforeseen obstacles.

tpo: What will be involved in the Concord pretreatment process?

Woods: Concord will receive produced water from trucks and transfer it to above-ground storage tanks. The water will be treated to remove organics, TSS and heavy metals. That treated water will be sent to clean storage tanks and then run through a reverse osmosis process to remove dissolved solids. The water will then be sampled and tested to ensure compliance with the local and federal permitting requirements and then discharged to our facility for additional treatment.

tpo: What will the water look like when it comes out of Concord's process and into the Clifton treatment plant?

Woods: After meeting discharge compliance the water will have acceptable levels of TDS, BOD and heavy metals and will be cleaner than most residential wastewater received at the facility. We expect the water to actually dilute the influent at the facility.

tpo: Assuming your venture is successful, is this something that could be replicated by other communities in oil- and gas-producing areas?

Woods: I really do think so — it could be beneficial to other communities. I believe we need to support the industry that provides us with energy resources. Someone has to seek solutions, and being a part of that is important. If we can demonstrate success, I think facilities in a lot of other communities could be equally successful. **tpo**

On Autopilot

A TEST OF A REAL-TIME NITROGEN CONTROL DOCUMENTS SUBSTANTIAL ENERGY SAVINGS AND IMPROVES PROCESS CONSISTENCY AT A MICHIGAN CLEAN-WATER PLANT

By **Scottie Dayton**

Listening to operators discuss their experiences with nitrogen control at the 2012 WEFTEC Conference convinced manager Michael Lunn of the Grand Rapids (Mich.) Wastewater Treatment Plant that nitrification was coming. It also promised energy savings.

Lunn and Laron Morgan, technical controls supervisor, researched ammonia analyzers for the South Plant treatment train. When the team contacted Hach, the window of opportunity flew open. “They had a real-time nitrogen controller in European facilities and were looking for a pilot plant in the U.S.,” says Lunn.

The city agreed to the test and purchased two AMTAX sc ammonia analyzers, a SOLITAX sc suspended solids probe, the sc1000 digital controller and the RTC-N control module.

The energy-saving project qualified for a rebate program sponsored by Consumers Energy, the local electric utility. Based on energy savings calculated by the utility, the city received a one-time \$58,728 rebate check last December. “It was 10 percent more than what I had estimated the savings to be at 8 cents per kWh,” says Lunn. “Annually, the technology should save the city more than 735,000 kWh and \$62,000.”

NUTRIENT CONTROL SAVINGS

The 61.1 mgd (design) plant averages 42.2 mgd. Its two parallel activated sludge processes are called the North Plant and South Plant. After UV disinfection, effluent discharges to the Grand River. The 29 mgd (design) South Plant averages 20 mgd. It had three parallel 360- by 64- by 15-foot-deep aeration basins, each with five 100 hp turbine draft tube mixers. Spargers on the bottom dispersed fine bubbles from two 500 hp multi-

“Annually, the technology should save the city more than 735,000 kWh and \$62,000.”

MICHAEL LUNN

stage blowers. The system equaled 2,500 hp total connected power. The base connected load was 2,000 hp with one blower in service.

In 2005, the South Plant switched to nutrient control. Modifications included an anoxic zone ahead of the aeration basins and replacement of the original mixers with 9-inch Sanitaire – a Xylem Brand tapered ceramic fine diffusers. The contractor also installed three single-stage 1,000 hp Turblex centrifugal blowers (Siemens Energy) with dual vane control that transfer 91,800 pounds of oxygen per day. Each operates at 9 psi and delivers 20,000 cfm of airflow, drawing eight to 12 run amps. The constructed value of blowers and controls was \$1,845,000.



PHOTO COURTESY OF GRAND RAPIDS WASTEWATER TREATMENT PLANT

Michael Lunn, Grand Rapids plant manager, checks the monitor screen on the facility's nitrogen control system supplied by Hach.

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 715/277-4094.

“The annual energy equivalent for the original system was \$546,000,” says Lunn. “The new system was \$204,800 per year with a projected annual savings of \$341,200. It was the best technology available.”

SIMPLE INSTALLATION

Last March, Hach technicians installed the plug-and-play nitrogen control components and set the proportional-integral-derivative (PID) control loop parameters. Plant operators used the No. 1 aeration basin as the control and the No. 2 basin as the test tank.

“We inserted the solids probe and put an ammonia analyzer at the head and foot of the basin,” says Lunn. “The first test was moving the ammonia setpoint from 2 mg/L to 4 to 6 mg/L to see if it worked. Our permit limit is 8 mg/L.” Over two weeks, the system reacted quickly and accurately.

They then flipped the tank into nitrogen control with limiting setpoints of 1.5 to 5 ppm oxygen, running it for four weeks. At the end of July, operators put all three tanks in ammonia control and tracked it. The system outputs a dissolved oxygen setpoint based on the ammonia load entering and leaving the aeration basin, triggering the blowers to run at the optimal level for nitrification while reducing wasted energy.

GREATER FLEXIBILITY

“The old blower control system wasn't flexible,” says Lunn. “It accepted one number until someone changed it, so we'd wind up with 0.1 mg/L ammonia because of over-aeration.” Adjusting aeration based on real-time data made the process more consistent, and a command on the plant's SCADA system enabled operators to switch tanks from DO setpoint to ammonia control and back again.

As testing progressed, the operators changed only two parameters. First, they adjusted the maximum recirculation setting for the plant's return activated sludge. “The parameter was the default — 300 gpm for a small facility — and we needed 20 mgd,” says Lunn. “Then we smoothed out the proportional gain on the PID to match our plant. Every facility has to do it.”

The success of the pilot study convinced the city to install a Hach system in the North Plant's four aeration basins. That project also will be eligible for the Consumers Energy rebate program. **tpo**



Aeration Works is the largest and most respected wastewater aeration maintenance & service firm in the world. From system evaluations to system installs the highly trained team at Aeration Works can help you with all your aeration needs.

- municipal and industrial
- servicing ALL brands
- 1,000's of installations globally
- system evaluations/inspections
- performance contracts
- maintenance programs



For a FREE system evaluation - Give us a call!

Call us at 877.334.2478 or visit us at www.aerationworks.com

A division of Environmental Dynamics International



Diffuser Express™ stocks 100's of replacement diffusers, membranes, pipes and specialty items for your new or existing water and wastewater treatment facility.

Our trained Aeration Experts are here to help you.

**25% Off
all new
customer
orders!**

*"Thank you for
your order"*

— Kati



Aeration replacement parts for ALL brands

Same day shipping on in-stock parts

Call us at 877.334.2478 or visit us at www.diffuserexpress.com

A division of Environmental Dynamics International

The BurstMinder system is designed for immediate detection of major breaks in water mains that would result in significant water loss if not repaired.



Fast Alerts for Broken Pipes

A FLOW- AND PRESSURE-SENSING TECHNOLOGY WITH TIME SYNCHRONIZATION HELPS WATER SYSTEMS QUICKLY DETECT AND MINIMIZE LOSSES FROM BURSTS IN DISTRIBUTION MAINS

By Ted J. Rulseh

Many technologies can help detect leaks on a water distribution system. Acoustic sensors can be deployed in the field by attachment to hydrants or valve boxes. Field personnel can actively listen for leaks with portable devices.

These technologies are great for ongoing monitoring of a distribution system and detecting and localizing slow leaks. But what about the bigger leaks — those that happen when pipes burst, as many did during the wickedly cold winter just past? Here, rapid response can head off major water losses and property damage and shorten service interruptions.

Syrinix, based in the United Kingdom, offers a solution in the BurstMinder intelligent pipeline monitoring system. It's designed to alert water utilities immediately to main bursts and to give the time and relatively precise location of the event, so that crews can respond promptly. Dale Hartley, business development manager, talked about the technology in an interview with *Treatment Plant Operator*.

“Suppose that we have a sensor at the entrance to a district metering area. If there were a burst somewhere downstream in that metering area, the sensor upstream at the entrance would see an increase in flow and a drop in pressure.”

DALE HARTLEY

tpo: What is new and different about this technology?

Hartley: In general, there are two types of leak detection technology. There is vibro-acoustic leak detection, which involves acoustic sensors mounted on or even in the pipeline. And then there is flow and pressure sensing, which is what the BurstMinder solution uses.

tpo: How does your technology detect and localize main breaks?

Hartley: BurstMinder doesn't use acoustic or vibration technology. It uses flow and pressure sensing with extremely high time synchronization. To my knowledge, no one else has done it this way. The system uses small, easily deployed, battery-powered monitors to measure flow and pressure. To sense pressure, it uses an integrated transducer that samples at a high frequency, in the region of 100 times per second or more. To monitor flow it attaches to an existing flowmeter. It uploads data wirelessly to a cloud-based server once a day, or at any time it picks up a burst occurrence.

tpo: How exactly does the interplay between flow and pressure indicate a burst?

Hartley: Suppose that we have a sensor at the entrance to a district metering area. If there were a burst somewhere downstream in that metering area, the sensor upstream at the entrance would see an increase in flow and a drop in pressure.

tpo: How do the measurements of flow and pressure lead to location of the burst?

Hartley: Besides the sensor at the entrance to the district metering area, we would have deployed within that area additional BurstMinder units. All these are linked by way of software. While the sensor upstream of the burst sees an increase in flow and a drop in pressure, a sensor downstream from the burst would see a decrease in both flow and pressure. That suggests, through the code running on the software and the algorithms, that somewhere between those two points there is a burst.

The sensing units are linked by GPS time synchronization with extreme accuracy, plus or minus 0.01 second. With that accurate time stamping and knowledge of the distance between the sensors along the pipeline, a leak can be located to within about 10 meters [33 feet].

tpo: Can you give a general idea of how many sensors a utility would need to monitor its system effectively?

Hartley: It really depends on the utility's priorities. They will have a budget for finding bursts or reducing water loss, but they will not have enough money to monitor the whole network, so they will prioritize. Based on the available budget, in a given year they may decide to look at an area that constitutes, say, 5 percent of the entire network, perhaps because historically it has been a bad area for water loss.

Lone Worker Safety Systems

Concerned about lone worker safety? Have peace of mind! Grace Industries emergency signaling 'man-down' alarms & monitoring systems locate your workers in an emergency. Our safety solutions range from portable, worker worn devices to fixed-mount alerting systems perfect for any size facility.

- **Easy to Use**
- **Intrinsically-Safe**
- **No Monthly fees**
- **Rugged and Reliable**
- **Waterproof**
- **Modular Design**



GRACE
INDUSTRIES, INC.

Phone 724-962-9231
sales@graceindustries.com
www.graceindustries.com

**Every Worker Should
Feel Safe On The Job**

MADE IN
USA

tpo: Is this technology designed to detect slow leaks? Or only actual water main bursts?

Hartley: BurstMinder is not designed to pick up small leaks that may run for years without being detected — as important as those are. It's designed to pick up when a burst occurs in a distribution pipe. These events will result in significant water loss, even though it may not be visible at the surface. In a matter of seconds after it occurs, the technology will alert the utility by SMS text and email that there has been a burst, and give a reasonably precise location.

tpo: How are the pressure sensing and flow monitoring devices deployed?

