TREATMENT PLANT OPERATOR
tpo™
DEDICATED TO MUNICIPAL WASTEWATER PROFESSI
www.tpomag.com
AUGUST 2011

Lab Detective: Getting to the root of odor problems

PAGE 32

How We Do It: Biosolids dewatering in Bonnechere Valley, Ont.

PAGE 42

Jim Pynn
Plant superintendent
New York, N.Y.

Difference Maker

JIM PYNN FULFILLS A GOAL AS SUPERINTENDENT OF NYC'S BIGGEST TREATMENT PLANT

PAGE 24

Greening the Plant: Solar energy in Willingboro, N.J.

PAGE 12

OVIVO
Bringing water to life

Do you have Eimco Water Technologies™ or Dorr-Oliver® Equipment?

OVIVO offers OEM Solutions to
Rebuild or Upgrade Your Equipment.

Features & benefits

- Drive rebuilds–Appx. 1/2 the cost of new
- Extend equipment life and performance
- Retain the value you already have invested in your equipment
- Retrofit existing equipment with OEM factory proven drives and equipment
- No more costly maintenance, labor & downtime

CLARIFIER REBUILDS

Features & benefits

- Field service engineer on site for inspection or check out
- Ovivo field installation crews located across the country
- Job is always done right and on time
- Many years of experience with rebuilding & upgrading our equipment

TURN-KEY SOLUTIONS

Features & benefits

- Knowledgeable sales staff
- Technical support to find a solution on the phone
- Customer satisfaction is our way
- Full factory warranty on workmanship & parts

QUALITY OEM PARTS

Features & benefits

- Carrousel® aeration gearbox rebuilds & upgrades
- Rotary distributor repairs and upgrades
- Sludge mixer rebuilds
- Headworks equipment, Brackett Green® and Jones & Attwood screens and rakes can be rebuilt on site or at the factory

EQUIPMENT REBUILDS

Aftermarket Services

Whether rebuilding your equipment or supplying OEM replacement parts, Ovivo Aftermarket Services will always provide superior customer service and support to achieve the best possible results.

Contact us today and we will arrange a free on site inspection of your Eimco Water Technologies or Dorr-Oliver equipment.
Rebuilds.us@ovivowater.com 801-931-3111.

*Dorr-Oliver is a registered trademark of FLSmidth A/S

ovivowater.com

TECHNOLOGY LEADERSHIP FROM THE BEGINNING

DECADES OF DELIVERING LONG-TERM, SUSTAINABLE RESULTS

THE WORLD HAS CHANGED A LOT IN THE LAST 50 YEARS, BUT THE IMPORTANCE OF RELIABLE VALUE, REMAINS UNCHANGED

From day one, Ashbrook Simon-Hartley has focused on providing water and wastewater solutions that get the job done in a cost-effective way. This has always meant bringing knowledge, experience and the right technology to your project or facility.

Over the years, this has meant everything; from choosing the right materials and components to customizing the treatment process to meet specialized requirements; from innovative solutions to retrofits that stretch your budget; and from individual replacement parts to "influent-to-effluent" process design.

Now, after decades of experience with the smallest of projects in our own backyard to world-changing projects at the ends of the earth (and almost everywhere in-between), we are fully prepared to support you in meeting the new challenges of providing clean water to your world.

If you have a goal, a plan, or just a question, simply contact your area Ashbrook Simon-Hartley representative and we'll show you what our knowledge, experience & technology can do for you—now, and in the future.

TREATMENT PLANTS
DEWATERING
CLARIFIERS
DISINFECTION
FILTRATION
AERATION
MEMBRANE TECHNOLOGIES
MUNICIPAL
INDUSTRIAL
FLOW CONTROL
CLASS A BIOSOLIDS

Visit us at WEFTEC 2011 in Booth 2648

www.as-h.com

NORTH AMERICA:
Ashbrook Simon-Hartley
800.362.9041
fax: 281.449.1324
11600 East Hardy
Houston, TX 77093-1098
USA

EUROPE, ASIA, AND THE AFRICAS:
Ashbrook Simon-Hartley Ltd.
+44 (0) 1782 578650
fax: +44 (0) 1782 260534
10/11 Brindley Court
Lymedale Business Park
Newcastle-under-Lyme
Staffordshire
ST5 9QH UK

SOUTH AMERICA:
Ashbrook Chile S.A.
+56 (2) 224 7858
fax: +56 (2) 224 9525
Avenida Presidente Kennedy 5757
Torre Oriente, Oficina 501
Comuna de Las Condes
Santiago, Chile

Ashbrook Simon-Hartley®

KNOWLEDGE, EXPERIENCE & TECHNOLOGY

CERTIFIED 9001 USA | United Kingdom | Chile | Republic of Korea | Brazil

advertiser index

AUGUST 2011

Aerzen USA 23
AllMax Software, Inc. 57
Analytical Technology, Inc. 50
Ashbrook Simon-Hartley 3
BDP Industries, Inc. 34
Bio-Barge 8
Blue-White Industries 4
Bright Technologies 10
ClearSpan Fabric Structures 33
Enviro-Tech of America, Inc. 57
Environmental Dynamics International 8
Environmental Express 43
Flo Trend Systems, Inc. 47
Fluid Dynamics Inc. 57
Fournier Industries, Inc. 50
Fresh Creek Technologies, Inc. ... 46
Greyline Instruments, Inc. 9
Hach Company 5
Headworks Inc. 27
Huber Technology, Inc. 9, 11, 13
Infilco Degremont, Inc. 46
JDV Equipment Corporation 34
John Meunier 57
JWC Environmental 51
Komline-Sanderson 57
KROHNE, Inc. 41
Kuhn North America, Inc. 13
Lakeside Equipment Corporation 60
Meltric Corporation 57
MISSION Communications 35
NAWT, Inc. 53
Netzsch Pumps North America LLC 11
Novozymes 41
Ovivo 2
PacTec Inc. 7
Prime Solution, Inc. 41
Rain for Rent 39
Roto-Mix, LLC 35
Schreiber LLC 19
Simple Solutions Distributing 57
Smith & Loveless, Inc. 15
UV Superstore, Inc. 11
Vaughan Company, Inc. 21
WeirWasher Automated Cleaning Systems 15
WesTech Engineering, Inc. 53
CLASSIFIEDS 56

tpo TREATMENT PLANT OPERATOR

DEDICATED TO MUNICIPAL WASTEWATER 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

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

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. 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, return the subscription card attached to each issue; visit www.tpomag.com or call 800-257-7222. 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 nicole!@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 nicole!@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 jeff!@colepublishing.com. To order back issues, call Nicole at 800-257-7222 (715-546-3346) or email nicole!@colepublishing.com.

CIRCULATION: 72,137 audited copies per month.

Audit Bureau of Circulations

What would you do with $50,000 of FREE Hach equipment? Learn more at: hach.com/bigpicture

What you don't see can be costly.

Have you ever wondered what you are missing between measurements? Not seeing warning signs can increase expensive chemical and energy costs. Hach, the industry leader in nutrient monitoring, has expert service and the most extensive portfolio of online and lab instrumentation—so you can see the BIG picture.

Want to see the big picture? Go to: hach.com/bigpicture

M116ML

HACH®

Be Right™

contents

August 2011

features

12 GREENING THE PLANT: A REAL NO-BRAINER
Solar energy brings quick cash flow for a New Jersey utility authority — and power generation with a biogas-fueled microturbine sweetens the deal.
By Doug Day

14 TECH TALK: OUTSIDE THE BOX
Students at the University of Nevada – Reno develop a novel technology for drying biosolids and turning it into a high-quality fuel.
By Doug Day

16 TOP PERFORMER – PLANT: MAKING IT FIT
A 2009 upgrade brings new and different secondary treatment and solids processing systems to a treatment plant in Missouri.
By Jim Force

22 HEARTS AND MINDS: STEP BY STEP
A simple animation program walks visitors through every step of wastewater treatment at the Harlingen WaterWorks System facility.
By Doug Day

24 TOP PERFORMER – OPERATOR: DIFFERENCE MAKER
Jim Pynn dreamed of helping the environment. He has done so in a big way for 38 years, the last 19 as superintendent of New York City's largest treatment plant.
By Ted J. Rulseh

32 LAB DETECTIVE: TOXIC SHOCK
Here are ways to find out if your plant process has been affected by some kind of toxic waste stream — and some things you can do about it.
By Ron Trygar, CET

36 TOP PERFORMER – BIOSOLIDS: ALWAYS ON TRACK
A highly automated dewatering and transfer facility provides state-of-the-art biosolids processing for the Clark County Water Reclamation District.
By Doug Day

42 HOW WE DO IT: IN THE BAGS
An Ontario treatment plant finds a cost-effective biosolids dewatering solution in flexible and permeable geotextile tubes.
By Scottie Dayton

44 IN MY WORDS: CATALYST FOR EDUCATION
Maine's coordinated training program draws on a host of resources from the wastewater community and from vendors, consultants and others.
By Doug Day

53 VISITORS: BIRD WATCHING
By Ted J. Rulseh

departments

8 LET'S BE CLEAR: WHERE IT ALL BEGINS
For all that massive plant equipment, treatment is driven by results in the lab. Tell us about your analytical challenges and successes.
By Ted J. Rulseh, Editor

10 LETTERS

28 CASE STUDIES: HEADWORKS/BIOSOLIDS
By Scottie Dayton

48 PRODUCT NEWS
Product Spotlight: Converter Combines Flow and Analysis in One Device
By Ed Wodalski

52 INDUSTRY NEWS

54 PRODUCT FOCUS: HEADWORKS/BIOSOLIDS
By Pete Litterski

58 WORTH NOTING
People/Awards; Education; Calendar of Events

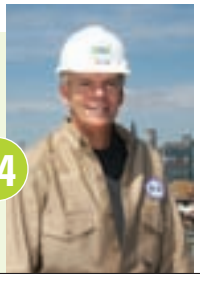
COMING NEXT MONTH: SEPTEMBER 2011

Special Issue: Digital Technology

- Let's Be Clear: The Power of Wastewater
- Top Performer – Plant: Padre Dam Water Recycling Facility, Santee, Calif.
- Top Performer – Operator: Jeff Rewerts Jr., Mason, Mich.
- Top Performer – Plant: Nutrient recovery in Durham, Ore.
- How We Do It: Odor-control transparency in Hampton Roads, Va.
- Hearts and Minds: Student programming in Bellingham, Wash.
- In My Words: Public-private solutions for water and wastewater funding
- Greening the Plant: Digester feeding to boost methane in West Lafayette, Ind.
- Tech Talk: Continuous-fill, intermittent-discharge SBR in Town of Essex, Ont.

on the cover

Jim Pynn has led Brooklyn's Newtown Creek Wastewater Treatment Plant through a major multi-year expansion and upgrade. He was the winner of the 2002 William D. Hatfield Award for outstanding performance and professionalism from the Water Environment Federation. (Photography by Sonny Maxon)



PACTEC

We manufacture packaging. We engineer solutions.

GeoPac™ Geotexile Dewatering Tubes

The waste water treatment solution for effective dewatering.

The GeoPac provides continous filling in conjunction with outward pressure. We custom engineer each GeoPac to provide the optimal solution for your onsite dewatering needs.

PacTec uses various filtration fabrics to custom engineer and manufacture its geotextile dewatering tubes to solve your unique dewatering needs. PacTec's mission is to be your unsurpassed resource for engineered dewatering solutions.

Applications

- Lagoons
- Tanks
- Digester Cleanouts
- Industrial Sludge
- Cooling Tower Sludge
- Settling Pond Sludge

Advantages

- Sludge directly pumped from digester and lagoons
- Can be sized to fit drying beds
- Can be designed to fit in roll-off boxes
- Eliminates volume increase when using solidification agents
- Can be custom engineered for limited space applications
- Reduces disposal volumes and the GeoPac itself is disposable

Call or Click:

877-547-5682 **pactecinc.com/tpo**

Where It All Begins

FOR ALL THAT MASSIVE PLANT EQUIPMENT, TREATMENT IS DRIVEN BY RESULTS IN THE LAB. TELL US ABOUT YOUR ANALYTICAL CHALLENGES AND SUCCESSES.