Hartley: They are typically deployed in meter chambers in the water utility network, where a flowmeter and pressure sensor are already present. The BurstMinder unit connects to those devices. It operates on its own bat-

“ [The sensors] are typically deployed in meter chambers in the water utility network, where a flowmeter and pressure sensor are already present. The BurstMinder unit connects to those devices. It operates on its own battery.”

DALE HARTLEY

tery. Typical battery life is three years. The device doesn't have to be returned to the manufacturer when the battery is dying. The battery can be replaced locally. We offer a variety of battery options, including a lithium-ion pack in a casing with a fully submersible IP68 rating. **tpo**

**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.

Publishing environmental trade magazines since 1979.

top performer
wastewater:

PLANT

Judge This Book by Its Cover



STEADY IMPROVEMENTS KEEP A SMALL SECONDARY PLANT IN TEXAS COMPLIANT WITH REGULATIONS AND IN PEAK OPERATING CONDITION DESPITE BUDGET LIMITATIONS

STORY: **Jim Force**
PHOTOGRAPHY: **Eric Christian Smith**



The Willis Wastewater Treatment Plant received the 2013 Texas Plant of the Year Award in its size category from the Water Environment Association of Texas.

IF YOU JUST HAPPENED TO POP IN AT THE WILLIS Wastewater Treatment Plant, the team would not object to giving you a tour.

That's because the plant and the grounds are always in tip-top shape, thanks to the hard work of Gretchen Baldwin, chief operator. The grass is mowed, the equipment clean, the floor spotless, everything painted. In the words of Arthur Faiello, public works and utilities director for this south Texas city of 6,000, "We're always tour-ready."

While some plants want to spend as little as possible, that's not the approach at Willis, Faiello says. He believes that since the city has made an investment in effective wastewater treatment, the facility's appearance should reflect the money spent on it.

The approach is not only pleasing to the eye — it has paid off in the 2013 Texas Plant of the Year Award from the Water Environment Association of Texas (WEAT) for facilities treating less than 1 mgd.

PLANT OPERATIONS

The current wastewater treatment plant dates to 1977, when it was built to replace a facility that had reached the end of its useful life. The original plant (0.4 mgd design) used an oxidation ditch equipped with brush aerators, secondary clarifier and chlorine contact chamber. Biosolids were spread on drying beds.

Since then, Willis has expanded the plant capacity to 0.8 mgd and has made additions to the chlorine contact chamber, the aeration and mixing process, and the biosolids digestion and dewatering processes. Influent screening has been added.

Today, the plant handles about 0.5 mgd on average. Wastewater is collected through 28 miles of gravity pipes and 17 lift stations. The CleanFlo Spiral screen (WesTech Engineering) in the headworks removes rags and debris, and the wastewater passes to the racetrack-style oxidation ditch, where pontoon-type Tornado aerators (AEROMIX Systems Inc.) supply oxygen and mix the contents.

Willis (Texas) Wastewater Treatment Plant

BUILT: | 1977, several upgrades since

POPULATION SERVED: | 6,500

SERVICE AREA: | Willis and some neighboring areas

FLOW: | 0.8 mgd design, 0.5 mgd average

TREATMENT LEVEL: | Secondary

TREATMENT PROCESS: | Oxidation ditch

RECEIVING WATER: | East Fork, Crystal Creek

BIOSOLIDS: | Aerobic digestion, dewatering, landfill

ANNUAL BUDGET: | \$250,000 (operations)

WEBSITE: | www.ci.willis.tx.us

GPS COORDINATES: | Latitude: 30°25'33.10" N; longitude: 95°28'46.62" W





LOOKING GOOD

“Willis is one of the most beautiful wastewater treatment facilities in the area,” says Arthur Faiello, the city’s director of public works and utilities. And he’s quick to credit Gretchen Baldwin, chief operator, for making it that way.

Grounds work and housekeeping are part of Baldwin’s regular routine, with some much-appreciated help from Luther Reed, city groundskeeper, during the peak growing season. “I figure it makes sense to keep it that way, so that when people show up, I don’t have to work extra hard to get it in apple-pie condition,” Baldwin says. “It looks good all the time.”

Faiello observes, “She’s a hard worker. Very few can keep up with her.” Neither can the south Texas grass, which Faiello says you can watch grow at certain times of the year.

Fresh paint adds to the good looks. “Everything in the plant has been repaired and painted,” says Faiello. “All of the piping is color-coded with flow direction arrows. Gretchen has even taken the time to paint our local high school mascot colors and logos in various places throughout the plant.”

Gretchen Baldwin, Willis Wastewater Treatment Plant manager, with Arthur Faiello, director of public works.

torical records and annual reports.” The city also maintains a well-documented safety program and has had no reportable lost-time accidents in the past year.

Baldwin maintains her Texas Commission on Environmental Quality licensure as a Class C wastewater treatment operator, and Class C water operator. Faiello maintains Class A licensure in water and wastewater, and Duke Wade, utilities supervisor, holds a Class C wastewater operator license.

BUILDING TOWARD EXCELLENCE

The road to award-winning plant operations really started in 2008. “The turnaround in this facility started with improvements in our in-house laboratory process control procedures, the acquisition of the proper equipment to do so, and staff development,” says Faiello.

“Through Gretchen’s efforts and diligence, our facility has undergone a major revitalization in performance, asset management and protection, and aesthetics. Gretchen has taken ownership of her duties and of this facility, and it shows in every aspect of the plant operations and maintenance.”

Process control was job one. “Previously, the laboratory was not really being used for process control,” says Faiello. Other than a settleometer, there wasn’t much equipment on site. Critical samples were sent out to a contract lab, which meant the staff was at least a week behind in monitoring process conditions. “We didn’t know what the conditions were until we received results back from the lab,” Faiello says.

Faiello purchased the equipment necessary to perform in-house process

Willis Wastewater Treatment Plant: Detention Times

	Aeration Basin	Clarifiers	CI Contact Chambers	PLANT TOTAL
Avg. Flow (gpd)	–	–	–	529,000
Volume (gallons)	429,000	280,000	42,000	751,000
DT, Days	0.81	0.53	0.08	1.42
DT, Hours	19.5	12.7	1.9	34.1
DT, Minutes	1,168	762	114	2,044

Treated water passes through two 45-foot-diameter, 18-foot deep clarifiers and is then gas-chlorinated via 150-pound cylinders through a Superior auto-valve (Chemical Injection Technologies) before discharge to the East Fork of the Crystal Creek.

Biosolids are aerobically digested (blowers by Hoffman & Lamson), decant thickened, then dosed with polymer and dewatered on a belt filter press (Alfa Laval Ashbrook Simon-Hartley). A contractor takes cake at 18 to 20 percent solids to an area landfill.

Performance has been exceptional. “The facility has had no compliance violations during the two years preceding the Plant of the Year award,” says Baldwin. “It exceeds the requirement of having satisfactory systems of his-

control tests. He personally trained the staff and sent them to classes on how to use the instruments. Now, Willis performs daily process control testing in the lab and adjusts the treatment process as needed.

Other improvements followed, enhancing treatment and yielding operational savings.

ATTENTION TO DETAIL

“The chlorination system was manual,” Faiello recalls. “It was ‘set it and forget it.’ But the flow varied,

“The facility has had no compliance violations during the two years preceding the Plant of the Year award. It exceeds the requirement of having satisfactory systems of historical records and annual reports.”

GRETCHEN BALDWIN

and the chlorination system was not monitored 24/7, so there was nobody there to make necessary adjustments. We were struggling with chlorination issues, and while we managed to stay in compliance, it was a daily struggle to do so.”

In early 2009, Faiello recommended and received approval from the Willis city council to purchase an automated chlorine dosing system. “It’s been a wonderful blessing,” he says. “We also installed a refrigerated composite sampler [Hach Company – Flow Products & Services], eliminating the need to rely on grab samples done by hand.”

Flow control and plant performance have been further improved through regular cleaning of lift stations, manholes, traps and the influent wet well. The plant went to regular quarterly cleaning using an outside contractor with vacuum trucks. “We began routine preventive maintenance, rather than waiting for a problem to occur,” Faiello says.

Since then, the city has purchased its own vacuum truck: “The cleaning has improved our plant operations dramatically, as well as our overall effluent quality.” The funds once used to hire the cleaning contractor now are applied to the regular plant operations budget.



Arthur Faiello, public works director, credits Gretchen Baldwin for “a major revitalization in performance, asset management and protection, and aesthetics.”

In the biosolids area, cake moisture has been reduced and hauling costs saved through fine-tuning of the belt filter press. “The steering pistons that keep the belt aligned needed work,” says Faiello. “We fixed that, as well as the proximity switches and the belt itself.”

In addition, the previous polymer feed pump for the belt filter press was a simple diaphragm-style pump. The staff replaced it with a peristaltic feed



Housekeeping is a priority at the Willis plant. Nearly all surfaces receive protective coatings.



A mechanical aerator keeps solids in suspension and introduces oxygen (Tornado aerators from AEROMIX Systems).

Willis Wastewater Treatment Plant PERMIT AND PERFORMANCE

	INFLUENT	EFFLUENT	PERMIT Daily Avg/7-day/Daily Max/Grab
TOC	31.7 mg/L	N/A	N/A
CBOD	101.2 mg/L	<2.0 mg/L	10/15/25/35 mg/L
TSS	84 mg/L	5.0 mg/L	15/25/40/60 mg/L
Ammonia Nitrogen	37.52 mg/L	0.4 mg/L	3/6/10/15 mg/L
E. coli	TNTC	2 CFU	126 daily avg, 399 daily maximum

pump, which has been much more reliable. “We’re using less polymer, yet getting good cake solids,” Baldwin says.

Other changes have also made a difference. “For all in-plant water, we now use plant effluent,” Faiello says. “And we have made a habit of using protective coatings on everything. All structures are painted, up to and including our standby generators. We’re preserving our assets against corrosion, and improving their longevity.”

TIGHTENING DOWN FLOWS

The improvements at the plant and in the collection system have made the city less dependent on an old arrangement that diverted high flows to the neighboring city of Conroe for treatment.

“The interconnect has been in place for some time, and it was implemented as a means for peak shaving,” says Faiello.

“We had a significant infiltration and inflow problem, and heavy rains sometimes resulted in flows beyond the permitted capacity of our treatment plant. We still use the interconnect, but with our sewer improvements, we don’t need it as much for high flows.” Flow still passes to Conroe when the

Willis plant is taken down for maintenance of the oxidation ditch or wet well. It’s a luxury to have available, but the city saves money by using it less often.

When Willis won the Plant Excellence Award, WEAT president John Bennett noted that the plant has not only always been in compliance, but also “looks beautiful.” That’s by design.

Faiello observes, “To some people, a wastewater treatment plant doesn’t have to look good and be clean because it’s a wastewater plant — there’s bacteria everywhere. I believe because it’s a wastewater treatment plant with bacteria everywhere, that’s all the more reason for it to be clean.”