By Ted J. Rulseh, Editor

In college I had a choice. I loved to write. I also loved the sciences. At the risk of seeming less than modest, I will say I was quite good at both.

What I discovered after my junior year was that, as much as I enjoyed the intricacies of science, the concepts, the calculations, the sheer wonder of it, I hated working in the lab.

For one thing, I had this odd tendency, when doing experiments, to assume what the outcome "should" be, and to try and nudge the results in what I thought was the right direction. So some of the graphs and charts in my lab reports were in considerable conflict with the way the physical world actually behaves.

More than that, it wasn't in my nature to be as meticulous as lab work requires. I just didn't like measuring minute quantities of stuff on analytical balances, reading precise levels on a burette, making meticulous drawings of algae cellular structures seen under a microscope, using aseptic procedures in microbiology class, and so on.

So my choice was: writing or science? Except it really wasn't a choice at all — I figured out that I could have both. I could work my way into a career in which I would write about science, or at least write about technical topics for which my background (biology minor, course work in chemistry, physics and calculus) would come into play.

CRITICAL PROCESS

So it has been. I retain substantial respect for people who did become scientists, or teachers of science, or users of science, like wastewater operators. The more I'm around the industry, the more it's apparent how critical the lab side of the business is.

In a way it's remarkable: These massive flows come in and go through huge channels, screens, pumps, basins, presses and centrifuges — and yet the whole process is in the service of organisms we can't see without magnification, and chemical reactions even more arcane and invisible.

The way all that water flows, all those gears turn, and all those blowers aerate is driven by results derived in laboratory instruments and test tubes. And so, *Treatment Plant Operator* is stepping up its emphasis on the lab.

The first of our "Lab Detective" articles appeared in May, and the second appears in this issue. The author is Ron

The way all that water flows, all those gears turn, and all those blowers aerate is driven by results derived in laboratory instruments and test tubes. And so, *Treatment Plant Operator* is stepping up its emphasis on the lab.

Trygar, senior training specialist in water and wastewater at the University of Florida's TREEO Center and a certified environmental trainer (CET).

We're pleased to have Ron as a contributor. In articles every two or three months, he will explore different lab challenges and walk through analytical riddles.

WHAT ARE YOUR ISSUES?

Of course, Ron has a full-time job and can't write for us as regularly as we or he might like. So we're asking you to help out. Send us ideas on laboratory issues that have been puzzling you. Tell us how you've used lab analysis to diagnose and solve problems.

You don't need to be a brilliant writer. Just send me a note to editor@tpomag.com that explains what you did. I'll follow up by phone. We can chat for a while and I'll put a story together — or hook you up with a writer who can.

We'd like to report regularly on laboratory matters, and of course we want to provide information as timely and relevant for you as possible. So get in touch and tell us about your success stories, or your ongoing puzzles. We look forward to your contributions and the help they can provide to treatment operators across the country. **tpo**

letters

It's About Time

In regard to your column, "Your Most Critical Audience?" (*TPO,* July 2011): Amen! "We're at the end of the pipeline and we take (stuff) from everybody!" That is how many operators felt until *TPO* came along.

Bless you, as you have brought new life to many operators. But your editorial and the subject article are so true. We all need to teach upward and hope they want to listen and if not, try, try again. I'd like to share a few facts with you. I think we all want to do what you suggest, but don't have the foresight or resources to pull it off.

So, here are some past examples. Jerry Kitelinger, retired operator from Tomah (the plant you previously highlighted) wanted to do something just as you suggested. So, Jerry and the biology teacher from the high school made a homemade video of waste from the home to, eventually, the river.

They started in the house and flushed the toilet and then went out to the street and opened several manholes, and then went on to the lift pumps, screening, grit removal, biological process (with videotape of bugs) and so on. I asked Jerry for a copy and shared it with others and used it with our office staff as a means to start the awareness and educational process of wastewater biology.

Steve Myers is a graduate biological process engineer. His dad operates a wastewater plant in Utah. They play around with the biological biomasses. His dad mentioned that it was too bad there were no training videos on the oxidation ditch treatment technology. Steve is a computer guru and he made about half a dozen wastewater training videos that are for the common layman. I think his oxidation ditch video is exceptional.

And we don't have to go over the previously discussed industry image change (name change from wastewater treatment to water reclamation) that this industry needs, as we did that once before. Keep up the good work, as it is refreshing to many. You are a big part of this change and we thank you for recognizing the need. We trust you are finding it beneficial to all including yourself and your future.

Harlan Mueller
Energenecs

A Real No-Brainer

SOLAR ENERGY BRINGS QUICK CASH FLOW FOR A NEW JERSEY UTILITY AUTHORITY — AND POWER GENERATION WITH A BIOGAS-FUELED MICROTURBINE SWEETENS THE DEAL

By Doug Day

An initial estimate of $12 million didn't scare away the Willingboro (N.J.) Municipal Utilities Authority from adding substantial renewable energy resources. It helped when project costs came in much lower than first thought.

Then funds from the American Reinvestment and Recovery Act (federal stimulus) and New Jersey renewable energy rebates made the picture that much brighter.

"We have a positive cash flow in the first year," says Joe Bateman, executive director. The work included solar photovoltaic installations at the Willingboro Pollution Control Facility (879,500 kWh/yr) and the city's water treatment plant (271,000 kWh/yr). The total cost was about $8 million: $2.5 million at the water treatment plant and $5.6 at the wastewater plant. ARRA funds paid 45 percent, and state rebates will cover the rest.

Bateman had no reservations about adding such a large solar facility. "I had no hesitation," he says. "The payback would have been much longer, but being awarded the state and federal funding made it a no-brainer."

POSITIVE REACTIONS

The wastewater plant also added a Capstone C65 microturbine and gas cleanup unit at a cost of just over $925,000 to generate 550,000 kWh per year from digester gas. "It was initially a cost-control, business-driven decision," adds Bateman, "but we also looked at what we would contribute to our community, the region, and the state from a green perspective, and the positive public relations."

He says the public appreciates both the efforts to be a better steward of the environment and to save customers money. All told, the renewable energy work will reduce the authority's energy costs by about 25 percent — $300,000 per year — saving every customer just over $19 annually. "We can pass on the savings to customers, or at least mitigate future rate increases," Bateman says. "Energy costs are our second-largest cost of operation."

Using the sun will also decrease annual emissions of carbon dioxide by nearly 1.7 million pounds, sulfur dioxide by 6,500 pounds, and nitrogen dioxide by 2,500 pounds, in addition to a significant reduction in mercury, according to Bateman.

ENERGY CREDITS

The Willingboro Pollution Control Facility is a 5.5 mgd two-stage trickling filter plant serving 65,000 people in and around the city, just northeast of Philadelphia. The solar installation went online in October 2010; about a month after the water treatment plant's solar panels went into operation.

> "I had no hesitation. The payback would have been much longer, but being awarded the state and federal funding made it a no-brainer."
>
> **JOE BATEMAN**

Some 3,300 photovoltaic panels cover five acres at the Willingboro Pollution Control Facility. With the help of government incentives, the system will pay for itself quickly.

PHOTOS COURTESY OF WILLINGBORO POLLUTION CONTROL FACILITY

Biogas that used to be flared now flows from the digesters at the Willingboro treatment plant through a gas treatment system before powering a microturbine. Combined with a photovoltaic system, the plant will get nearly 60 percent of its electricity from renewable energy.

What's Your Story?

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

Along with the positive cash flow in the first year, the city's utility department will be able to sell renewable energy credits through PJM Interconnection, the regional power manager. The credits will earn the utility about $580,000 a year.

There are 3,300 Sharp Electronics NU-U230 photovoltaic panels mounted in a fixed array on five acres of plant property, and another 2,000 at the water treatment plant. The least expensive type of solar installation, a fixed array does not move with the sun, limiting its total output.

Bateman says project engineers from Alaimo Group and general contractor APS Contracting considered a tracking system. "It would have been somewhat better, but the calculations showed that the increase in maintenance and capital costs over the life of the project would be more than we would save," he recalls. Tracking systems are generally better in areas that get high levels of usable sunshine year-round.

NO TRADE-OFF

Such a trade-off decision wasn't necessary with the microturbine project from Unison with an Applied Filter Technology siloxane removal system. That project became fully operational in spring 2011. "We just had to tap into the gas with a new valve," Bateman says. "Instead of flaring it off, we just redirected the gas to the microturbine."

Together, the solar system and microturbine will generate about 58 percent of the wastewater plant's electrical needs. The next step is to see if increased biogas production will pay off. "There is sufficient gas production in our two-stage digester," says Bateman. "We are looking at better mixing in the digester and perhaps the addition of some FOG from our local restaurants to increase our gas production and keep that waste out of the landfills." **tpo**

Outside the Box

STUDENTS AT THE UNIVERSITY OF NEVADA – RENO DEVELOP A NOVEL TECHNOLOGY FOR DRYING BIOSOLIDS AND TURNING IT INTO A HIGH-QUALITY FUEL

By Doug Day

The University of Nevada — Reno has a business opportunity for a wastewater plant looking for an efficient and creative solution to one of its major expenses. Its chemical engineering students have come up with a new process for drying biosolids so that it can be converted to fuel. Their idea has been proven in the field and is ready for a commercial-scale pilot project.

"We started in 2006 looking at converting solid waste to energy," says Chuck Coronella, Ph.D. and associate professor of chemical engineering, who led the project. "Wastewater biosolids is a good candidate because it's uniform and you can find it everywhere."

The University of Nevada – Reno's prototype fluidized bed dryer was built in the chemical engineering lab. The university is now seeking partners and investors for a full-size commercial pilot project.

The students' work received funding from the California Energy Commission and the U.S. Department of Energy. "We've applied for a patent on our novel fluidized bed dryer," says Coronella. "One of the uses is likely to be the production of power."

PROVEN CONCEPT

The fluidized bed dryer operates at the very low temperatures of 120 to 150 degrees F. Rather than use a fuel like biogas or natural gas, it runs off waste heat from a boiler or cogeneration unit. "What comes out is a very dry powder, typically around 5 to 8 percent moisture content," says Coronella.

Dewatered biosolids, about 80 percent water, is fed into the fluidized bed. Air is injected through the material and the bed, made of an inert material like sand, creating a vigorously bubbling mixture.

"Because it's bubbling, the biosolids heats up rapidly and breaks apart," says Coronella. "The smaller fragments dry quickly because they have much more surface area. As they dry, they break up faster and faster until the fragments are so small that, like dust, they are carried up by the airflow and can be captured in filters."

"We started in 2006 looking at converting solid waste to energy. Wastewater biosolids is a good candidate because it's uniform and you can find it everywhere."

CHUCK CORONELLA

PHOTOS COURTESY OF UNIVERSITY OF NEVADA – RENO

ABOVE : A fluidized bed can run off waste heat because it dries biosolids at temperatures as low as 120 degrees F to create a dry powder with very low moisture content. LEFT: The fluidized bed dryer concept was proven during a four-month demonstration project at the Truckee Meadows Water Reclamation Facility in Reno.

The students' design was built in the university lab and put into operation at the Truckee Meadows Water Reclamation Facility in Reno. After some kinks were worked out, it processed 20 pounds of wet biosolids per hour to produce three pounds of dried powder. "It was impressive from a technology development perspective," says Coronella.

He worked with three chemical engineering students — undergraduates Chris Moore and Cody Niggemyer and graduate student Mike Matheus. Their demonstration project ran for as long as seven hours at a time over nearly four months in the summer of 2010. "We did several tests exploring the behavior of the process," Coronella says. "Things like temperature and time and other parameters we can manipulate, to see how those affected performance." The next step for the R&D project is to produce fuel pellets from the powder. The fuel has a BTU value similar to dried wood.

FROM THE LAB

"It is an environmentally friendly and economical solution," says Michael Birdsell, director of intellectual property marketing for the

university's Technology Transfer Office, who sees "significant opportunity" for commercialization from the students' work.