And the improvements and fix-ups don’t have to cost a fortune. “While we’ve made changes and optimized processes over the last five years,” says Faiello, “our operations budget has actually been reduced.” They’re doing more with less. **tpo**

featured products from:

AEROMIX Systems, Inc.
800/879-3677
www.aeromix.com

**Alfa Laval Ashbrook
Simon-Hartley**
800/362-9041
www.alfalaval.us/wastewater

**Chemical Injection
Technologies, Inc.**
772/461-0666
www.chlorinators.com

**Hach Company –
Flow Products & Services**
800/368-2723
www.hachflow.com

**Hoffman & Lamson, Gardner
Denver Products**
866/238-6393
www.hoffmanandlamson.com

WesTech Engineering, Inc.
801/265-1000
www.westech-inc.com

Municipal & Industrial MAINTENANCE SERVICES



SEWER & CATCH BASIN CLEANING Single and double-pump jet-vac combination units with line jetting capabilities of 175 gpm. Catch basin cleaning available with per hour or per basin pricing.



SEWER TELEVISION INSPECTION

We have the CCTV equipment and experienced technicians to perform any type of mainline or service lateral inspection you need. Powered by the latest computers and software.



WET/DRY VACUUMING Jobs that used to take days are completed in hours. Our custom-built vacuum vehicles can quickly cleanup the toughest, dirtiest material, no matter where it's located..

Other Services Available:

- Sewer Joint/Lateral Sealing
- GPS/GIS Data Collection
- No-Dig Cipp Point Repairs
- Manhole Rehabilitation
- Digester/Tank Cleaning
- Pit, Pond & Lagoon Cleaning
- Sludge Dewatering
- Water Blast Cleaning and much more.

All Work Backed by Our Unmatched Guarantee: You must be satisfied or you pay absolutely NOTHING for our services.



Call Toll Free **1-800-621-4342**
CARYLON CORPORATION

2500 W. Arthington Street ▪ Chicago, IL 60612 ▪ Fax: 312-666-5810

Visit Us On the Web: www.caryloncorp.com



Pumps, Drives, Valves and Blowers

By Craig Mandli

Blowers

ROTARY LOBE BLOWER

Tyr rotary lobe blowers from Busch Vacuum Pumps and Systems are vacuum and low-pressure generators that operate with piston ring seals. Available in six sizes, they can be adjusted by selecting the drive and variable speed. Due to the noncontacting design, operating fluid is not required in the compression chamber. Automatic belt tensioning between the drive and blower stage eliminates manual checking and re-tensioning of the v-belts. The operating pressure, filter and gear oil level can be monitored via displays on the housing. Depending on the version, acoustic insulation reduces noise. An optional acoustic enclosure can reduce noise by another 15 to 20 dBA. **757/463-7800; www.buschusa.com.**



Tyr rotary lobe blowers from Busch Vacuum Pumps and Systems



MB blowers from Eurus Blower

BI-LOBE AERATION BLOWER

MB bi-lobe aeration blowers for MBBR, sludge and equalization tanks from Eurus Blower are rated to 15 psig and flows to 3,950 cfm. They have integral-shaft ductile iron impellers, dual-splash lubrication, oversized roller bearings, piston ring air seals, viton lip seals, and low vibration and noise. Packages have integrated intake filter/silencers with washable filter media, heavy-duty base/integrated discharge silencers, vibration dampers, OSHA guard and a V-belt drive with automatic belt tensioner. Options include motors, check valves, safety valves, flexible connectors and sound enclosures. **630/221-8282; www.eurusblower.com.**

HIGH-SPEED CENTRIFUGAL BLOWER

The Hoffman Revolution high-speed centrifugal blower from Hoffman & Lamson, Gardner Denver Products, delivers up to 45 percent energy savings, provides high reliability with little maintenance, and is factory prewired and tested in an ergonomic sound enclosure for plug-and-play operation. A small footprint reduces installation costs. It has a 1-meter certified sound rating below 80 dBA, a self-contained cooling system, air-filtration elements, high-efficiency impeller, magnetic smart bearings and blow-off valve assembly. **866/238-6393; www.hoffmanandlamson.com.**



Hoffman Revolution centrifugal blower from Hoffman & Lamson, Gardner Denver Products

READY-TO-USE BLOWER PACKAGE

Com-paK blower packages from Kaeser Compressors arrive ready for use and include a motor with automatic V-belt drive tensioning,



Com-paK blower packages from Kaeser Compressors

inlet/outlet silencers, full sound enclosure, starters/drive, a full complement of sensors and an onboard controller. Units are available in wye-delta start and variable-frequency drive. All routine maintenance points are accessible from the front, and utility connections are in the back. All pipe connections and

cooling air apertures are at the rear, making side-by-side installation possible. An Ethernet port and built-in Web server

enable remote access and integration into wastewater treatment plant control/monitoring systems. ModBus, Profibus, Profinet and Devicenet industrial communication interfaces are available. **877/586-2691; www.kaeser.com.**

BLOWER PACKAGE SYSTEM

Qube Packages from Tuthill Vacuum & Blower Systems can be used for aeration where the blower supplies oxygen to the aeration tank or pond, for basic sewage and sludge movement, and for transfer of digester gases. Packages come with a Qx rotary positive-displacement blower. A maintenance-friendly noise enclosure with easy access includes an instrument panel with process gauges, and an oil drain/level gauge accessible from the front. The mounting base includes integral fork truck pockets, automatic V-belt tensioning with belt replacement indicator and a relief valve. The package is suitable for outdoor installation and is offered with flows from 85 to 950 cfm and pressure ranges up to 18 psig. **417/865-8715; www.tuthillvacuumblower.com.**



Qube Packages from Tuthill Vacuum & Blower Systems



Quiet Pulse blower packages from United Blower

TRI-LOBE BLOWER PACKAGE

Quiet Pulse blower packages from United Blower have tri-lobe blowers with pulsation control and helical gears that eliminate inlet silencers and reduce the discharge silencer size. Direct mounting of the inlet filter/silencer to the blower inlet flange eliminates flex joints.

Automatic belt tensioning reduces belt slippage and wear, preventing premature blower-drive bearing failure. The design

eliminates a separate inlet filter and silencer, providing smaller, lighter, maintenance-free units that allow for smaller noise enclosures. Acoustical foam provides noise attenuation; access on three sides and the roof facilitates maintenance. **770/479-3000; www.unitedblower.com.**

Couplings/Fittings/Components

SCREW PUMP COMPONENTS

Evoqua Water Technologies supplies original-equipment Internalift screw pump component replacements and repairs for lifting of liquids in municipal or industrial applications. Company experts provide equipment evaluations and recommend the best options to restore original pumping efficiency, extend useful life, avoid downtime and meet operating budgets. Turn-



Internalift screw pump component replacements and repairs from Evoqua Water Technologies

key services include removal or rehabilitation of existing equipment and installation of new equipment or components. **262/521-8442; www.evoqua.com.**



PUMP-MOTOR ALIGNMENT SOLUTION

The tab@lign tablet-based solution for pump-motor alignment from LUDECA combines PRÜFTECHNIK laser measurement technology with a tablet or smartphone device. The app runs on Apple and Android mobile devices and can be downloaded free from the Apple

Tab@lign for pump-motor alignment from LUDECA

App Store or Google Play. **305/591-8935; www.ludeca.com.**

EXPANSION JOINT

The 233-L and 234-L all-rubber high-lateral expansion joints from Proco Products operate at up to 145 psig (nominal size dependent) or up to 250 degrees F (elastomer dependent). They can be specified for numerous piping system requirements. They are constructed of various elastomers with rubber-impregnated polyester tire cord and a reinforcing ring at the top of the arch to provide stability in large lateral offset conditions. The four-arch design can offer up to 8 inches of lateral offset, providing savings when attaching to a pipe system next to water tanks and reservoirs. **800/344-3246; www.procoproducts.com.**



233-L and 234-L expansion joints from Proco Products

UNION FITTINGS



Dialectric union fittings from SIGMA Corporation

Dialectric union fittings from the SIGMA Corporation are designed for installation between pipes made from dissimilar metals, preventing corrosion from galvanic and stray current. Ranging from 1/2 to 2 inches, they have a female iron pipe thread to solder connection and are certified to UPC standards. The unions are compliant with the No Lead Plumbing Law. The insulator insert is made

from PSU 3010. The EPDM gasket is designed for standard temperature applications of up to 180 degrees F at 250 psi. **800/999-2550; www.sigmaco.com.**

GROOVED COUPLINGS

Advanced Groove System (AGS) couplings from Victaulic have a two-piece housing and a wedge-shaped groove that delivers pressure ratings up to 350 psi. A typical large-diameter joint that requires several hours to weld can be installed in less than an hour. The devices simplify installation by providing visual confirmation of proper assembly.



Advanced Groove System (AGS) couplings from Victaulic

Installation is complete when housing segments meet metal-to-metal and torque requirements have been met. The couplings create a union at every joint for easy access to the piping system for maintenance and system retrofits. Couplings are available for pipe up to 60 inches in diameter. **610/559-3300; www.victaulic.com.**



ACQ550 drive from ABB

Drives

VERSATILE DRIVE UNIT

The ACQ550 drive from ABB is available in ratings from 1 to 550 hp and seamlessly integrates as a NEMA 1, NEMA 12 or outdoor-rated NEMA 3R solution. A library of preprogrammed startup assistants

provide commissioning for submersible, centrifugal or positive-displacement pumps, and application macros simplify configuration of inputs, outputs and parameters. **800/752-0696; www.abb.com.**

NEMA 3R-RATED DRIVE

The VLT AQUA Drive from Danfoss VLT Drives is available in a NEMA/UL Type 3R rating, in addition to a NEMA/UL Type 4X enclosure. The new enclosure rating protects against rain, sleet and ice formation. With all cast aluminum parts, drives are inherently NEMA 3R, so there is no need for a separate enclosure. The range of standard I/O can be expanded through factory- or field-installable option cards. Each drive provides simple out-of-the-box operation. **800/432-6367; www.danfossdrives.com.**



VLT AQUA Drive from Danfoss VLT Drives

MEDIUM-VOLTAGE AC DRIVE

MV1000 medium-voltage AC drives from Yaskawa America combine compact modular design, high efficiency, low harmonics and high mean time between failures in a drive compatible with 1000 series low-voltage AC drive products. Smart



MV1000 medium-voltage AC drives from Yaskawa America

Harmonics reduces input total harmonic distortion (THD) to less than 2.5 percent without filters, exceeding the requirements of IEEE 519-1992 by almost 50 percent. They also provide galvanic isolation between power input and output. They use two 5-volt step bridges

per phase to generate a 17-level line-to-line voltage output delivered to the motor. The near sinusoidal waveform results in low THD voltage, low torque ripple and ideal low-speed torque without output filters. They are available in 2.4 kV models with outputs from 200 to 2,750 hp, and 4.16 kV models with outputs from 300 to 5,000 hp. **414/856-2496; www.yaskawa.com.**

Motor and Pump Controls

PADDLEWHEEL FLOW CONTROLLER

The Type 8032 intelligent paddlewheel switch with backlit display from Burkert Fluid Control Systems can be used in clear, neutral or aggressive liquids to switch a valve and to establish a monitoring system or an on/off control loop.



Type 8032 switch from Burkert Fluid Control Systems

The switching points can be programmed with the three-key keypad under the display, or from an external source over a 4-20 mA loop. The device comes standard with on/off output or with external setpoints and process value outputs. The remote-mount version has a transistor output only. The connection to the process in the piping is done with the quarter-turn technique of the inline fittings. **949/223-3100; www.burkert-usa.com.**



TCU pump controller from Data Flow Systems

SCADA-ENABLED PUMP CONTROLLER

The TCU pump controller from Data Flow Systems combines automated pump control functions with SCADA communications for fixed-speed and VFD applications. It is designed to automate up to three pumps or can be linked in series to accommodate any number of pumps. It

(continued)

has an intuitive operator interface and expandable I/O interface; no PLC knowledge is required. The HOA switches are fail-safe and remain functional even with loss of power. The unit is SCADA-ready with open Modbus RTU and ASCII protocols and is available with integrated radio, networking, auto-dialer or Verizon cellular communications. It comes with a backup battery and charger and configuration software. **321/259-5009; www.dataflowsys.com.**

VALVE CONTROLLER

The Hexacon Model III toxic gas multi-actuator valve controller from Halogen Valve Systems has an OLED information display and optional programmable relay interface module to provide clear, timely informational outputs. An optional second battery allows quick, reliable valve closures. A microprocessor system measures and applies a torque of 30 or 50 ft-lbs for test or emergency valve closures for cylinder and ton container valves. Fire codes recognize and approve the automatic-closing fail-safe shut-off valve system in place of a scrubber. The SCADA option system provides 26 information streams like activation status and error codes by actuator to allow quick corrective action. **877/476-4222; www.halogenvalve.com.**



Hexacon Model III valve controller from Halogen Valve Systems



TCOM SCADA control panels from Orenco Controls

MODULAR TELEMTRY CONTROL PANEL

TCOM SCADA modular telemetry control panels from Orenco Controls combine the functions of relays, timers and meters in a single device used to control booster stations, reservoirs and community wells. They can also be used as a SCADA patch, connecting peripheral equipment to an existing SCADA system. Panels include built-in communication protocols supported by most existing SCADA systems. They have color touch screens with built-in programming and real-time data acquisition and control over an Internet, cell or phone line connection. TCOM Viewer software is free and works on Windows PC computers, providing an easy-to-understand user interface along with remote access and control, plus the ability to retrieve, sort and graph data. **800/348-9843; www.orencocontrols.com.**

WIRELESS PUMP CONTROL PLATFORM

The Radioline wireless platform from Phoenix Contact offers wire replacement for simple I/O and serial communication. It has simple I/O-to-I/O communication without programming software. More advanced configurations, such as high-speed serial communication, network topologies up to 250 nodes, nonintrusive diagnostics and 128-bit AES encryption, can be accessed via the free programming software. It is available in two variants, 2.4 GHz and 900 MHz, allowing for applications to span distances from a few hundred feet to multiple miles. It is suited for simple wire replacement, pump control, sensing, flow and temperature monitoring, and PC/PLC/RTU interface applications. **800/322-3225; www.phoenixcontact.com.**



Radioline wireless platform from Phoenix Contact



PD6000 pump control/level monitor from Precision Digital Corporation

PUMP CONTROL/LEVEL MONITOR

The PD6000 pump control/level monitor from Precision Digital Corporation includes multi-pump alternation control to increase pump life by distributing loads. The unit has an informative, dual-line, six-digit display that can be customized to meet plant application needs. A 24 VDC power supply is available to power almost any level transmitter. The unit fits a standard 1/8 DIN panel cutout or can be field-mounted in a variety of enclosures. The NEMA 4X IP65 front keeps out water, dirt, dust and grime. MeterView Pro software is available free online and allows for easy programming and simple-to-configure monitoring and data logging. **800/343-1001; www.predig.com.**

EFFICIENT CONTROL STATION

ECO SMART STATION control systems from PRIMEX Controls provide a safe, energy-efficient solution for optimum pump control using the latest in VFD technology. The EnergyView Controller with kW Logix Software uses an Efficiency Auto-Tune algorithm that searches for the pump speed (Hz) that consumes the least energy per gallons of liquid pumped. The pump motor power is monitored by the VFDs and transmitted to the controller. No power meters are required. The auto-tune program accounts for the reduction in flow and head characteristics of the pump resulting from speed reductions to determine the best efficiency frequency (BEF). When the BEF is found, the pumps operate at that speed during every cycle. This ECO mode of operation is efficient during low and normal inflows to the pump station. **844/477-4639; www.primexcontrols.com.**



ECO SMART STATION control systems from PRIMEX Controls



Diaphragm pump from All-Flo Pump Company

Pumps

AIR DIAPHRAGM PUMP

The lubrication-free 1-inch air diaphragm pump from All-Flo Pump Company has a non-stall/freeze air system. Engineered for fluid and chemical compatibility, the bolted design offers ease of maintenance and leak-free operation. It is available in a variety of materials and options. A Max-Pass valve system allows operation under conditions from clean fluids to slurries to solids up to 3/4 inch. Pump sizes range from 1/4 to 3 inches. **440/354-1700; www.all-flo.com.**

PERISTALTIC METERING PUMP

The M-2 ProSeries-M peristaltic metering pump from Blue-White Industries offers several pump tube material options, providing treatment with a variety of aggressive and viscous chemicals. It delivers chemical with smooth, quiet, low-velocity pumping action and has an intelligent control system that permits connection to SCADA systems and other remote controllers. Optional SCADA communications command and status capabilities include start, stop, prime, setpoint speed, motor status and others. Available protocols include Profibus DPV1, Modbus RTU, Modbus-TCP, EtherNet/IP and Profinet RT I/O. A Tube Failure Detection system detects noncompatible fluid in the pump head, shutting down the pump and sending an alarm. It has feed rates from 0.01 to 15 gph, pressures to 125 psi and a 200-1 turndown ratio. It is NSF Listed Std.61. **714/893-8529; www.blue-white.com.**



M-2 ProSeries-M peristaltic metering pump from Blue-White Industries



Mobile rotary lobe pumps from Boerger

MOBILE ROTARY LOBE PUMP

Mobile rotary lobe self-priming, valveless, positive-displacement pumps from Boerger are used for rapid deployment of floodwater, stormwater, domestic wastewater, industrial effluents and biosolids, spills, and digester and lagoon clean up.

Twenty pump models in six series are offered with pulsation-free operation, fully reversible rotation, dry-run capabilities and flow rates to 5,000 gpm. All wear parts can be replaced through the front cover without removal of piping or drive systems. 612/435-7300; www.boerger.com.

DIAPHRAGM METERING PUMP

ProCam diaphragm metering pumps from Bran+Luebbe, An SPX Brand, are designed for applications such as pH control, flocculation and fluoridation. Available in five models with flow rates from 1.3 to 132 gph they are suitable for pressures up to 290 psi. They are hermetically closed pumps containing a mechanically operated PTFE double diaphragm that can be constantly monitored. Wet-



ProCam pumps from Bran+Luebbe, An SPX Brand

end material is 316SS or PVC standard. They can be configured with multiple heads linked together and driven by a single motor for chemical blending or dilution. Other options include automated flow control and electronic diaphragm condition monitoring. 800/252-5200; www.spxft.com.



25000 Series pump from Edson Pumps

DOUBLE DIAPHRAGM PUMP

The 25000 Series electric double diaphragm pump from Edson Pumps can create vacuum lift and discharge pressures comparable to small peristaltic systems. Components can be cleaned and replaced in minutes with virtually no tools. 508/995-9711; www.edsonpumps.com.

REPLACEMENT GRINDER PUMP

The Upgrade progressive cavity replacement grinder pump from Environment One Corporation is designed to fit nearly any other grinder pump wet well. It includes slide rails, pump/motor, float switches, piping and motor control devices. All solids are ground into fine particles that pass easily through the pump, check valves and small-diameter pipelines. The unit is designed not to jam and for minimum wear to the grinding mechanism. It comes with a self-contained level control system, eliminating float switches. It is automatically activated and runs for very short periods. The 1 1/4-inch slide face discharge connection is adaptable to any existing discharge piping. The internal check valve assembly is custom designed for non-clog, trouble-free operation. 518/579-3068; www.eone.com.



Upgrade pump from Environment One Corporation

WASTEWATER PUMPING SYSTEM

The Exporior wastewater pumping system from Flygt – a Xylem Brand, offers energy savings in a package that is easy to install and operate. Adaptive N-technology allows the impeller to move axially upward when necessary to permit bulky or tough debris to pass through, reducing stress on the shaft, seals and bearings. It is available with efficient motors optimized for wastewater pumping. SmartRun intelligent con-



Exporior wastewater pumping system from Flygt – a Xylem Brand

trols enable programming to optimize energy use. 704/409-9700; www.flygtus.com.

AIR SKIMMER

The Geysler Air Skimmer (GAS) from Geysler Pump Tech skims from a large surface area. Its pulse engine has an adjustable pulse rate to minimize waste scum flow and allow time for scum backfill. It has an adjustable suction level and pulse rate and can use an existing aeration blower for retrofit to existing clarifiers. It has no moving parts and is easily removed and disassembled for cleaning. 614/398-0960; www.geyser-pump.com.



ReliaSource lift station from Gorman-Rupp Company

ABOVE-GROUND LIFT STATION

The ReliaSource 8x9 above-ground lift station from Gorman-Rupp Company includes Gorman-Rupp pumps, controls and enclosures. It is fully assembled and rigorously tested to operating conditions. 419/755-1011; www.grpumps.com.

SEWAGE PUMP

The 3SD submersible, non-clog sewage pump from Goulds Water Technology – a xylem brand, combines dual hard-face mechanical seals with a 300-series stainless steel keyed shaft motor for defense against environmental conditions. It has a cast-iron, two-vane semi-open, non-clog impeller with pumpout vanes for mechanical seal protection. The pump is



3SD pump from Goulds Water Technology – a xylem brand

balanced for smooth operation, has a seal sensor probe and can run dry without damaging the inner compo-

nents. It comes in single- and three-phase options, with a range of 1.5 to 5 hp, supporting several hydraulic requirements. It is UL and CSA certified. 866/325-4210; www.goulds.com.

SUBMERSIBLE SHREDDER PUMP

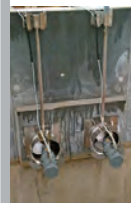
S4SHR and S4SHR-LP 4-inch hydraulic submersible shredder pumps from Hydra-Tech Pumps are designed to rip and shear solids with a 360-degree shredding action. The carbide tipped impeller and hardened macerator suction plate work together to produce a violent shredding action that keeps the discharge open. The S4SHR is suited for municipal, industrial, agricultural and institutional applications. The S4SHR-LP is narrower at 21.5 inches, allowing it to fit through most manholes. A guide rail assembly is available for stationary applications. Combined with HT15 to HT35 power units, the pumps are capable of flows up to 810 gpm. The variable-speed hydraulic drive can be used where electric power is hazardous or impractical. 570/645-3779; www.hydra-tech.com.