His office is charged with finding partners and markets for technology developed by faculty and students doing research on campus. For example, UNR has recently licensed an enhanced method for removing arsenic from drinking water to EaglePicher Corporation.

"The U.S. generates the equivalent of 8 million tons of dry biosolids a year," he says. "The cost of disposal is roughly $2 billion annually and is one of the primary costs for wastewater treatment plants."

"Converting waste to energy is rich with opportunities. There are much better ways for us to think about waste. It can be a valuable resource."

CHUCK CORONELLA

He estimates that a fluidized bed dryer would cost about $2 million and could pay for itself in 10 years. "We're looking for a wastewater plant partner that can offer investment and support for a commercial-scale pilot project," says Birdsell. He is also seeking grants, investors, and other ways to fund the commercialization and is talking to engineering firms, equipment companies and startup environmental companies that may be interested in moving the process into practical application.

"Converting waste to energy is rich with opportunities," says Coronella. "There are much better ways for us to think about waste. It can be a valuable resource." **tpo**

Making It Fit

A 2009 UPGRADE BRINGS NEW AND DIFFERENT SECONDARY TREATMENT AND SOLIDS PROCESSING SYSTEMS TO A TREATMENT PLANT IN MISSOURI

By Jim Force

HIKERS AND BIKERS ON THE TRAIL PAST THE NEWLY upgraded Washington (Mo.) Wastewater Treatment Facility probably have no idea about the innovative technology at work beyond the fence. But Kevin Quaethem, John Zimmermann and their staff already have learned a great deal about their new Vertical Loop Reactor (VLR) treatment and Cannibal sludge reduction system, and they're gaining important process knowledge with each passing day.

The new 4 mgd (design) plant replaced an old trickling filter facility that was over design capacity, had deteriorating concrete structures, and was held together "by duct tape and wire."

"It's been a pretty steep learning curve," Quaethem says. "Before, there was not much to monitor, but now we're monitoring regularly for sludge blankets, mixed liquor, suspended solids, return activated sludge suspended solids, settleability, pH, oxygen reduction potential (ORP), dissolved oxygen (DO), and more. With the addition of so many new processes, maintenance requirements have increased, as well."

Quaethem adds that his team has handled the upgrade with no increase in staffing. The key is communication. "We need to make sure we're doing things properly," Zimmermann says. "We talk every day. Communicate, communicate, communicate."

OLD DAYS

Washington, population 15,000, nestles alongside the Missouri River some 60 miles southwest of St. Louis. Before the recent upgrade, wastewater was treated in a plastic-media trickling filter plant with a design capacity of about 2 mgd.

By the early 2000s, flow had increased to 2.3 mgd, and it was obvious that capacity had to be expanded. But as in many municipal treatment operations, space was an issue. The riverfront around the plant had been declared a flood zone, and no new structures were allowed, forcing the city's design consultant, Jacobs Engineering of St. Louis, to come up with a new process that wouldn't appreciably increase the facility's footprint.

The Washington Wastewater Treatment Plant team includes, from left, Kevin Massmann, operator 3; Doug Grafrath, operator 3; John Zimmermann, chief operator; Kevin Quaethem, water/wastewater superintendent; David Pickett, wastewater collections operator 3; and Gary Bouge, operator 1. (Photography by Curt Dennison)

"We need to make sure we're doing things properly. We talk every day. Communicate, communicate, communicate."

JOHN ZIMMERMANN

profile

City of Washington (Mo.) Wastewater Treatment Facility

BUILT:	1967; upgrades 1978, 1993, 2009
POPULATION SERVED:	15,000
AREA SERVED:	14 square miles
FLOW:	2.43 mgd average
TREATMENT LEVEL:	Advanced secondary
TREATMENT PROCESS:	Activated sludge/vertical loop reactor
BIOSOLIDS:	Cake to landfill or land application
ANNUAL BUDGET:	$1.3 million
WEBSITE:	www.ci.washington.mo.us
GPS COORDINATES:	Latitude: 38°32'33.57"N; Longitude: 90°58'20.67"W

Kevin Massmann, operator 3, inspects the drum screen in the influent headworks.

THE VALUE OF CROSS-TRAINING

The City of Washington employs a small staff to manage, operate, and maintain its new $22.6 million wastewater treatment plant. Staff size is frozen, as are wages. It's a situation common across the country and is a direct result of the recession.

That makes cross-training vital to success. Superintendent Kevin Quaethem is responsible for the water and wastewater departments, and he makes sure that staff at both ends of the water spectrum are able to work on either side.

"We have three positions at the wastewater treatment plant, plus two in collections handling 112 miles of sewers and nine pump stations; and six positions at the water department," he says. "Through cross-training, water department employees or sewer collections specialists can help out at the treatment plant if necessary."

Besides Quaethem and chief operator/lab analyst John Zimmermann, the wastewater staff includes operator/lab technician Doug Grafrath, operator/mechanic Kevin Massmann, and collection system workers David Pickett and Gary Bouge.

"We do everything here," says Zimmermann. "We wear lots of hats, from O&M, to lab work, to reports, to biosolids hauling, to monitoring the industrial pretreatment program." Normal operations are from 7 a.m. to 3:30 p.m. five days a week. Designated operators are on call for weekends.

All operators have their state certification, from Grade D up to Grade A, and most are certified for both water and wastewater treatment by the Missouri Department of Natural Resources. Training is ongoing, but instruction intensified during the startup phase of the new plant when the engineer, contractor, and manufacturers were on site for an extended period.

"It's extremely important for us to communicate every aspect of the operation to each other," says Zimmermann. "We have to move guys around wherever we can. Our staff is really dedicated. They take the job personally."

Water/wastewater superintendent Kevin Quaethem, left, and chief operator John Zimmermann.

The answer was the VLR biological technology coupled with the Cannibal sludge reduction process, both supplied by the Envirex products group of Siemens Water Technologies.

"The VLR is basically an oxidation ditch turned on its side," says Zimmermann. "We have four VLRs in series here." The series of looped reactors allows for DO stratification, and while treatment capacity is the same as an oxidation ditch, the VLR consumes much less space.

The Cannibal process combines a non-biodegradable material removal step with a series of reactors where solids interchange and cycle between aerobic and non-aerobic environments. As a result, solids are destroyed, and the amount of biosolids is significantly reduced.

As for the rest of the plant, a new preliminary treatment headworks building accepts influent at an elevation that allows gravity flow to carry the water completely through all the processes to the Missouri River.

MOVING ON THROUGH

The preliminary treatment building houses a pair of influent channels, one for normal flow and the second for high flows due to rainfall. A third channel is available as a bypass. "With these processes inside a building, we avoid equipment failures due to freezing," says Zimmermann.

Parkson 5 mm bar screens remove debris, automatically activating when they blind. "We get a lot of debris here, especially in the first flush of a rain-

"From our discussions with the manufacturer, we understand that VLRs can be operated in a number of different configurations. In our case, we run them in series, one through four."

JOHN ZIMMERMANN

storm," says Zimmermann. A Eutek SlurryCup/Grit Snail system supplied by Hydro International further cleans the wastewater before it moves on to the series of VLR units.

"From our discussions with the manufacturer, we understand that VLRs can be operated in a number of different configurations," says Zimmermann. "In our case, we run them in series, one through four. We have flexibility. With air adjustments, we could probably run three, or two, and still meet our treatment requirements. We can handle over 18 mgd with an automated storm flow mode set up on the VLRs to prevent our sludge from becoming unbalanced in our system."

Washington operates the first VLR under anoxic conditions, maintaining an ORP of negative 250, then adds oxygen in the subsequent units so that the dissolved oxygen level is about 1.5 ppm in the fourth or final VLR.

Each rectangular VLR is about 20 feet deep, extending about 10 feet above grade. Upper and lower compartments are separated by a horizontal baffle running the length of the tank. The process has been adapted from oxidation ditch technology and uses surface-mounted discs to provide mixing and deliver oxygen. "The system generates a lot of velocity," Zimmermann observes.

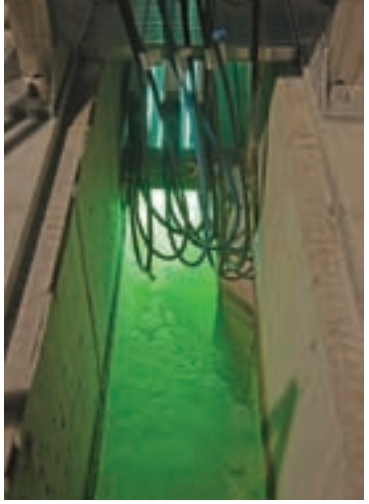
The process achieves significant ammonia nitrogen reduction, even though the plant is required only to monitor that parameter. Zimmermann estimates 25-27 mg/l of ammonia nitrogen enters the plant, while the effluent contains less than 0.1 mg/l. He reports some phosphorus reduction, as well.

After biological treatment, the flow splits and passes to a pair of 90-foot-diameter Tow-Bro clarifiers (Siemens). A TrojanUV 3000+ system disinfects effluent from April through October, the period of high public contact with the river. The units consist of two channels with six UV modules in each and have an automatic lamp cleaning system. During winter, the staff pulls and thoroughly cleans and maintains the modules. Coliform counts are less than 10 CFU per 100 ml.

The Eutek Grit Snail dewatering escalator supplied by Hydro International, showing the cleated belts that carry and dry grit removed from the wastewater.

SLUDGE REDUCTION

The Cannibal process is designed to reduce biosolids ultimately needing handling. At Washington, the



The plant's TrojanUV 3000+ disinfection unit.

Doug Grafrath, operator 3, monitors the plant's SCADA system (ECC).

City of Washington (Mo.) Wastewater Treatment Facility PERMIT AND PERFORMANCE			
	INFLUENT	EFFLUENT	PERMIT
BOD	222 mg/l	4.0 mg/l	30 mg/l
TSS	244 mg/l	3.4 mg/l	30 mg/l
Fecal coliform		<10 per 100 ml	400 per 100 ml
Ammonia as N		<0.1 mg/l	Monitor

Final effluent after UV treatment and before discharge to the Missouri River.

process was retrofitted into two existing clarifiers and two former sludge digestion basins. First, a wedge wire screen removes fibrous materials, such as hair, and other non-biodegradable solids from the stream. A compactor presses this material to 60 to 70 percent solids, and it is stored in a dump container and taken to the city-owned landfill.

Then, in two material trains, the solids pass through the series of tanks where they are interchanged and cycled to promote biodegradation and solids reduction. In the first tank, ORP is maintained at very low levels. In this environment, aerobic bacteria are conditioned for destruction and biodegradation, making their byproducts available for facultative bacteria that can survive in this environment.

> "In the original design, we just had a monitoring function. But we thought since this was a state-of-the-art process, we should have a SCADA system with full operational capability so we added it to the SCADA system in-house."
>
> **KEVIN QUAETHEM**

Zimmermann says the plant has seen a reduction in solids production from 290 to 300 dry tons per year to 280 dry tons per year with the new process, but plant influent TSS is somewhat higher than before. In addition, where plant effluent used to average 25 to 30 mg/l TSS, it now averages less than 4. "We're keeping a lot more solids out of the river," he says. "The Cannibal process has been very effective for us."

In cold weather, solids are wasted from the Cannibal system every two to three days. "In the summer, when the bugs are more active, we usually go several weeks between wasting," Zimmermann says.

Washington was the first plant in Missouri to use the Cannibal system, and one of the first in the country. Zimmermann's team talks with the process experts at the manufacturer by phone once a week to report results and tweak the system. "We adjust aeration rates, and transition times," he says, to get the best results. The staff has found that cycling the biosolids contents between the tanks at night lessens the chance of odor complaints.

A 1993 vintage Ashbrook belt press dewaters solids to about 18 percent, and the cake is hauled by city trucks to the local landfill, where it is used for cover. "Topsoil is very expensive these days," says Quaethem, "so we're saving the city money."

All plant processes are monitored and controlled by a SCADA system supplied by ECC. "In the original design, we just had a monitoring function," says Quaethem, who has experience with automation. "But we thought since this was a state-of-the-art process, we should have a SCADA system with full operational capability so we added it to the SCADA system in-house."

EXPANDABLE

As Washington underwent the 2009 upgrade, plant management and the design engineering firm also kept an eye on future needs. As a result, the new facility is completely expandable to 6 mgd should the need arise. "We've made it easy to expand," says Quaethem. "We can add a third clarifier if necessary; the splitter box is already set up for three basins. We also have room for two additional VLRs and one more RAS pump."

The UV system can easily be expanded by adding additional modules. Says Quaethem, "We're all plumbed up and ready to go."

WATCH THEM IN ACTION

To learn more about Washington (Mo.) Wastewater Treatment Facility, view the video at www.tpomag.com. tpo

more info:

Ashbrook Simon-Hartley
800/547-7273
www.as-h.com
(See ad page 3)

ECC
314/645-2400
www.eccstl.com

Hydro International
503/615-8130
www.hydro-international.biz

Parkson Corporation
888/727-5766
www.parkson.com

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

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

UNMATCHED RELIABILITY

For 50 years, Vaughan Chopper Pumps have offered **guaranteed** performance in the toughest applications. See why the original chopper pump is still unmatched:

- Manufactured In the USA
- Expedited Pumps and Parts
- Guaranteed Performance in Writing
- Superior Life Cycle Costs
- Multi-Million Dollar Inventory
- 30+ Proven Patents
- Hardened Wear Components Standard
- Special Materials Available Include: CD4MCu, 316SS, Chrome Iron, and Alloy 20
- Free Trial Program Available!

Experience Ease of Maintenance With Vaughan Chopper Pumps.

Heat Exchanger

Scum

Screenings

Digester Recirculation

Vaughan

QUALITY CHOPPER PUMPS SINCE 1960.

phone: (360) 249-4042 FAX: (360) 249-6155
email: info@chopperpumps.com web: www.chopperpumps.com

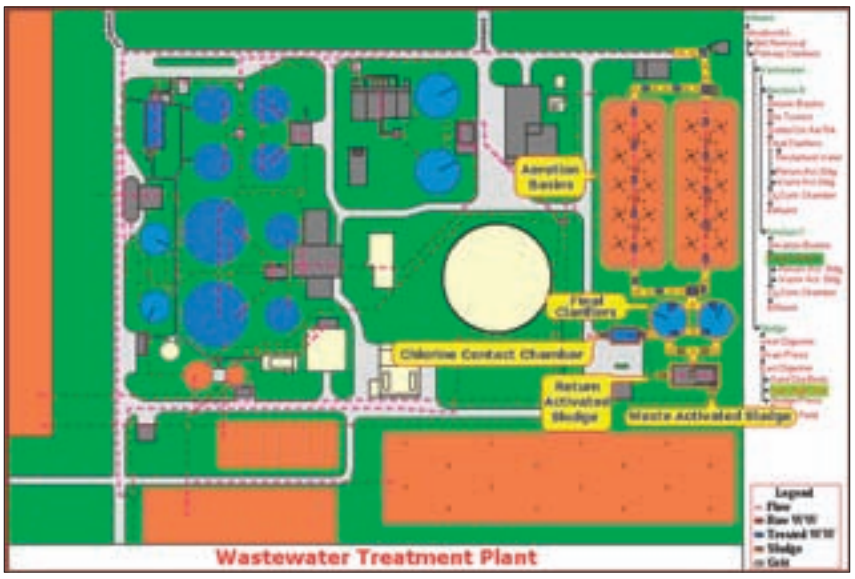
Step by Step

A SIMPLE ANIMATION PROGRAM WALKS VISITORS THROUGH EVERY STEP OF WASTEWATER TREATMENT AT THE HARLINGEN WATERWORKS SYSTEM FACILITY

By Doug Day

GRAPHICS COURTESY OF RANDY REICHLE

When the animated tour guide points to the anoxic basins, a text box pops up to explain that is where "microorganisms metabolize the organic material using nitrates as a source of oxygen."



In the automatic mode, viewers are shown a detailed animation of the Harlingen plant with a short on-screen description of each major component.

Teaching people about what happens after they flush the toilet is a challenge for every wastewater treatment agency.

The 18,000 customers of the Harlingen (Texas) WaterWorks System can now go online to see in-depth animation of how wastewater is cleaned at the city's treatment plant before discharge to the Arroyo Colorado River.

What's Your Story?

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

Environmental compliance director Randy Reichle created an animation of the treatment process that visitors can view on the city website. "I've been doing this type of animation for about 15 years," he says. "When I moved to Harlingen, I noticed we had nothing educational for the public to see how their wastewater is treated. It's something other plants could consider for their own processes."

Reichle's animation is also used at public events, such as career fairs. "We're sending a copy to a local high school because the science teacher wants to show it," he says. "Students are being taught to 'Go Green.' By viewing this animation, they can see how their efforts can help minimize the treatment process. They will learn what is required to keep waters safe for swimming and to keep the fish safe to eat."

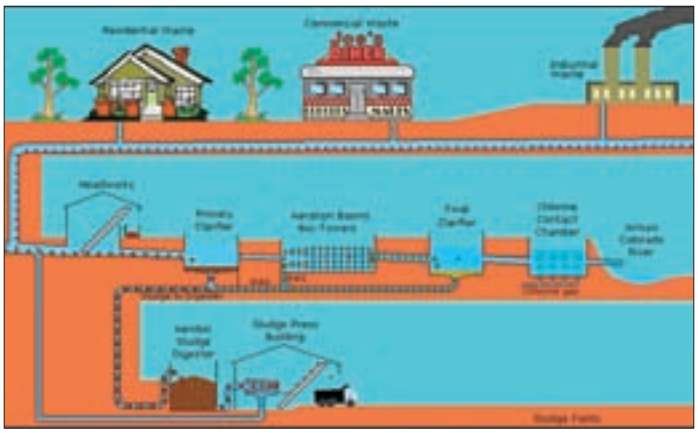
It also helps educate people about the extensive treatment that goes into reclaimed water being used in the community. "That will help them know that the fields receiving reclaimed water are safe for their recreational or sporting events," he says. His work can also be used to help new operators as part of their orientation and training.

DETAILED DESCRIPTIONS

Viewers can watch the 30-minute program in automatic mode, stepping through each animated section, or select specific processes within the 7 mgd plant's operation.

In the automatic mode, a short introduction shows the location of the city 10 miles from the Mexican border and 30 miles from the Gulf coast, along with maps of WaterWorks facilities. A high-level demonstration then shows how waste travels from homes and businesses through a typical treatment plant: headworks, primary clarifier, aeration basins, final clarifier, chlorination and discharge. Biosolids and septage processes are also described.

Next is a detailed animation of the Harlingen plant with a short on-screen description of each major component. For instance, when the animated tour guide points to the anoxic basins, a text box pops



The 18,000 customers of the Harlingen (Texas) WaterWorks System can now go online to see in-depth animation of how wastewater is cleaned at the city's treatment plant before discharge to the Arroyo Colorado River.

"Students are being taught to 'Go Green.' By viewing this animation, they can see how their efforts can help minimize the treatment process. They will learn what is required to keep waters safe for swimming and to keep the fish safe to eat."

RANDY REICHLE

up to explain that is where "microorganisms metabolize the organic material using nitrates as a source of oxygen."

A facility map shows all flow paths in the plant. "Then it breaks it down into the individual processes and shows the flow coming into that process and where it goes," says Reichle. The automatic mode steps viewers through each one in order.

Visitors also can manually view any of 25 individual processes showing, for instance, how wastewater flows from the aeration basins, through final clarifiers and into the chlorine contact chamber. The animated arrows are color-coded to distinguish between raw wastewater, treated water, biosolids and grit.

EASY DOWNLOAD

Reichle's program is available for download at the Harlingen WaterWorks website (www.hwws.com). Reichle spent six months developing the animation using a programming language called Visual C++. It requires the download of an executable (.exe) file.

"The latest technique is Flash programming," he says. Flash is a standard feature of Internet browsers and does not require the download of programs to view the animation. "I'm satisfied with what Visual C++ can accomplish, and I didn't want to learn a new programming language," Reichle explains.

The cost of computer animation varies greatly depending upon the level of detail and quality of the artwork. There are low-cost programs that are relatively easy for a treatment plant staff member to learn. Agencies may also be able to work with student interns to get the work done.

Other plants can link to the Harlingen WaterWorks System download page to help educate their own customers. While it is specific to the Harlingen process, the program provides a good overview of the steps in producing clean water from sewage and can help the public understand how treatment plants in general protect the environment.

"The animation shows people that treating their waste is an expensive and complex microbiological process," says Reichle. "So think before you flush something down the toilet!" **tpo**

DIFFERENCE MAKER

JIM PYNN DREAMED OF HELPING THE ENVIRONMENT. HE HAS DONE SO IN A BIG WAY FOR 38 YEARS, THE LAST 19 AS SUPERINTENDENT OF NEW YORK CITY'S LARGEST TREATMENT PLANT.

By Ted J. Rulseh

ON GRADUATING FROM BROOKLYN TECHNICAL HIGH SCHOOL, JIM PYNN wanted a career in which he could do something every day for the environment.

"My father was a civil servant," says Pynn (pronounced "pin"). "I was the oldest of eight kids, and there was no money for me to go to college. I knew I was going to be limited with just my high school background.

"My mother was concerned about me getting a stable job with good health care and a pension. I looked at what civil service had to offer, and wastewater treatment was about the only thing in the environmental field that New York City had available."

His choice of that career turned out great for him and for the city. Pynn is now superintendent of the Newtown Creek Wastewater Treatment Plant in Brooklyn, the largest of the city's 14 treatment facilities at 310 mgd design flow.

He has led the plant through a major multi-year expansion and upgrade, during which it has remained in consistent permit compliance. Along the way, he and his staff won the 1997 Uhl T. Mann Award for operations excellence from the New York Water Environment Association, and Pynn won the 2002 William D. Hatfield Award for outstanding performance and professionalism from the Water Environment Federation.

He credits his success to a strong team, good mentors, sound facility planning, and excellent communication with employees, contractors and engineers.

Jim Pynn, superintendent of the Newtown Creek Wastewater Treatment Plant in Brooklyn. (Photography by Sonny Maxon)

UP THROUGH THE RANKS

Pynn's first job after high school was with the Consolidated Edison electric utility, but he had taken an entrance exam for a city sewage treatment worker job, the entry level position for wastewater treatment in what is now the city Department of Environmental Protection (DEP).

He hired on as a sewage treatment worker in 1973, working on a mobile crew — truck-based personnel assigned daily via work orders from the plant superintendents. "We would go anywhere in the five boroughs to work on treatment facilities that needed attention," Pynn recalls. "The trucks were outfitted with tools, equipment and supplies, and it was like a shot in the arm for a superintendent to have this gang of 10, 15 or 20 guys show up and get things accomplished."