S4SHR and S4SHR-LP shredder pumps from Hydra-Tech Pumps

AXIAL-FLOW RECIRCULATION PUMP

The Model AXP axial-flow recirculation pump from Landia pumps large liquid quantities at low head. Designed with a sturdy planetary gear system for high efficiency, it pumps wastewater at low energy cost. With a propeller designed for efficiency the pump can be used to recycle activated sludge from



Model AXP axial-flow recirculation pump from Landia

(continued)

aeration zones into anoxic zones. It has a reliable triple-stage sealing system. Its propeller and volute insert are made of stainless steel. **919/466-0603; www.landiainc.com.**

DIAPHRAGM DOSING PUMP

The MEMDOS LP motor-driven diaphragm dosing pump from Lutz-JESCO America Corp. offers capacities to 270 gph and pressures to 232 psig. It uses a 115 VAC 60 Hz power supply and operates at greater than 90 percent motor efficiency. It includes dosing control and diaphragm rupture inputs, batch dosing with interval and timer functions, infinitely adjustable stroke frequency from 0 to 100 percent, and external control via standard signal 0/4-20 mA. It is available in PVC, PVDF, polypropylene and stainless steel construction and with an Ethernet interface. It can be outfitted with a double-diaphragm system. **800/554-2762; www.lutzjescoamerica.com.**



MEMDOS LP dosing pump from Lutz-JESCO America Corp.



General utility pumps from Moyno

GENERAL UTILITY PUMP

General utility pumps from Moyno suit water sampling and chemical applications. Design simplicity reduces maintenance and downtime. Accurate, repeatable, nonpulsating, low-shear flow handles multiple applications. The compact units (flows to 50 gpm and pressures to 600 psi) are offered in motorized and nonmotorized models. Packing or mechanical seals are available. **877/486-6966; www.moyno.com.**

REGENERATIVE TURBINE PUMP

Regenerative turbine pumps from MTH Pumps can reach pressures from 10 to 1,000 psi at low flow rates, making them well-suited for water sampling where samples from many locations need to be moved to one central location. Custom-sized for required pressure and flow to guarantee efficient performance, the pumps can distribute water hundreds of feet to testing sites throughout a treatment facility. They can also be used for pressure boosting, such as for spray/washdown, seal flushing and dust control. With the ability to handle 20 percent vapor by volume, they can generate micro-bubbles for dissolved air flotation processes. **630/552-4115; www.mthpumps.com.**



Regenerative turbine pumps from MTH Pumps

MECHANICAL METERING PUMP

The 7000 Series mechanical metering pumps from Neptune Chemical Pump Company are designed for dosing of alum and ferric chloride in treatment applications. The self-priming, mechanically actuated pumps eliminate contour plates on the liquid side of the diaphragm, resulting in a simple, straight-through valve and head design that allows improved flow characteristics. They handle clear liquids with viscosities from water-like to 5,000 cPs. The capacity is manually adjustable via micrometer dial while the pump is running, allowing the pump to produce flows from 10 to 450 gph at head pressures up to 150 psi. The liquid ends are constructed of PVC. Explosion-proof, variable-frequency drive and wash-down duty motor options are available. **215/699-8700; www.neptune1.com.**



7000 Series metering pumps from Neptune Chemical Pump Company

SLUDGE CAKE CONVEYING SYSTEM

NEMOBF/SF positive displacement pumps from NETZSCH Pumps North America convey dewatered sludge from filter presses or centrifuges. The customizable rectangular hopper and force-feed chamber provide direct entry into the rotor and stator. The coupling rod incorporates a positioned feed screw auger that extends over the joints and is always positioned opposite the open cavity of the stator. This gives sludge cake the shortest possible route into the open cavity, improving chamber filling. The Friction Loss Reduction System achieves considerable pressure reduction, lowering operating costs and improving service life. A ring nozzle delivers a continuous, even, 360-degree layer of water or polymer within the pipeline for friction loss reduction and pressure reductions up to 50 percent. **610/363-8010; www.netzschusa.com.**



NEMOBF/SF positive displacement pumps from NETZSCH Pumps North America

POSITIVE DISPLACEMENT PUMP



Double Disc positive displacement pump from Penn Valley Pump Co.

The Double Disc positive displacement pump from Penn Valley Pump Co. eliminates high maintenance costs with a Maintain-in-Place hinged housing that allows servicing without disturbing piping. It eliminates packing glands and mechanical seals, providing clean, leak-free installation. It does not rely on close tolerances to generate flow and so offers an extremely low wear rate. It can run dry without damage and is routinely used for sludge-handling applications, including dewatering feed, thickened sludge, digested

sludge, primary sludge, scum, septage and lime slurry. It is self-priming, with flow rates from 1 to 1,300 gpm and handles up to 2-inch solids and line-size semi-solids. **215/343-8750; www.pennvalleypump.com.**

ELECTRIC ACTUATOR

CMA Series electric modulating actuators from Rotork Instruments are sized for linear, quarter-turn and rotary control valve and pump applications requiring precise position control and continuous modulation. They are powered by single-phase or direct-current supplies, eliminating air hoses and compressors. Setup and configuration is easy via push buttons and an internal six-segment LCD display. Resolution is 0.25 percent on linear and quarter-turn applications and 2 degrees on the multi-turn configuration. The devices have permanently lubricated and maintenance-free drive trains, 4-20 mA loop-powered feedback signals, and digital communication options including HART, Foundation Fieldbus, Profibus, Paksan, RIRO and Modbus. **336/659-3493; www.rotork.com.**



CMA Series electric modulating actuators from Rotork Instruments

VERTICAL TURBINE PUMP

VTP (Vertical Turbine) pumps from Ruhrpumpen operate in wells or sumps. The bowl assembly consists of a suction case or bell, one or more pump bowls, and a discharge case. It has API 610 latest edition construction (VS1 type), oversized bowl shaft sizing, and collet-mounted impellers, with a capacity of up to 60,000 gpm, head up to 2,500 feet, and a maximum pressure of 1,080 psi. **918/627-8400; www.ruhrpumpen.com.**



VTP (Vertical Turbine) pumps from Ruhrpumpen

TUBE-MOUNTED SCREW PUMP

The self-contained Archimedian Tube-Mounted Screw Pump (TMSP) from Schreiber turns inside a stationary support tube, allowing it to transport return activated sludge at low rpm, eliminating floc shearing. It can be set at a fixed angle, or the lower end can be hoist-



Archimedian Tube-Mounted Screw Pump (TMSP) from Schreiber

supported, allowing the pump angle to be varied. The variable pumping capacity, which can be modulated even at constant speed by adjusting the pump angle, eliminates variable-frequency drives. The optional hoist facilitates access for maintenance. The self-aligning lower support bearing is a single-row, spherical roller bearing designed for radial and thrust forces. The lower bearing lubrication system uses a transparent oil reservoir and a gravity supply tube that eliminates a grease and recovery system. 205/655-7466; www.schreiberwater.com.

CAKE PUMP SYSTEM



Cake transfer system from seepex

The piping-contained cake transfer system from seepex replaces the open-air cake transfer method using conveyors. The pitch, diameter and speed of the auger that pushes the cake into the pumping element can be adjusted to match the application, while load cells automate the process. The hopper is fitted with sensors that detect the increase in weight and adjust the speed accordingly, saving energy. The system is also fitted with a pressure sensor, dry-running protection sensor and a boundary layer injection

system. An engineered control panel ensures properly functioning components. 877/806-4152; www.seepex.com.

PERISTALTIC PUMP

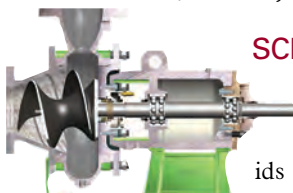
Masterflex peristaltic pumps from Thermo Scientific eliminate the risk of vapor lock, as the chemicals being pumped are confined to elastomer tubing and never contact the pump itself. They deliver optimal chemical resistance to high-strength chemical oxidants like sodium hypochlorite, aggressive materials like ferric chloride, polymers and other shear-sensitive products, and highly viscous and abrasive materials like lime slurries. Rollers on the pump head rotor squeeze the tubing, generating vacuum that propels the solution through the tube at a specified rate. Scale does not build up in the pump because there are no valves or seats exposed to the fluid stream. The pumps offer simple operation and a large practical turndown and capacity range with one variable, single-speed adjustment. When the pump stops, the occluded portion of the tube stays squeezed shut with no siphoning effect.



Masterflex peristaltic pumps from Thermo Scientific

800/637-3739; www.thermoscientific.com.

SCREW CENTRIFUGAL PUMP



Triton screw centrifugal pumps from Vaughan Company

Triton screw centrifugal pumps from Vaughan Company handle thick biosolids, large or stringy solids, shear-sensitive fluids and delicate or highly abrasive materials.

They offer steep performance curves, non-overloading power characteristics, heavy-duty power frames and a flushless mechanical seal. A water-flushed mechanical seal or packing is available. 888/249-2467; www.chopperpumps.com.

HORIZONTAL-END SUCTION PUMP

The 1600 vortex close-coupled horizontal-end suction pump from Vertiflo Pump Co. has back pullout construction, a fully recessed vortex impeller and an external impeller adjustment. It has capacities up to 1,600 gpm and 170 feet TDH and can operate in temperatures up to 250 degrees F. It is available in cast iron, 316 stainless steel fitted, all 316 stainless steel, Alloy 20 and CD4MCu. 513/530-0888; www.vertiflopump.com.



1600 suction pump from Vertiflo Pump Co.

Valves



AirPro Max air valves from Henry Pratt Company

AIR VALVE

AirPro Max air valves from Henry Pratt Company have a body shape that fits a smaller valve vault. Their float/linkage design is suitable for higher pressures.

The design prevents seat leakage and float mechanism failures and has close-tolerance machined parts, stainless trim, and standard hoods or threaded caps. The valves have a large orifice to break vacuum, or a small orifice for air release under pressure. Both can be combined to allow maximum pumping efficiency and protection from pipeline damage due to vacuum-induced collapse or surge-induced breaks. 877/436-7977; www.henrypratt.com. tpo

Every day is Earth Day.™



"These guys care about what they're doing. They notice if there's even a slight movement in our effluent quality. They do a great job, and everybody pitches in. They all know what they have to do, and it's done correctly."

Jim Listwan

An Original Environmentalist

CHIEF OPERATOR
Salt Creek Sanitary District Wastewater Treatment Plant, Villa Park, Ill.

Get your **free subscription** and read about original environmentalists like Jim each month in *Treatment Plant Operator*.

COLE PUBLISHING INC. / www.tpomag.com
Proudly Serving the Environmental Service Industry Since 1979

Blowers decrease energy consumption and reduce noise, heat and maintenance costs

Problem

King County, Wash., wanted more energy efficiency in upgrading the aeration blowers at the South Plant in Renton. With the support of Puget Sound Energy and the Washington State Public Works Board, the plant secured incentives and a low-interest loan towards the retrofit. The county also needed to improve the working conditions for plant staff, increase operational reliability and reduce scheduled maintenance expenses.