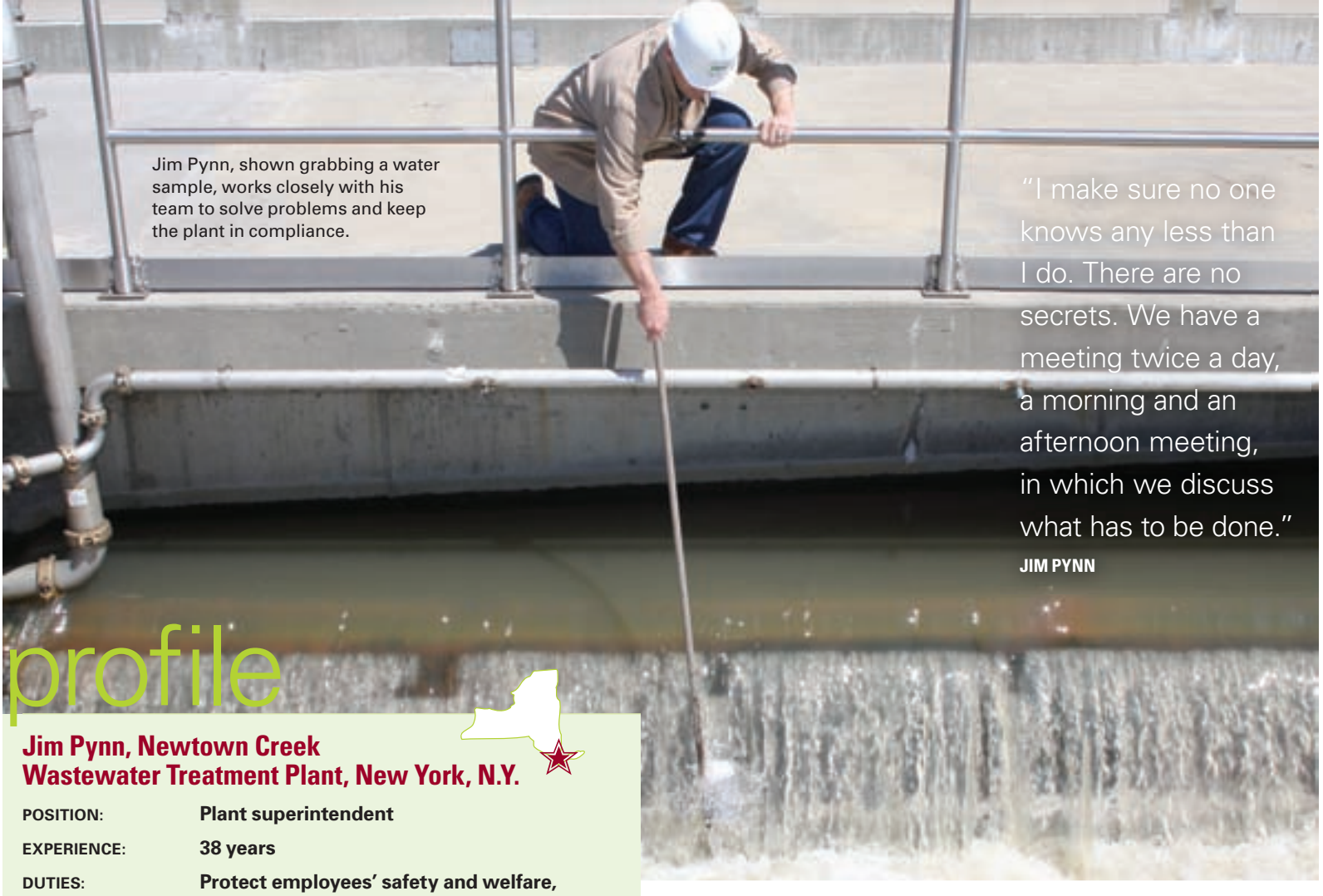
After five years with the mobile crew, Pynn passed a civil service exam for senior sewage treatment worker and became a first-line supervisor in charge of a service truck and a five-member mobile work crew. In 1983 another test qualified him as a stationary engineer — electric, and he worked in wastewater pumping stations and at the city's 120 mgd Owl's Head Wastewater Treatment Plant in Brooklyn.

A year later he was promoted to deputy superintendent at Owl's Head. "From 1984 until 1992, I was the deputy superintendent for operations and construction there," says Pynn. "It's about a third the size of Newtown Creek, but my experience there enabled me to see what a $400 million construction job looks like." The experience would serve him well when he took his present assignment in 1992.

MAJOR CONSTRUCTION

The Newtown Creek activated sludge plant serves a 25-square-mile area that includes parts of the boroughs of Brooklyn, Manhattan and Queens. Pynn oversees 67 operators and mechanics, 50 at the plant and the rest at the massive 500 mgd-capacity Manhattan Pump Station, which conveys wastewater to the plant from Manhattan's Lower East Side across the East River.

As Pynn came on board, facility planning was beginning for what became a $5.2 billion Newtown Creek plant upgrade, now scheduled for substantial



Jim Pynn, shown grabbing a water sample, works closely with his team to solve problems and keep the plant in compliance.

"I make sure no one knows any less than I do. There are no secrets. We have a meeting twice a day, a morning and an afternoon meeting, in which we discuss what has to be done."
JIM PYNN

profile

Jim Pynn, Newtown Creek Wastewater Treatment Plant, New York, N.Y.

POSITION:	**Plant superintendent**
EXPERIENCE:	**38 years**
DUTIES:	**Protect employees' safety and welfare, maintain permit compliance, be a good neighbor to the surrounding community**
EDUCATION:	**Brooklyn Technical High School**
CERTIFICATION:	**State of New York 4A Wastewater Treatment Certificate**
GOALS:	**See the Newtown Creek expansion and upgrade through to completion**
GPS COORDINATES:	**Latitude: 40°43'58.70"N; Longitude: 73°56'45.85"W**

The Newtown Creek treatment plant, framed by the New York City skyline, has seen billions of dollars in construction and upgrades.

Members of the Newtown Creek Wastewater Treatment Plant management team are shown in front of the digester "eggs" for which the plant is known. From left are superintendent Jim Pynn, construction deputy superintendent Jerry Mistretta, maintenance deputy superintendent Bobby Grandner, and operations deputy superintendent Eric Klee.

"The best thing that happens to me is to have a problem, because it seems that just increases my ability to learn. Have a problem, meet the right people, gather the right team, and together you come out with a great end result."

JIM PYNN

completion in 2014 with the same 310 mgd dry-weather design flow today and a maximum of 700 mgd wet-weather flow.

The challenge, besides keeping the plant online and in compliance, was "to build that new facility around the largest existing plant the city had, in a residential and commercial area, without compromising our ability to be a good neighbor," says Pynn.

"We had an enormous amount of truck traffic, noise, dust, and sometimes odor, and all of those issues were on my mind all the time. Running the facility was one thing, but not being a burden to the community was a paramount concern at all times."

CONSISTENT PERFORMANCE

Construction began in 1998 and proceeded in three stages ("batteries" in Pynn's word). In June 2009, the last section of the existing plant (built in 1976), was taken out of service, and all the flow was then passing through eight new aeration tanks with fine-bubble diffusers and 16 new final clarifiers in an upgraded facility two-thirds finished.

"It was at that point we felt we had all the tools in place to achieve good effluent quality — although there was very little redundancy," Pynn says. "Since then, even though the upgrade is not complete, we have outperformed our Clean Water Act permit standard of 85 percent removal on both the TSS and CBOD. It surprised everyone, especially the regulatory agencies, which are very happy with our performance.

"The final battery of the new plant is to be finished by the end of 2014, and it's really necessary to bring us up to a normal amount of redundant equipment to sustain our treatment capacity and the effluent quality we have achieved."

WILLING TO SHARE

Pynn knows the plant's success would not be possible without a quality team that includes deputy superintendents Eric Klee, Anthony Fisher and Robert Grandner. "I have a great group of deputy superintendents and a wonderful group of engineers and first-line supervisors," he says.

He keeps his team engaged through open communication. "I make sure no one knows any less than I do," he says. "There are no secrets. We have a meeting twice a day, a morning and an afternoon meeting, in which we discuss what has to be done. We do it to manipulate the resources needed to keep the facility running and to coordinate with all the construction that's still going on.

"The miracle of this whole project has been that not one drop of sewage has been spilled during the entire 17 years we've been working so far. Being able to repair and maintain and operate, as well as design and construct, all at the same time on our 53-acre parcel — I'm extremely proud of that.

"I work equally well with the construction managers and contractors. Most of the people on both sides of that equation know me on a personal basis. I'm always in the field, and we get a quick response to any issue or problem. We don't let things fester."

STEPPING UP BIG

An October 2006 incident shows how Pynn and his team can rise to a challenge. A contractor was close to commissioning 16 grit tanks, four aeration tanks, and eight final clarifiers, along with a new control building containing the return activated sludge, waste activated sludge and effluent pumps and a great deal of electrical equipment.

"We were a couple of weeks away from finishing that, and we had an enormous early-winter storm in the New York area that was overwhelming

Superintendent Jim Pynn inputs information on the Allen-Bradley control system (Rockwell Automation) in the plant control room.

INTO THE PIPELINE

Always looking for ways to be green at the Newtown Wastewater Treatment plant, superintendent Jim Pynn is excited about a biogas project New York City is undertaking with electricity and natural gas supplier National Grid.

The eight 140-foot-tall, 80-foot-diameter "egg" digesters for which the plant is known produce 2 million cubic feet of methane gas per day. "We consume about half a million cubic feet of that in our boilers to make the heat for the process and domestic heat for the buildings, so there's an excess of 1.5 million cubic feet a day," says Pynn.

"We're entering an agreement with National Grid in which they will install equipment to compress and clean that gas. We're going to eject that gas back into their grid system to use as a gas source for homes in Greenpoint and Brooklyn.

"I'm very excited about that, because presently we are flaring our excess gas. So this project is really going to reduce our carbon footprint by taking that greenhouse gas methane and using it as a wonderful fuel source for a good number of homes."

The project is part of an initiative announced by Mayor Michael Bloomberg to reduce greenhouse gas emissions by 30 percent by 2030 from 2006 levels.

our capacity," Pynn recalls. "It was around five o'clock in the afternoon. We knew the storm was predicted to get worse, so the operations and construction teams and the senior management of DEP decided to take the facility over early.

"That was one of my most memorable nights. We worked completely through the night — we didn't eat, we didn't stop. By the next morning, we had commissioned the first one-third of the brand-new plant into service, and it performed beautifully.

"That meant putting the blowers on for the first time. These were 13,000-volt, 2,500 hp, 35,000 cfm blowers, and we had to get them all started. We had to get all those brand-new pumps running. We had to get the collection mechanisms going. We had to get the hydraulics right, balancing the flow through each of the four aerators and eight clarifiers. We had a massive amount of work to do.

"We pulled in all the day people and all of my senior staff, the contractors' senior staff and startup people, the electricians and laborers, the instrumentation folks. The construction management inspection team was on duty throughout. Everyone we could get, we had on site that night. It had been a very successful 16 or 18 hours by the time we were able to say, 'That's it, we can go home now.'"

MANY MENTORS

Pynn is grateful for the mentors he has had over the years, many now retired. "I can tell you, not having a formal education, I have benefited from being involved and interacting with the diverse and highly educated and technical group that I come across almost every day," he says.

"The best thing that happens to me is to have a problem, because it seems that just increases my ability to learn. Have a problem, meet the right people, gather the right team, and together you come out with a great end result."

Early in his career, Pynn drew encouragement from John Donnellon, deputy director in the Bureau of Wastewater Treatment. "John was a real hands-on guy," he recalls. "When I was in my earlier roles, he helped me recognize that there was a future for me in a higher management position. I never forgot him for that."

He also praises Caswell Holloway, DEP commissioner, appointed two years ago by mayor Michael Bloomberg when his predecessor left for a private-sector job. "He came in, 36 years old, wonderful, energetic, eager to learn," Pynn says.

"He has 6,000 personnel under him, and we have an $11 billion capital program. He inherited an enormous amount of progressive infrastructure that has made New York City unique, in that we're always thinking 100 years down the road. This is not about fixing today's or tomorrow's problems; this is about expanding and making sure that New York City stays at the top in water and wastewater conveyance.

"Caz really made an effort to learn about and understand all the major projects. He paid special attention to Newtown Creek, and I was very proud of the interest he took. He even brought Mayor Bloomberg around on Christmas morning two years ago to meet the troops. It was heartwarming to hear the mayor being appreciative of the people who have to work at odd times, when everyone else is enjoying themselves, to keep New York City environmentally safe."

ON TOWARD COMPLETION

As he contemplates the rest of his career, Pynn looks forward to seeing the balance of the Newtown Creek upgrade put into service. "I'm very amazed, and so are some of the designers, at the level of treatment we're able to attain with only two-thirds of the facility finished," he says.

"In November, we're going to put the first half of the last third of our new treatment facility online. I want to see the completion of the entire treatment process and see the maximum efficiency this plant can attain. We average in the low 90s in percent removals now, and it's amazing to imagine we can get better — but we think we can." **tpo**

more info:

Rockwell Automation
414/382-2000
www.rockwellautomation.com

 By Scottie Dayton

Improved capacity and space savings

Problem

The 3.15 mgd (design) treatment plant in Marseilles, Ill., averaged 1.25 mgd and produced 55 dry tons of biosolids per year. Increased solids production taxed the capacity of the drying beds, which took two to six months to dry in ideal conditions. Aerobic cake averaged 17 to 19 percent solids and anaerobic 20 to 24 percent. "The cake had to be stored for three years before land-applying it," says Don Christensen, wastewater superintendent. "We were running out of storage options and needed more dewatering capacity, but had no extra space for it."

Solution

The city installed a **900/2000CV two-channel expandable rotary press from Fournier Industries.** Biosolids are fed at low pressure into a 36-inch channel between two parallel filters. As water drains away, solids collect against the outlet gate. The slow rotation produces enough backpressure to dewater the remaining solids and extrude dry cake. More dewatering modules can be added as the need arises. The press is low maintenance and energy efficient.

RESULT

The plant now uses the drying beds for storage. "The press has improved our biosolids process by leaps and bounds," says Christensen. "The best thing is, once we start the press, we can leave it unattended. It automatically adjusts to changes in the material." **418/423-4241; www.rotary-press.com.**

Frontline protection

Problem

To meet regulatory limits for total nitrogen and phosphorus, the Borough of Mifflinburg, Pa., asked the engineering firm of Herbert, Rowland & Grubic to evaluate upgrades for its aging wastewater treatment plant. A membrane bioreactor was selected and new screening equipment would be required to ensure successful operation.

Solution

Effective screening is a concern with MBRs as membrane fouling from suspended solids can damage membranes, decrease efficiency, and dramatically increase lifecycle costs. A dual-stage screening system was designed and installed that included one **Mahr bar screen with 6 mm openings and two Eliminator band screens with 2 mm openings from Headworks Inc.** The dual-stage process prevents the buildup of materials on the fine screens, since larger solids are removed in the first step. Ultimately, there are two lines of defense at the head of the plant. Screenings from both systems are compressed by two Screwpactor units. A shafted screw feeds material into the sieve zone, which allows free water to drain. Solids then move through a wash zone to reduce organic content before being compacted and sent through a discharge tube for additional dewatering.

RESULT

"The screens affect the efficiency of the entire facility," says Steve Benner, Borough Project Manager. "Their overall performance has been stellar." **713/647-6667; www.headworksusa.com.**

Energy recovery system

Problem

The Buffalo (Minn.) Wastewater Treatment Facility faced rising costs to manage aerobically stabilized biosolids, odor issues, and an increase in volume through population growth. Plans to upgrade the plant included a more efficient way to meet the EPA 503 Class A biosolids standards within a limited footprint.

Solution

The facility chose the **BioCon dual-belt biosolids dryer and energy recovery system (ERS) from Kruger.** The unit uses convection temperatures of 175 to 350 degrees F to evaporate water from biosolids, reducing the mass by 95 percent. The solids are then fed into a furnace that returns 80 percent of the heat to the drying process.

RESULT

The system increased the facility's biosolids capacity to 1,850 tons of dry solids per year, fit in a small footprint, and met Class A requirements. **919/677-8310; www.krugerusa.com.**

Confined-space screen solution

Problem

A malfunctioning comminutor in the influent pump station of the Oostburg (Wis.) Wastewater Treatment Plant caused clogging throughout the treatment process. The narrow building has a short inlet channel with the comminutor pit in the middle. Screenings are lifted 20 feet to the operating floor for disposal. The comminutor underwent frequent repairs, and the city wanted to replace it with a fine-screening device.

Solution

The engineering consultant considered stair screens, band screens, climber screens, and in-channel drum screens, but none fit without major modifications to the structure. He finally found the **ROTAMAT RoK 4 screen from Huber Technology,** which occupied one square yard in the comminutor pit. The unit vertically lifts the screenings while washing and dewatering them, then compacts and deposits the material in a continuous plastic bagger to eliminate odors. The screen is cleaned automatically.

RESULT

The plant has had no further clogging problems. **704/949-1010; www.huber-technology.com.**

Enhanced performance and odor control

Problem

The York (Pa.) Wastewater Treatment Plant needed to expand its sludge thickening capabilities before anaerobic digestion but was concerned about odor control and meeting York City Sewer Authority requirements.

Solution

The engineer specified two thickeners, each processing 240 gpm at 2 to 3 percent dry solids. Polymer was restricted to 8 pounds neat per ton of dry solids, and the thickened sludge was to be 4 to 6 percent solids. York purchased two enclosed **GSCE Gravabelt gravity belt thickeners from Komline-Sanderson.** Polymer-conditioned material diluted 0.5 to 1.0 percent is introduced at the feed end of a moving horizontal filter belt. The Roto-Kone high-rate drainage system holds back the solids while causing constant movement throughout the sludge blanket, allowing optimal drainage of free water. The discharged material is pumpable.

RESULT

When the system went online, the primary and waste activated sludge were at 1.1 percent solids. This, and limiting downstream capabilities, forced operators to adjust the units to thickened sludge at 6 percent dry solids at a feed rate of 195 gpm using 1.1 pounds of neat polymer per ton of dry solids. The system enhanced performance and odor control. **800/225-5457; www.komline.com.**

Deragging solution

Problem

The Arbennie Pritchett Water Reclamation Facility in Okaloosa County, Fla., installed **Aqua Guard perforated plate Model PF bar screens with 0.25-inch openings from Parkson Corp.** The self-cleaning, in-channel fine screens automatically removed suspended solids from the flow, but soon after their implementation, the paddle blade mixers in the oxidation ditches began accumulating rags and tripping out on overload. Operators had to clean the blades daily.

Solution

When contacted by the contractor, Parkson sent a team to investigate how the material entered the plant. They discovered that the fibrous components in large rags were small enough to slip through the openings in the plates. The team modified the screen's sealing mechanism to optimize it, then added a variable-frequency drive control to capture the tiny fibers. Parkson controls experts also designed a strategy based on ultrasonic differential level measurements. The system started the screens at 20 Hz, one-third the normal speed, then slowly ramped up speed as demand increased.

RESULT

The plate screen captured the small fibrous components, eliminated a scum layer in the headworks channel, and ended the rag problem. **954/935-6237; www.parkson.com.**

(continued)

Cleaning dewatering belts

Problem

Clogging belts on the two gravity belt thickeners at the Cowlitz County (Wash.) Three Rivers Wastewater Treatment Plant extended run times, reduced machine efficiency and belt life, and increased maintenance costs. Operators washed the belts to restore function and occasionally removed them for high-pressure cleaning to dislodge materials, but the fix was only temporary.

Solution

The facility tested the **Belt Blaster spray system from GillTrading.com.** Within the first few revolutions of the belt, the waterjet removed all materials, and operators saw the spray penetrating the fabric. The cake was consistent and within the anticipated range. When the system was turned off, the belt fouled after a few revolutions with water flowing over it.

RESULT

The spray system optimized liquid removal, increased belt longevity, and eliminated manual belt cleaning. **866/447-2496; www.gilltrading.com.**

Cold-weather composting

Problem

The Ishpeming (Mich.) Area Joint Wastewater Treatment Authority faced increasing costs to landfill biosolids. Land application of Class B biosolids is limited in Michigan's Upper Peninsula. Because of the cold and snowy weather, the authority turned to in-vessel composting to make a Class A biosolids product.

Solution

Engineered Compost Systems (ECS) provided an SV Composter stationary in-vessel system. It provides automated aeration control, monitoring and data recording, insulated concrete vessels and doors, leachate and condensate collection, and biofiltration of all process gases for odor and VOC reduction. The company worked with the authority's consulting engineers to fast-track construction.

RESULT

The facility was finished in February 2010, and the first batch of finished product was sold to commercial and residential customers that spring. With few glitches, the authority went from a costly landfill problem to saving money and providing a valuable product to the community. **206/634-2625; www.compostsystems.com.**

Increased solids handling capacity

Problem

The 13.8 mgd (design) Gloversville-Johnstown (N.Y.) Joint Wastewater Treatment Facility treats domestic flows as well as numerous industrial waste streams. These streams contribute to high influent BOD and have been growing for five years, increasing the solids to process and dewater, according to George Bevington, plant manager. Solids have been difficult to handle and dewater because of high concentrations of dairy whey. A pair of 2-meter belt presses could not keep up.

Solution

Two model **3DP Belt Presses from BDP Industries** replaced the 2-meter units and dramatically increased solids throughput and capture. The 2.5-meter units use an independent gravity belt and a vertical pressure zone to optimize dewatering. Open construction simplifies maintenance and operation. A pair of 2.5-meter gravity belt thickeners from BDP thicken waste activated sludge before the anaerobic digesters and extend solids residence time in the digesters.

RESULT

The belt presses dewater 150,000 and 230,000 gpd of 3 percent solids material, resulting in 100 wet tons of biosolids. The previous presses were limited to 38 to 40 gpm per meter of belt width. Each new press handles 55 to 60 gpm per meter of belt width, or up to a dry ton per hour. Higher solids throughput and improved solids capture reduce the solids "recycled" back through the process, improving the performance of the entire plant. The thickeners have boosted solids concentration to the digesters, improving their efficiency. **518/695-6851; www.bdpindustries.com.**

Dewatering in a small footprint

Problem

Drying beds were not keeping up with demand at the 5.75 mgd Lancaster (S.C.) Wastewater Treatment Plant, and the storage area reached capacity in 1.5 months. Haulers transported 6 million gallons of liquid biosolids in 1,200 trailer loads for land application. The facility needed a dewatering option that did not require a full-time operator and could handle a plant expansion to 7.5 mgd.

Solution

The city bought a **rotary fan press from Prime Solution.** Conditioned sludge feeds into the enclosed slow-moving (less than 1 rpm) dewatering channel between two rotating circular parallel stainless steel wedge wire screens. A pressure drop forces liquids through the filter openings. The dewatering process intensifies as the cake advances toward the tapered outlet, where a pneumatic restriction plate controls pressure. The compression from the plate, the backpressure from incoming biosolids, and the frictional force of the screens condense the cake to release additional filtrate.

RESULT

The press runs constantly with minimal supervision and is less labor intensive than the drying beds. Cake is 16 to 22 percent solids, allowing Lancaster to store six months of production. Paying $22 per cubic yard for transportation instead of 3.5 cents per gallon saves the facility thousands of dollars annually. **269/673-9559; www.psirotary.com.**

Pumps decrease downtime

Problem

The Kelowna (B.C.) Wastewater Treatment Plant used progressive cavity pumps to pump dewatered biosolids at 21 percent solids from two centrifuges 260 feet to ports discharging into trucks. The material, 132,000 pounds per day, was incinerated. Maintaining and replacing the pumps twice a year was not cost-efficient, and downtime stopped the process for three or four hours at a time.

Solution

Schwing Bioset engineers suggested two **KSP 45V(HD)L sludge pumps and an SD 250 screw feeder.** They also decided to keep the existing Schwing Bioset KSP 17V(K) in operation, playing a backup role for the new pumps.

RESULT

The decrease in downtime saved the plant time and money. It now ships Class B biosolids to the OgoGrow Production Facility to become a soil conditioner. **715/247-3433; www.schwingbioset.com.**

Continuous-feed biosolids dryer

Problem

In 2006, the 2 mgd advanced secondary treatment Sanford (Fla.) South Water Resource Center added a natural-gas-heated batch process dryer to produce Class A biosolids. When the price of natural gas rose to historic highs, the agency considered cost-effective alternative solutions that allowed for projected growth.

Solution

MaxWest Environmental Systems in Sanford installed an **IC 5400 Bio-Scru dryer from Therma-Flite.** The fully automated dryer has a true continuous-flow process, feeding 77 to 89 wet tons per day and discharging 1,080 to 2,077 pounds of dry solids per hour and 6,480 to 7,477 pounds of water per hour. The screw rotor design maximizes thermal efficiency by dewatering the material through the drying process. The solids are then burned in a 10 MMBtu heater, fueling the drying process and replacing natural gas. A programmable logic controller ensures uninterrupted operation with minimal operator attention, while continuously meeting federal 503 Class A requirements.