Solution

The county replaced its blowers with **APG-Neuros turbo blowers**. The retrofit aligned with ongoing strategic efforts to protect water quality and decrease energy consumption in all county facilities by 20 percent by 2020.

RESULT

The county estimates the two new blowers will save \$55,000 in annual energy costs and reduce the plant's energy consumption by 782,268 kWh per year. **866/592-9482; www.apg-neuros.com.**

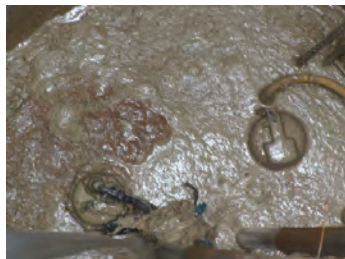
Shredder pumps eliminate sump problems

Problem

A large meat processing plant in Michigan had continual problems with its non-clog submersible pumps installed in the main lift station that pumped from the factory's wastewater pretreatment plant to the city's force main sewer. Continual blockages made it necessary to have the pumps pulled at least once a week to be cleared, cleaned and reset. The added maintenance cost more than \$20,000 annually.

Solution

Kerr Pump and Supply replaced the existing pump with two **SK Series shredder pumps and rail systems** from **BJM Pumps**. The units shred solids before passing the liquid, leaving solids slightly larger than if passed through a grinder pump. The retrofit used the existing control panel and upgraded the motor starters to handle the 15 hp motors.



RESULT

After 16 months in service, savings totaled over \$22,400. Kerr has since replaced more non-clog pumps in the wastewater treatment plant with BJM shredder pumps. **877/256-7867; www.bjmpumps.com.**

Solids-handling pump reduces grease and eliminates odor and clogs

Problem

The wet-well duplex station at WK North Medical Center in Shreveport, La., transfers kitchen and basement wastewater into a city manhole about 300 feet away. The station was outfitted with two 7.5 hp submersible

pumps. The medical center's maintenance engineering supervisor, Marty Cole, noticed odor and was experiencing two or more clogs in the station every six to eight months due to heavy grease buildup.

Solution

Crane Pumps & Systems distributor, Delta Process Equipment, installed two **4SHM Barnes Solids Handling Series pumps** rated 400 gpm at 25 feet TDH in the 72- by 228-inch fiberglass wet-well duplex station with all stainless steel piping and lift chains. The Monovane impellers provide clog resistance on applications with lower discharge heads where the concentration of velocity in the single passage effectively passes solids.



RESULT

The pumps have not clogged since their August 2010 installation. Cole reports no odor, much less grease and no clogs. **937/778-8947; www.cranepumps.com.**

Valveless piston pump cures priming issues for methanol metering

Problem

A suburban college wastewater treatment plant in New York was looking for a cost-effective method to remove nitrate from wastewater effluent. The denitrification process required the addition of methanol. Diaphragm pumps were originally installed, but at the low flow rates required for methanol addition, check valves became air-bound, causing the pumps to lose prime. The challenge was to find a metering pump to accurately add low volumes of methanol.

Solution

The **QDX Valveless Ceramic Piston Pump** from **Fluid Metering** was installed. The CeramPump technology relies on only one moving part, a rotating and reciprocation ceramic piston, to accomplish pumping and valving functions, eliminating check valves. For metering methanol, the pump head is close-coupled to a QDX hazardous-duty drive.



RESULT

The pump eliminated low-flow priming issues and self-primed even between long periods of downtime. Sapphire-hard ceramic internals are chemically inert and wear resistant for long-term drift-free accuracy, eliminating downtime and recalibration. **800/223-3388; www.fmipump.com.**

Mortar pump assists in quick resurface of lift station

Problem

Commonwealth Epoxy Coatings of Newport News, Va., received the contract to resurface a wastewater transfer station for a regional water and

Below the surface

of water treatment

LOW NOISE

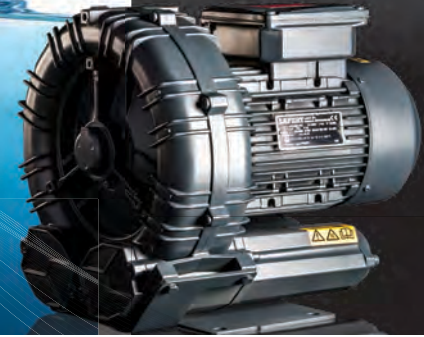
RELIABILITY

3-YEAR WARRANTY

QUALITY

NO MAINTENANCE

Saukville, WI - Phone: 262-268-0180 - usa@fpz.com - www.fpz.com



GET
EMAIL NEWS
ALERTS FOR
TREATMENT PLANT OPERATOR
tpo

Go to tpomag.com/alerts and get started today!

sewer authority in North Carolina. The specifications called for two cementitious materials of different viscosities. Commonwealth had never before sprayed the heavier of the two materials and recognized that its existing equipment could not handle it. Hand-troweling the materials would double the timeline.

Solution

The company chose the **M680 Mortar Pump** from **Graco**. It handles materials of varying viscosities at low pressures (typically 200 to 500 psi). It is easy to use, enabling Commonwealth to begin spraying quickly. The spray provided thickness control, producing a consistent layer of material.



RESULT

According to Commonwealth Vice President Jeff White, the Graco M680 cut project time in half and reduced costs by one-third. 877/844-7226; www.graco.com.

Pump system used to move effluent with high solids content

Problem

The 420 mgd (design) Village Creek Wastewater Treatment Plant in Fort Worth, Texas faced the challenge of moving biosolids at 27 to 29 percent solids through a pipe that went up 30 feet, making a 90-degree turn and traveling 150 feet.

Solution

Operators installed a **KSP50V(HD)L pump** from **SchwingBioset**. A 10-foot-tall, 940-cubic-foot sliding frame silo was used for storage, and live-bottom hoppers were used to load trucks for the land application program.



RESULT

The plant beneficially reuses 500,000 pounds of biosolids per week. Rather than going to a landfill, the Class A material is hauled to a strip mine for site reclamation. 715/247-3433; www.schwingbioset.com.

SRD valve helps eliminate cavitation

Problem

Pittsfield Township, Mich., was experiencing pressure drops from 70 to 7 psi due to 16-foot fluctuations in tank elevation caused by varied water levels. Consequently there was cavitation in the valve that had already destroyed two reducers, and the plug valve was not able to modulate the rate of flow into the tank.

Solution

Operators chose the **Single Rolling Diaphragm (SRD)** with anti-cav trim from **Singer Valve** to eliminate cavitation damage without sacrificing other valves and changing processes or system dynamics. It allows

the valve to operate steadily at high and low flows due to its vertical diaphragm, which rolls while opening and closing, enabling it to lock the valve in place without any friction. The dual-cage anti-cav was custom engineered to match the drop ratio and manage maximum flow, while creating enough backpressure in the cage to prevent the microscopic vapor bubbles from escaping and causing the damage.



RESULT

The control valve with anti-cavitation trim operates quietly and smoothly without cavitation and with minimal maintenance. 704/391-5785; www.singervalve.com.

Resort town wipes out pump clog problems

Problem

Consumer flushables were causing regular pump clogs in the year-round resort community of Big Bear City, Calif. “Nine times out of 10, when we pulled a pump it would be clogged with rags,” says Andy Keller, sewer department foreman. The most problematic of the seven underground pump stations he operates was clogging as often as three to four times a week. Pump clogs often came one right after another, and because many were on weekends crowded with tourists, service workers were paid overtime.

Solution

After consulting with a representative from **Smith & Loveless**, the city purchased **X-PELLER impellers** for three problematic stations. The mono-port design helps counterbalance hydraulic forces and create a balanced, single flow path that passes 3-inch solids and problem flushables.

RESULT

Pump clogs have been nearly eliminated, according to Keller. Operation costs are down overall. Maintenance workers are freed up to work on other equipment, and they are safer with no more trips to the confined spaces of underground stations. 800/898-9122; www.smithandloveless.com.

Treatment plant upgrades require 100 mgd bypass

Problem

The Blue River Waste Water Treatment Plant in Kansas City, Mo., faced an upgrade that required old piping to be tied into new piping. The pipes ranged from 60 to 96 inches.

Solution

Thompson Pump and Manufacturing Co. bypassed up to 100 mgd, the dry weather peak flow of the plant, using twelve 18-inch primary jet pumps, including two **18JSCK pumps** and 10 **18JSCJ pumps**. Also used were one 18-inch standby pump, one 18-inch wet-weather storm ditch pump, and four 8-inch pumps for pumping down the water remaining in the 96-inch line. All of the 18-inch pumps used 18-inch suction pipe. The project used a total of about 5,000 feet of 18-inch discharge pipe.



RESULT

The project went as expected, and the pipework was completed as scheduled. 386/767-7310; www.thompsonpump.com.

Prerotation pumping system attacks lift station clogs

Problem

The Allen Road Lift Station in Bakersfield, Calif., faced two problems — pumps that clogged and dirty wet wells full of floating and settled solids that caused an unpleasant odor. Maintenance personnel had to travel to the lift station to manually clean out the pumps, and a vacuum truck had to be hired regularly to remove the solids.

Solution

The city selected a **WEMCO-Hidrostral Prerotation pumping system**, manufactured by **Weir Specialty Pumps**. It incorporates a pre-rotation basin designed to skim floatables from the top of the wet well and scour settled solids each time the pump runs through a pumping cycle. Simultaneously, it reduces clogging with a single-vane impeller.



RESULT

The systems were installed in 2007 and have experienced no clogged pumps to date. Floating and settled solids have been reduced, and vacuum truck visits have been reduced by more than 75 percent. 801/359-8731; www.weirsp.com. **tpo**

TREATMENT PLANT OPERATOR

tpo

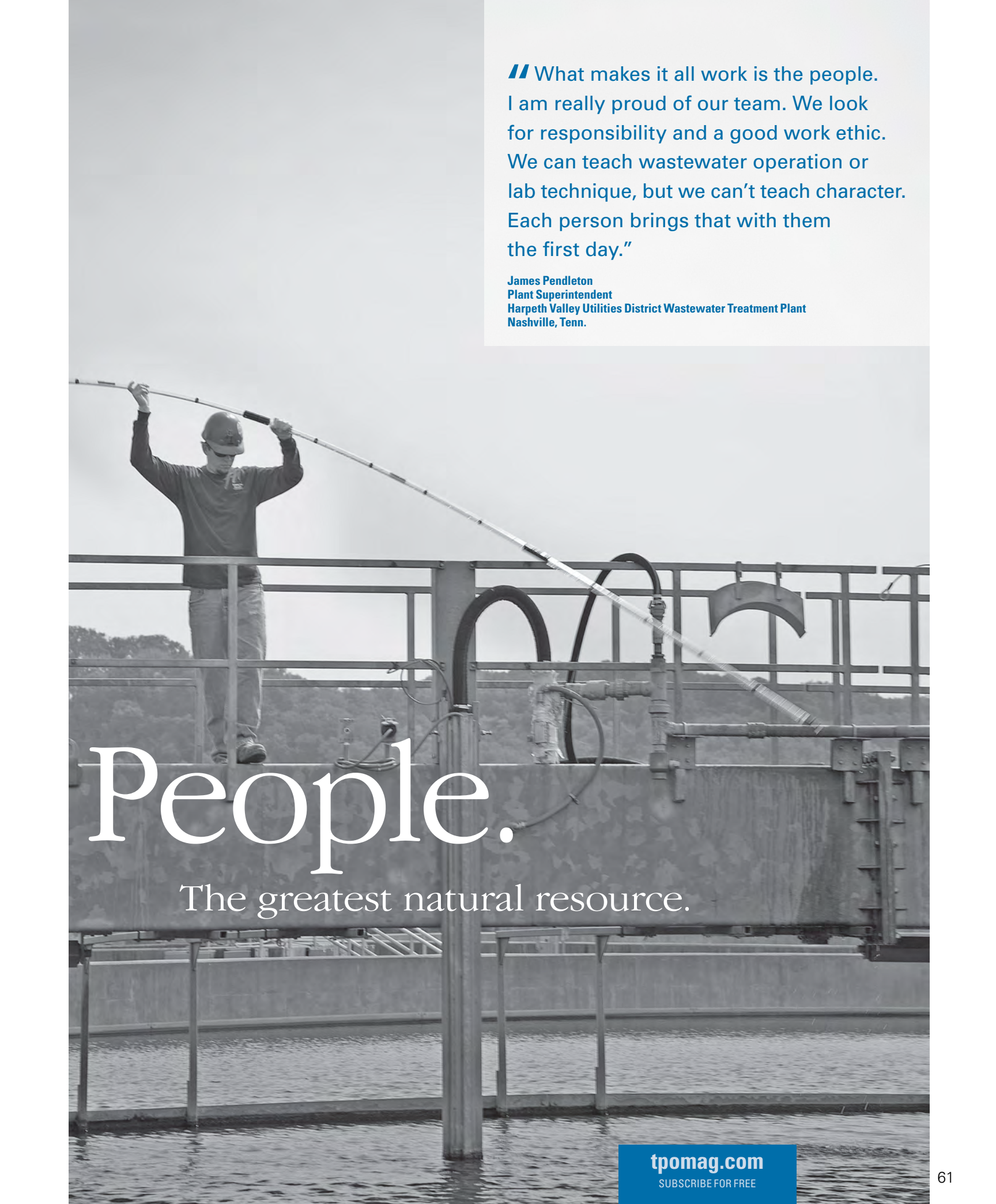
It's your magazine.
Tell your story.

TPO welcomes news about your wastewater or water treatment operation for future articles.

Send your ideas to editor@tpomag.com

Dedicated to Wastewater & Water Treatment Professionals

FREE subscription to Treatment Plant Operator at: **tpomag.com**



// What makes it all work is the people. I am really proud of our team. We look for responsibility and a good work ethic. We can teach wastewater operation or lab technique, but we can't teach character. Each person brings that with them the first day."

James Pendleton
Plant Superintendent
Harpeh Valley Utilities District Wastewater Treatment Plant
Nashville, Tenn.

People.

The greatest natural resource.

tpomag.com
SUBSCRIBE FOR FREE



1. SPIRE ULTRASONIC WATER METER

The Prime Series 280W – CI ultrasonic water meter from Spire Metering Technology is designed for durability, wide dynamic range (2 to 10 inches) and leakage detection. Features include multi-path technology, no moving parts, bidirectional flow and is AMR/AMI ready with pulse, M-Bus, Modbus, BACnet or wireless interface. **888/738-0188; www.spiremt.com.**

2. SURCOTECH ODOR COUNTERACTANT

Scatter granular odor counteractant from SurcoTech is formulated to handle odors from restaurant, institutional, commercial and municipal waste. Containing the odor destroying additive Metazene, the granules are biodegradable, noncorrosive and contain no acids. **800/556-0111; www.surcotech.com.**

3. ENDRESS+HAUSER FMR5X LEVEL TRANSMITTERS

The Micropilot FMR5X series of free space radar level transmitters from Endress+Hauser features software with multi-echo tracking algorithms and functions to suppress echoes for 0.078 inch accuracy. Designed for the level measurement of liquids and bulk solids, liquids can be measured in metal or plastic tanks, stilling wells, bypass chambers or other vessels up to 131 feet high with standard units or 197 feet with the enhanced dynamics option. **888/363-7377; www.us.endress.com.**

4. DAKOTA INSTRUMENTS ACRYLIC FLOWMETERS

The 6A03 line of acrylic flowmeters from Dakota Instruments have interchangeable direct reading scales for air, water, argon, oxygen, carbon dioxide, nitrogen, helium and hydrogen. Dual scales display flow rates in metric and English units. Optional scales can be developed for diverse flow conditions. **800/879-7713; www.dakotainstruments.com.**



5. LARSON ELECTRONICS EXPLOSION-PROOF DROP LIGHT

The FTL-5-LED-ILC-50 explosion-proof LED drop light from Larson Electronics has an LEDt8-28W-Vi T8 bulb that produces 2,750 lumens of light and requires no ballast to operate. The lightly frosted lens diffuses the light, while the aluminum housing serves as a heat sink and provides rigidity and strength. The light runs directly off any voltage rating from 100 to 277 volts and comes with 50 feet of cable. **800/369-6671; www.magnalight.com.**

6. VANAIR ROTARY SCREW AIR COMPRESSOR

The Viper diesel 80 cfm at 100 psi rotary screw air compressor from Vanair Manufacturing is designed to operate 90-pound jackhammers, as well as 1 1/2-inch impact wrenches and piercing tools. Features include automatic variable throttle control to minimize fuel consumption, 48 cfm at idle, auto engine-off and restart based on air demand, Tier 4 certified Kubota engine and access to air power and restart based on air demand. **800/526-8817; www.vanair.com.**

7. SODIMATE CUSTOM-FABRICATED SLURRY TANKS

Custom-fabricated slurry tanks from Sodimate include mixer, waterboard (with solenoid valves and flowmeters), level control systems and needed connections for slurry pumping and draining. Tanks are made from high-density polyethylene (HDPE), stainless steel or fiberglass with volumes ranging from 130 to 750 gallons. The dust-free tanks are designed to hold dry hydrated lime, powdered activated carbon (PAC) and polymers. **773/665-8800; www.sodimate-inc.com. tpo**

product spotlight



Chlorine analyzer reduces reagent consumption

By Ed Wodalski

The **Orion Chlorine XP** online process analyzer from **Thermo Fisher Scientific** uses colorimetric DPD chemistry to continuously measure total and free chlorine. Designed for low cost of ownership, extended reagent use and increased accuracy, the analyzer combines multiple measurements in one unit.

“You can have free chlorine only, total chlorine only, free and total chlorine with pH and free and total chlorine without pH,” says Manav Randhawa, product marketing manager for Thermo Fisher Scientific. The analyzer also can measure routine water-quality parameters.

“One of the key things this product has is the ability to achieve a minimum detection limit of 10 ppb consistently,” he says. Greater sample accuracy also helps extend reagent use from 30 days up to two months at five-minute cycle times.

“As a wastewater operator, most wastewater plants add chlorine to make sure the water is disinfected before it is released,” Randhawa says. “The analyzer determines how much chlorine should be added. And once the chlorine is added, the range of the analyzer allows the operators to monitor the amount of chlorine that they add and test how much chlorine is in the water before it is released.”

Water enters the analyzer, which self-zeroes before each sample, and flows through a filtering chamber, removing some of the residue. Sample conditioning is not required. From there it enters the reaction chamber, triggering the reagent pumps. The pumps only trigger when a sample enters the chamber. Using the DPD method, a color reaction, ranging from clear to red, takes place. The darker the color, the more free chlorine is present. Color intensity is converted to ppm using the Beer-Lambert law. An up-and-down movement mixes the sample, making it more homogenized for greater accuracy.

The analyzer’s self-adjusting light source, hands-free, self-cleaning photocell and elimination of bubbling in the photocell help reduce maintenance.

“Every year we recommend changing the peristaltic pumps, filters and tubing to the filters and pumps,” Randhawa says. “That’s pretty much the only maintenance, other than changing the reagents.” A maintenance kit is available.

The 24-pound analyzer is 26 inches wide by 13 inches high and 5.5 inches deep. Password protected, it has an IP-65 rated enclosure (NEMA 4 equivalent) and 5.5-inch LCD graphic display with background light alarms and status. **978/232-6000; www.thermoscientific.com/processwater.**

industry news



Val-Matic completes research facility

Val-Matic completed construction of its 7,000-square-foot research and development facility in Addison, Ill. The plant includes a materials lab for testing elastomers and metals and flow lab for performing check valve and water flow tests. The facility also includes room for hands-on training.

Toshiba International realigns motors and drives division

Toshiba International Corp. realigned its motors and adjustable drives into one division. The new structure includes R&D, manufacturing, sales, field services and training. The service integration enables TIC to test its motors and ASDs as a complete system.

WesTech launches equipment website

WesTech Engineering launched an equipment website (www.westech-inc.com) for water and wastewater processing. The site includes video, case studies, white papers and flow diagrams.



Evoqua board names interim CEO, CFO

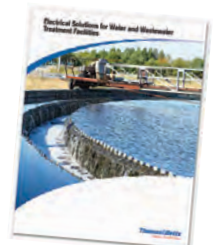
The Evoqua Water Technologies Board of Directors named Gary Cappeline interim chief executive officer and Mark Roos interim chief financial officer.

Chemineer launches Express service program

Express Service Center from Chemineer includes 48-hour equipment analysis, parts replacement and repair service. The program is available for Chemineer HT and HS agitators, model 20, MR and GT agitators, mechanical seal cartridges, impeller hubs, blades and bearing assemblies.

Thomas & Betts offers water, wastewater brochure

The Thomas & Betts brochure, *Electric Solutions for Water and Wastewater Treatment Facilities*, includes corrosion resistance, power quality, efficiency and reliability. The brochure is available at www.tnb.com. **tpo**



40,000+
municipal and utility maintenance
professionals read it every month.
Do you?

MUNICIPAL
**SEWER
&
WATER**

A subscription is **FREE**.
Visit mswmag.com

people/awards

The **Wolf Treatment Plant** (Shawano, Wis.) received the 2014 Registered Laboratory of the Year Award from the Wisconsin Department of Natural Resources. The annual award recognizes laboratories for their outstanding commitment to producing high-quality data.

Hydro Recovery LP, a provider of wastewater treatment and management services to the natural gas industry, received the 2013 Water Management Company of the Year Award from the Northeast Oil & Gas organization.

The New York City-based team of **Hazen and Sawyer and Montgomery Watson Harza** earned a National Recognition Award from the American Council of Engineering Companies in the 48th annual Engineering Excellence Awards for assisting the city Department of Environmental Protection with its Advanced Wastewater Treatment Program.

Warren Howard was named utilities operations manager for the City of Marinette, Wis.

The **Tiverton (Mass.) Wastewater Department** received the Innovation Award from the Atlantic States Rural Water and Wastewater Association.