RESULT

The technology reduced the plant's overall costs and will capture an estimated $12 million in savings over the life of the contract. **707/747-5949; www.therma-flite.com.** tpo

Toxic Shock

HERE ARE WAYS TO FIND OUT IF YOUR PLANT PROCESS HAS BEEN AFFECTED BY SOME KIND OF TOXIC WASTE STREAM — AND SOME THINGS YOU CAN DO ABOUT IT

By Ron Trygar, CET

PHOTO COURTESY RON TRYGAR

Operators receive training on the use of phase contrast microscopes.

The operators of the Sunbelt Wastewater Treatment Plant arrive for their day shift and notice an unusual odor around the grounds.

After a morning briefing with plant personnel about daily duties, the chief operator (Joe) and shift operator (Bob) head out to investigate. They find an unusual sight: foam billowing in the aeration tanks and a very noticeable sour, chemical-like odor.

The clarifiers also look odd: Clouds of solids are rising and extending throughout the water, and the normally clear supernatant now has a greenish, turbid appearance. Large, irregular floc particles can be seen going over the effluent weirs.

COMPARING SOLUTIONS

Joe and Bob agree the plant looks sick, but not on how to correct the problem. Bob thinks the aeration dissolved oxygen (DO) should be increased and the waste sludge rate should be greatly increased to wash the "infected" biomass from the system, followed by reseeding with mixed liquor suspended solids (MLSS) from another treatment plant. He says there is enough digester capacity to waste solids into, and enough ability to dewater and haul away the cake sludge.

Joe considers Bob's ideas for a moment, and then recalls some training they recently had about activated sludge process control and troubleshooting. During the course, they learned about using various process tests to help determine effective solutions for situations like this.

Joe instructs Bob to collect some samples and meet him in the lab. There, Joe asks the technician to help with the additional process control tests he wants to run. During normal plant operation, the operators run settleability tests, a centrifuge spindown on the mixed liquor, and analysis for DO, pH, turbidity and total chlorine residual.

Today Joe asks for two more tests: a microscopic exam and an oxygen uptake rate (OUR) test. While out collecting samples for lab testing, Bob checks the aeration tank DO and finds a very high level — well over 5.0 mg/l. He reports this finding to Joe while bringing in the samples.

VALUABLE TESTS

The benefits of the OUR analysis and the microscopic exam as part of routine plant operation process control cannot be over-emphasized. These tests can be viewed as a health checkup for wastewater treatment facilities. Although every plant is different, each plant has its best operating set points. By gathering as much data as possible to learn how the plant runs at its best, an operator can make changes to bring the plant back into compliance when things seem to go wrong.

What's Your Lab Story?

The Lab Detective feature in *TPO* will help operators learn analytical techniques that help diagnose and solve treatment problems. Are you struggling with a process issue?

Send a note to editor@tpomag.com. Your question may become the topic of a future column.

An OUR test measures the amount of oxygen (in mg/l) that a sample of MLSS uses per hour. A calculation is done to get the final result as milligrams of oxygen per liter per hour (mg O2/l/hr). When a treatment plant is running optimally, the amount of oxygen used by the bacteria to stabilize the wastewater is normally much higher at the inlet end of the aeration tank than at the outlet.

This demand for oxygen by healthy aerobic microorganisms is high where the food supply is the highest and the bacteria are actively consuming BOD. The oxygen demand lessens as the flow reaches the end of the aeration tanks before entering the clarifiers, by which point almost all of the BOD has been consumed.

The benefits of the OUR analysis and the microscopic exam as part of routine plant operation process control cannot be over-emphasized. These tests can be viewed as a health checkup for wastewater treatment facilities.

However, when a treatment plant is upset, the OUR test may have different results. In the case of an abnormally high organic load entering the plant, the outlet OUR might be as high as the aeration inlet OUR, indicating that increased amounts of BOD are exiting the plant. More treatment time, more DO, or both may be required.

If the treatment plant has experienced a toxic batch of influent, as Joe suspects, the OUR test result would likely be very low at the aeration inlet and outlet. In this case, the aerobic bacteria are inhibited by the influent waste stream, or even dead, consuming very little oxygen. The DO test Bob ran while collecting samples confirms this theory.

A CLOSE LOOK

A microscopic exam is another great way to do a checkup of the biomass. If done on a routine basis — say, once or twice a week — it can help operators predict a negative change in operation and make adjustments before effluent quality deteriorates.

Some of the protozoa we rely on to indicate the degree of treatment are very sensitive to toxic loads, which could be from heavy metals, high influent ammonia, pesticides, herbicides, formaldehyde, or many of the other thousands of chemicals we use in our households and commercial establishments.

The Sunbelt lab analyst sets up several wet-mount slides for the operators to view. Using some of today's technology, the lab's new microscope has a built-in LCD screen so multiple people can view the slides at the same time.

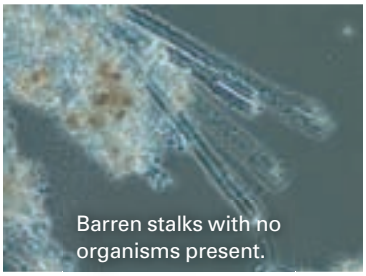


PHOTO COURTESY OF TONI GLYMPH

Barren stalks with no organisms present.

The observation is telltale: The stalked ciliates that normally dominate the mixed liquor are now missing. Remnants of stalk ciliate colonies are now seen as just the stalk itself — no individual animals living at the ends of the branches. An obvious lack of free-swimming ciliates, particularly the crawling species, and a lack of rotifers indicates something major has shocked the microlife.

PHOTO COURTESY RON TRYGAR

Examples of the tools used in oxygen update rate (OUR) testing include a YSI oxygen meter, timer, stopwatch, and a Barnstead/Thermolyne (Thermo Scientific) scale.

The previous micro exam, done about one week ago, showed a very healthy, active and mixed population of all the above microorganisms. Today's results show very little activity and small, dispersed floc particles with much 'debris' all around the floc. The operators also observe noticeable reduction of filament bacteria.

WHAT TO DO?

Joe and Bob sit down to review the data they've collected. It appears that the treatment plant has suffered a toxic shock load that has killed most of the bacteria required for treatment. What to do next?

If this happens to your plant, the first thing to do is notify all applicable regulatory authorities. Depending on the severity of the shock load, the treatment plant could be in violation of its discharge permit. Notifying local, state and federal authorities of the abnormal plant operating condition is critical, and usually mandatory, especially if the effluent quality has been affected.

Next, an action plan should be agreed upon and implemented.

Wastewater treatment facilities sometimes suffer from events like those described above, and it's imperative to have a plan to get the plant into compliance as quickly as possible. In the case of a toxic shock, here are some suggestions that can help the facility recover:

1. Make sure the toxic stream is not still flowing into the plant. If it is, collect samples of the influent in various containers, plastic and glass. Contact your laboratory and describe what is happening. They will recommend sample amounts and preservatives if needed. Record the time, date, location and the sample collector's name or initials when grabbing the samples.

2. If the influent appears normal, reduce the waste sludge flow rates or stop wasting altogether. The idea is to retain as many solids as possible and begin rebuilding the biomass.

3. Keep the return activated sludge rate high and maintain aeration DO levels at 1.0 to 2.0 mg/l.

4. Consider returning some waste sludge from an aerobic digester if possible to build up biomass. Alternatively, reseed with fresh return sludge from another treatment plant. Monitor the plant health and run process control tests to observe the recovery.

If your facility routinely suffers from frequent toxic influent waste streams, the source of the pollution should be located and stopped. A pretreatment program can help locate the culprit, and may be required by regulatory authorities. The deliberate dumping of chemicals toxic to treatment plants is a violation of the federal Clean Water Act and can easily contaminate receiving waters.

ABOUT THE AUTHOR

Ron Trygar is senior training specialist in water and wastewater at the University of Florida TREEO Center and a certified environmental trainer (CET). He can be reached at rtrygar@treeo.ufl.edu. **tpo**

Mobile Dewatering Solutions

Tractor Trailer Unit H&A Resource Mgmt.
Verssailles, KY Tel: 859-873-3331

Pick-up Compatible Unit

MSD Environmental
Centerville, OH Tel: 937-313-9314

Skid Mounted System Thunder Bay Casino
Sacramento, CA Tel: 209-483-4118

BDP Industries' mobile Belt Press Units have the following advantages:

- Waist level operation
- High discharge directly to truck
- Easy maintenance and cleaning
- Strong, galvinized tubular frame

Industry References: Synagro Inc., MSD Environmental, Blue Heron, Parker Agg, LWI, Inc.

weftec 2011
Booth 1967

BDP INDUSTRIES
www.bdpindustries.com

Contact: kelly@bdpindustries.com **Sales:** 518-527-5417 **Fax:** 518-695-5417 **Factory:** 518-695-6851

The biosolids dewatering building at the Clark County Water Reclamation District. (Photography by Ronda Churchill)

Always *On Track*

A HIGHLY AUTOMATED DEWATERING AND TRANSFER FACILITY PROVIDES STATE-OF-THE-ART BIOSOLIDS PROCESSING FOR THE CLARK COUNTY WATER RECLAMATION DISTRICT

By Doug Day

A NEW CENTRIFUGE DEWATERING FACILITY IS UNIQUE in both design and operation and will help the Clark County (Nev.) Water Reclamation District meet future demands, produce higher-quality biosolids, simplify dewatering and truck loading operations, and reduce operating costs.

The $125 million dewatering project, constructed by MMC, Inc. went online in May 2010 to replace recessed-chamber filter presses, which were reaching their end of life and were operating at capacity. "The district wanted a process that could dewater 24 hours a day, seven days a week, with minimal operator attention," says Bruce Johnson, project manager for the designer, CH2M HILL. "While the facility is complex to accommodate a variety of operational scenarios, it is actually quite simple to operate."

At the heart of the new facility for the 150 mgd Las Vegas wastewater treatment plant are eight high-speed, 30-inch-diameter Andritz D7LL centrifuges that work much like the spin cycle on a clothes washer, according to Mark Binney, director of operations.

Water is separated from the solids as the centrifuge spins at 2,600 rpm. The water is returned to the headworks for further treatment, and the solids are stored for landfilling. The project is designed to process an average of 180 dry tons of biosolids per day with a peak capacity of 230 tons. Its unique features include:

- Automation to allow around-the-clock operation with minimal operational staff, and during unmanned shifts.
- Ability to dewater undigested primary and thickened waste activated sludge separately or blended.
- Polymer feed systems that allow for use of two different polymers at the same time, one for primary sludge and one for waste activated sludge.
- A fully automated and enclosed truck facility that loads a truck in about five minutes and minimizes the potential for spills.
- A two-stage odor-control system to minimize odors inside and outside.

OPERATIONS

Biosolids enter the centrifuges at 3 to 5 percent solids and come out at 24 to 38 percent solids, depending on whether they are separated or blended. "By separating the sludges, it is possible to reduce the amount of phosphorous sent back to the plant," explains Johnson. "When the sludges are separated, primary sludge can be dewatered to 36 to 38 percent solids and waste activated sludge can be dewatered to 22 to 24 percent solids. When the sludges are blended, it is possible to get 26 to 28 percent solids."

The old process could achieve about 26 percent solids, Binney notes, but it was much more labor intensive. The sludges were not treated separately, and trucks had to be loaded directly from the presses at the end of each cycle because there was no storage for dewatered cake.

profile

Clark County Water Reclamation District Wastewater Treatment Facility, Las Vegas, Nev.