Harry Butland Jr., chief operator of the Marlborough (Mass.) Westerly Wastewater Treatment Plant, received a 2013 U.S. EPA Regional Wastewater Treatment Plant Operator Excellence Award for excellence in operations and maintenance.

The **New Kent County (Va.) Public Utilities Parham Landing Wastewater Treatment Plant** won the Plant Performance Award for the third consecutive year from Aqua-Aerobic Systems.

TPO welcomes your contribution to this listing. To recognize members of your team, please send notices of new hires, promotions, service milestones, certifications or achievements to editor@tpomag.com.

education

Indiana

TREEO Center at the University of Florida in Gainesville offers these courses:

- July 8-11 – Wastewater Class C Certification Review
 - July 22-23 – Water Reclamation & Treatment Processes
 - July 29-31 – Activated Sludge Process Control and Troubleshooting
 - August 4 – Basic Water and Wastewater Pump Maintenance
- Visit <http://www.treeo.ufl.edu/wastewater-courses.aspx>.

Indiana

The Alliance of Indiana Rural Water is offering these courses:

- July 10 – Lift Station Troubleshooting and Pump Service, Warsaw
 - July 17 – Financial Impact of Phosphorus Removal, Knox
 - Aug. 28 – Financial Impact of Phosphorus Removal, Roachdale
 - Oct. 21 – GIS Mapping, Scottsburg
 - Oct. 29 – Lift Station Troubleshooting and Pump Service, Indianapolis
 - Nov. 6 – GIS Mapping, Cloverdale
- Visit www.inh2o.org.

events

July 20-22

Alabama Water and Pollution Control Association (AWPCA) Annual Short Course and Conference, Mobile. Visit www.awpca.net.

Aug. 26-29

Ohio Water Environment Association and AWWA Joint Conference, Hilton Columbus Downtown. Visit www.ohiowea.org.

Aug. 27-28

Water Environment Association of Texas Laboratory Topics Biennial Conference and Expo, Dallas/Allen. Visit www.weat.org.

Sept. 8-11

WaterJAM, joint conference with the Virginia Water Environment Association and the Virginia Section AWWA, Hampton. Call 804/332-5286 or visit www.vwea.org.

Sept. 27-Oct. 1

Water Environment Federation WEFTEC Conference, Morial Convention Center, New Orleans. Visit www.weftec.org.

Kansas

The Kansas Water Environment Association is offering these courses in Dodge City:

- July 2 – An Examination of Your Safety
 - July 8 – An Examination of Your Ethics
 - July 10 – Introduction to Water and Wastewater Conveyance
 - July 15 – Natural Systems for Wastewater Treatment
 - July 31 – Wastewater Stabilization Lagoons
- Visit www.kwea.net.

Michigan

The Michigan Water Environment Association is offering these following courses in East Lansing:

- Sept. 11 – Collections Seminar
 - Oct. 29 – Health and Safety Seminar
 - Nov. 5 – Process Seminar
- Visit www.mi-wea.org.

Nebraska

The Nebraska Water Environment Association is offering these courses:

- July 17 – Wastewater Training, Kearney
 - Oct. 6 – Wastewater Training, Lincoln
- Visit www.ne-wea.org.

New York

The New York Water Environment Association is offering these courses:

- June 17 – Occupational Chemical Exposure, Hopewell Junction
 - July 17 – Occupational Chemical Exposure, Lockport
 - Oct. 23 – Solids Handling and Dewatering, Babylon
 - Oct. 29 – Solids Handling and Dewatering, Bath
- Visit www.nywea.org.

Virginia

The Virginia Water Environment Association is offering a Lab Practices Conference on July 28-29 in Charlottesville. Call 804/332-5286 or visit www.vwea.org.

Wisconsin

The University of Wisconsin Department of Engineering-Professional Development is offering these courses in Madison:

- Oct. 28-30 – Wastewater Treatment Processes and Technologies
 - Dec. 3-5 – Sanitary Sewer and Collection System Engineering
- Visit <http://epdweb.engr.wisc.edu>.

The Wisconsin Department of Natural Resources is offering these courses:

- July 23 – Bloodborne Pathogens/Hazard Communications/Lockout-Tagout, Plover
 - July 24 – Northwoods Collection System Seminar, Marshfield
 - Aug. 5-7 – Fundamentals of Modern Wastewater Treatment Process, Milwaukee
 - Sept. 16 – Confined-Space Entry, Wauwatosa
- Visit <http://dnr.wi.gov>. **tpo**

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



*inspiring,
stimulating,
motivating*

Savored by wastewater and water treatment professionals.

Get your fill for free. Subscribe at www.tpomag.com



Keeping it GREEN since 1979

www.colepublishing.com

TREATMENT PLANT OPERATOR tpo Marketplace Advertising




wwett
Water & Wastewater Equipment,
Treatment & Transport Show

FEBRUARY 23-26
INDIANA CONVENTION CENTER
INDIANAPOLIS

2015

www.wwett.com

Rebuilds Parts



Belts



K-S Komline-Sanderson

1 800 225 5457
www.komline.com

TREATMENT PLANT OPERATOR tpo JULY

CLASSIFIED ADVERTISING

DEWATERING

New half-meter ALRick belt filter press with stainless steel frame. \$30,000 fob. Johnstown, NY. One-year warranty and start-up services included. alrickpress@yahoo.com 518-772-4590 (o07)

Septic Receiving Screens: Dual-screen design, affordable, high capacity. Two models: One sits over any open pit and the all new stand-alone unit - use it anywhere. 208-790-8770. screencosys@gmail.com www.screencosystems.com (P07)

2007 NT-4000E trailer-mounted dewatering system with diesel-powered pump dosing plant. Portable unit. Asking \$60,000. Call 301-502-1606. (P07)

EDUCATION

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

POSITIONS AVAILABLE

East Coast Sales and Product Consultant: CCTV pipe inspection equipment manufacturer accepting applications for experienced underground infrastructure rehabilitation sales and product consultant. The position entails direct technical selling of sewer, water and well rehabilitation products to municipal water and waste water utilities, industrial clients, consulting engineers and contractors. Maximum 30% out of office travel is required. Skills/Experience required is 5 years technical sales experience in related field or 2 years experience and college degree. Public speaking in the form of product presentations and field demonstrations. Candidate will represent product at trade shows and conferences. Must be able to lift 70 lbs. Valid, insurable drivers license and passport required for occasional international travel. Base salary plus commission. Criminal background check required. Drug free, equal opportunity employer. Submit resume and references to reusa@rauschusa.com (C07)



It's black and white.

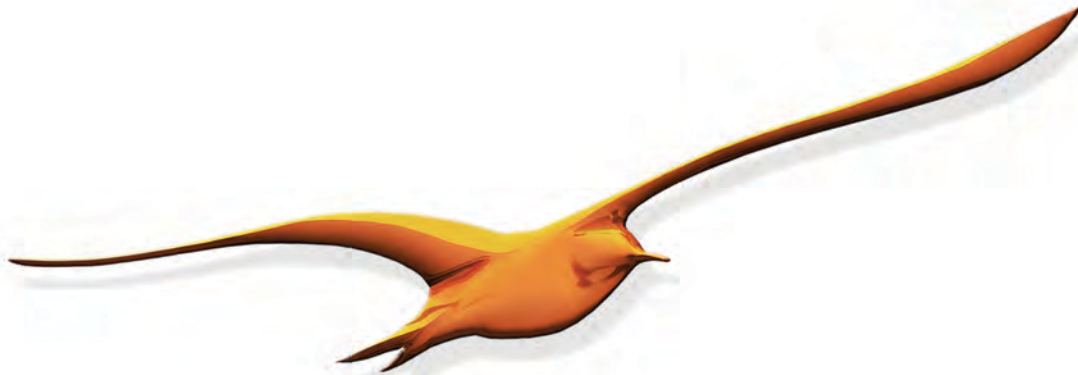
In every issue of *Municipal Sewer & Water*, you'll read all about sanitary sewer, stormwater and water system professionals. You'll discover:

- Who are the innovators in system repair and maintenance
- How they make sound decisions that improve service and save money
- What tools and technologies drive efficiency and performance
- Where to go to find the latest equipment and advice

No gray area here.

Municipal Sewer & Water has it all. And it's **FREE**.

Start your subscription today at mswmag.com
or call 800-257-7222.



SUBMERSIBLE LEVEL TRANSMITTERS

Keller America submersible level transmitters provide the best price, performance, and value for your application.

Each one is built to order in the U.S. with a short, 3-day lead time and several models include guaranteed lightning protection at no additional cost.

For information on the best Keller submersible product for your application, contact Keller today.

Your application, contact Keller today.

For information on the best Keller submersible product for

protection at no additional cost.

lead time and several models include guaranteed lightning



In the heart of Texas lies the Trophy Club Municipal Utility District 1's Wastewater Treatment Facility. That's where Karl Schlielig, Jeff Richey and the rest of the team are working hard to keep up with increased demands, while still delivering high-quality effluent.

Thanks to the expansion of USABlueBook's nationwide distribution network, the team in Trophy Club is getting exactly what they need, quicker than ever. "We thought you guys were fast before," shared Jeff, "but now we just pick our stuff up from Will Call over at your new warehouse. Last summer we were doing some work on our return pumps, and it was so easy to just run over there and get what we needed. It's great!"

"We thought you guys were fast before, but now we just pick our stuff up from Will Call over at your new warehouse."

"We like USABlueBook because you guys make things easy... your close warehouse, the way you work our account POs [billing process]... we even like the phone number of 1234," Jeff laughed.

Karl Schlielig
WW Superintendent
Trophy Club MUD 1
Trophy Club, TX



Jeff Richey
Crew Leader
Trophy Club MUD 1
Trophy Club, TX

Featured Products From **USABlueBook**[®]

Get the most out of your transmitter — measure flow, DO, pH/ORP, chlorine, turbidity, conductivity and more!

GF Signet 9900 Series Transmitters

- Single-channel interface for multiparameter measurement
- Large 3.9" x 3.9" auto-sensing backlit display offers optimal visibility
- Time-saving automatic sensor recognition



Use the GF Signet 9900 transmitter to measure a wide variety of parameters including flow, DO, pH/ORP, chlorine, turbidity, conductivity/resistivity, pressure, temperature and level. Display shows separate lines for units, as well as main and secondary measurements, plus a dial-type digital bar graph. Additional programming features are available using the optional PC COMM Configuration Tool (sold separately). 12 to 32 VDC (24 VDC nominal). **Note:** Transmitters require the use of parameter-compatible modules (sold separately).

To order your complete 9900 Transmitter System, contact the USABlueBook Technical Support Team at 1-800-548-1234.



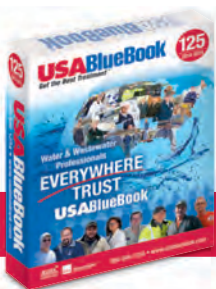
Panel-Mount Transmitter

Field-Mount Transmitter



DO Sensor

For more information, see pages 374, 1116 and 1127 in USABlueBook Catalog 125.



USABlueBook[®]
Get the Best Treatment[™]

800-548-1234 • www.usabluebook.com