FLOWS:	150 mgd design
TREATMENT LEVEL:	Tertiary (sand filters and UV disinfection)
TREATMENT PROCESS:	Biological nutrient removal
RECEIVING WATER:	Las Vegas Wash/Lake Mead
BIOSOLIDS PROCESS:	Centrifuge dewatering of raw primary and thickened waste activated sludges
BIOSOLIDS VOLUME:	45,000 dry tons/year (125 dry tons/day)
BIOSOLIDS USE:	Landfilling
WEBSITE:	www.cleanwaterteam.com
GPS COORDINATES:	Latitude: 36°6'43.88"N; Longitude: 115°2'25.02"W

Members of the Clark County Water Reclamation District dewatering facility include, clockwise from upper left, John Moore, mechanical technician 2; Bruce Johnson, principal project manager with CH2M HILL; John Edenburn, plant operations supervisor; Kelvin Spendlove, operations specialist; Jasper "Butch" Stout, mechanical technician 3; LaToya Blanche, operator; Kevin Forgione, operations technician 2; and Dan Guzy, operations specialist.

ABOVE: A Republic Services truck is filled with dewatered solids. UPPER INSET: Kevin Forgione, operations technician 2. LOWER INSET: A sample of dewatered cake.

INDUSTRY RECOGNITION

Clark County's dewatering facility was named the best civil/public works project in Nevada in 2010 by the Southwest Contractors Association.

The American Public Works Association also named it the Nevada Section Project of the Year in the environmental category.

Director of operations Mark Binney observes, "It really simplifies things for the operators so they can process 24 hours a day and have a very consistent biosolid. The waste haulers like the automatic truck-filling operation. It's also a very nice-looking facility. It doesn't look like an industrial facility. Our operators work very hard to minimize odors so that nearby residents are not affected."

"Operators have found that by blending the sludge, they can reduce the odors in the feed storage tanks. That eliminated the need to add ferric chloride and helps increase the loading rate to the centrifuges."

BRUCE JOHNSON

Operators have been able to improve the new system so that the centrifuges can take a higher loading than anticipated — about 5,000 pounds per hour — while reducing polymer use to 7.5 pounds per ton, about half of what was expected.

With treatment plant flows of around 100 mgd, the biosolids facility can meet demand with only two of the eight centrifuges, creating even more flexibility, extending equipment life, and reducing power costs.

In addition to these improvements, says Johnson, "Operators have found that by blending the sludge, they can reduce the odors in the feed storage tanks. That eliminated the need to add ferric chloride and helps increase the loading rate to the centrifuges. At the same time, it was found that only a small amount of ferric chloride, 0.7 gpm, is required in the water returning to the headworks to tie up phosphorous."

The dewatering facility's two 376,000-gallon storage tanks, polymer and chemical mixing and feed systems, dewatered biosolids storage, the truck

Dan Guzy, operations specialist, demonstrates sampling of centrate at the dewatering centrifuges (Andritz).

loading facility, and the odor-control system are all housed in a four-story building of contemporary design to blend into the surroundings. One challenge was the site, a mile from the treatment plant. A pump station transfers sludges to the dewatering facility.

FLEXIBLE AND EXPANDABLE

The system can operate automatically with some unique measurements, like total suspended solids in the sludge coming into the centrifuges and in the centrate going out. The measurements automatically trigger changes in the polymer feed to optimize the dewatering process even during unmanned operation. "When it comes to creating a good biosolids cake with minimal operator attention, it provides a great deal of flexibility," says Binney.

Two different polymers can be added at any of four locations to optimize the process. A testing facility helps the staff evaluate new polymers by testing them on only one centrifuge.

Stronger odors are treated through a two-stage process of packed-bed biotowers and organic media biofilters. More diluted odors from the truck loading bays can be treated with the biofilters alone. "It's very seldom that you smell odors outside the plant, and you smell them only in certain rooms inside the plant, such as in the truck loading bays during loading," says Binney.

TRUCK LOADING

The enclosed truck loading facility is also unique: Johnson describes it as being "as simple and automated as possible." A driver pulls into the bay, and the doors close automatically. The driver enters maximum load limits for the vehicle and is directed by signal lights to the hopper that is the most full.

The driver starts the loading process with a remote control and watches the truck fill on a monitor. When the load begins to reach the vehicle limit, loading is stopped and the total load amount is displayed. The door opens, and the truck is directed forward through an automatic tire wash to make sure no biosolids are tracked off site.

The improved dewatering process has reduced the volume trucked to the landfill by a local refuse hauler, and it also saves on tipping fees. Landfilling has been found to be the most economical disposition for biosolids in the Las Vegas area. The cost of hauling and landfilling is about $20 per wet ton.

In the future, as landfilling costs increase, it may become more feasible to reuse biosolids, such as for a soil amendment. The dewatering facility was laid out to minimize the impacts of adding a drying or pelletizing facility. The centrifuge feed tanks were designed so that they could be used as digesters for an energy recovery system.

The new dewatering facility provides a sound biosolids management solution today, with flexibility for even better things in the years ahead. **tpo**

more info:

Andritz Separation, Inc.
800/433-5161
www.andritz.com

CH2M HILL
888/242-6445
www.ch2m.com

Every day is Earth Day.™

"We're met with a new challenge each day. Whether it's the sewer or water department, we're all cross-trained, and that means we can rely on each other for just about everything. We take our jobs very seriously, and the key thing is knowing that we're in compliance and not polluting our waters."

Jeff Chartier
An Original Environmentalist

SUPERINTENDENT
Town of Bristol (N.H.) Sewer and Water Department

PHOTOS COURTESY OF BISHOP WATER TECHNOLOGIES

The Eganville (Ont.) Sewage Treatment Plant and nutrient management facility. The domed structure is the greenhouse.

In the Bags

AN ONTARIO TREATMENT PLANT FINDS A COST-EFFECTIVE BIOSOLIDS DEWATERING SOLUTION IN FLEXIBLE AND PERMEABLE GEOTEXTILE TUBES

By Scottie Dayton

The Eganville Sewage Treatment Plant in Bonnechere Valley, Ont., paid $27,500 per year to handle 350,000 gallons of digested biosolids at 2.5 percent solids. In summer it was land-applied; in winter it was thickened, dewatered and hauled to the Robert O. Pickard Environmental Center (wastewater treatment plant) in Ottawa for storage and ultimately land application in spring.

To comply with pending provincial legislative restrictions on land-applying untreated sludge and septage, and to increase storage capacity to eliminate winter hauling, the County of Renfrew and Bonnechere Valley Township built a nutrient management facility across the road from the treatment plant.

After a pilot project to evaluate Geotube® dewatering units from TenCate Geosynthetics, officials chose the technology for the full-scale permanent facility. The flexible tubes are made of high-strength, permeable, engineered textile.

Darryl Verch, environmental officer for the township, runs the facility with two plant operators as part of regular duties. From June 2008 to January 2011, they dewatered 4,300 cubic yards of biosolids from the Eganville plant, 890 cubic yards of septage, and 670 cubic yards of biosolids from neighboring municipalities.

Andrew Polley, left, environmental project manager, and Dave Loader, Eganville Sewage Treatment Plant operator, evaluate the dewatered material from a TenCate Geosynthetics Geotube container.

In April 2010, Bonnechere Valley Township received the Exemplary Biosolids Management Award from the Water Environment Association of Ontario.

George Griffith of George's Septic Pumping in Eganville discharges digested sludge to the 10,000-gallon subsurface holding tank.

SIMPLE PROCESS

Bishop Water Technologies in Eganville provided information on infrastructure needs, process management, biosolids quality, and beneficial use opportunities. The facility's major components include a receiving area, subsurface holding tank, process control building, three 30- by 50-foot concrete dewatering pads with a greenhouse on one pad, and a filtrate storage tank.

Haulers deliver biosolids from municipal treatment plants and limited amounts of septage to avoid conflict with the nutrient management operation. They discharge septage into a chamber with a half-inch bar screen that connects to the 10,000-gallon concrete holding tank. Biosolids are pumped directly into the tank.

During offloading, a Purafil odor-control system from F.J. Nugent & Associates creates a negative pressure in the tank. Odorous air is drawn through a carbon-based filter before discharging through a vent to the outside. A direct line from the Eganville plant transfers digested biosolids to the tank (about 265,000 gallons per year).

A 5 hp Flygt submersible pump in the holding tank circulates the contents, producing a homogenized mixture. The staff collects samples

Share Your Idea

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

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

Filtrate from the dewatering process pours off a Geotube container.

to observe the condition of the liquid and to perform jar tests that determine how much Drewfloc 2445 polymer (Ashland Inc.) to add.

The make-down system mixes water with polymer concentrated at 0.4 to 0.8 percent in a 5,800-gallon tank. When the holding tank pump activates, a progressive cavity pump injects the polymer solution into the stream before it enters a manifold for additional mixing and reaction time. Then the chemically conditioned solution is pumped to one of six 30- by 46-foot GT500 Geotube units through a 4-inch hose with quick-disconnect fittings. It takes three to four hours to process an 8,000-gallon batch.

DRIP DRY

"As soon as a container begins to fill, clear, decanted water drains through pores in the textile, which retain more than 99 percent of solids," says Andrew Polley, environmental project manager.

The bottoms of the containment pads slope 1 percent to a trough that channels filtrate through underground piping to a 10,000-gallon concrete storage tank. When the tank is full, float controls trigger a 3 hp Flygt submersible pump that sends the liquid to the headworks.

Each containment pad holds two dewatering containers laid on top of mesh to promote drainage. The containers, which rise to 7.5 feet tall when filled with 132,000 gallons of conditioned liquid biosolids, take months to dewater. During the process, the staff submits samples to the provincial Ministry of Environment (MOE) Toronto laboratory for analysis. "Metals, pathogens, and nutrients have always been within MOE biosolids guidelines," says Polley.

A greenhouse enables dewatering to continue through winter. The structure has two heaters supplemented by solar heating, and a ventilation system to remove excess heat and moisture. "A significant portion of our cost is heating the greenhouse, and it fluctuates," says Polley. "The winter of 2008-09 was so cold that we added more heaters, but we had extended periods of mild weather and sunshine the next year."

A year after topping off a container, the staff opened it for a technology demonstration. "The outer layer was a dry friable brownish material, and the core more grayish," says Polley. "The biosolids, in the 10 to 30 percent solids range, loaded easily into a dump truck and had no significant odor." The material was applied to farm fields.

"As soon as a container begins to fill, clear, decanted water drains through pores in the textile, which retain more than 99 percent of solids."

ANDREW POLLEY

Dewatering, including equipment and labor, costs on average $17 or less per cubic yard, saving the township $8 per cubic yard or some $50,000 per year. The containers also provide more than a year of storage capacity, enabling the staff to supply the biosolids when the farmer needs them most.

Note: This article was complied from a report by Andrew Polley, environmental project manager, Township of Bonnechere Valley, Pembroke, Ont. **tpo**

Catalyst for Education

MAINE'S COORDINATED TRAINING PROGRAM DRAWS ON A HOST OF RESOURCES FROM THE WASTEWATER COMMUNITY AND FROM VENDORS, CONSULTANTS AND OTHERS

By Doug Day

With a staff of only two, you would think an organization responsible for training all wastewater treatment plant operators in a state would be stretched beyond the breaking point.

That is not the case in Maine, where the Joint Environmental Training Coordinating Committee (JETCC) depends on partnerships with plants, equipment and supply companies, regulatory agencies, and operators themselves to keep plant operators fully licensed and certified.

The success of JETCC shows in the 2010 Regional Wastewater Operator Training Provider Excellence Award its training coordinator Leeann Hanson recently received from the U.S. EPA. Hanson and administrative assistant Spring Connolly have the job of pulling together resources to develop and present training, keep records, process license applications, and administer twice-yearly testing.

Leeann Hanson (red jacket in the middle of the second row) poses with the 2010 graduating class of JETCC's Management Candidate School.

"One thing we keep talking about, in Maine and across the country, is bringing new people into the industry. There is an impending shortage. Within the next five to 10 years, a number of people will retire, and we need to develop a consistent, ongoing training program to recruit new people."

LEEANN HANSON

Hanson, who began her tenure with JETCC in 1992, talked about the award-winning program in an interview with *Treatment Plant Operator.*

tpo: What is the history of JETCC?

Hanson: It was formed in 1985 to help the state Department of Environmental Protection and the Maine Wastewater Control Association develop training and continuing education programs for wastewater treatment plant operators. The two organizations didn't have the resources to do it themselves, so JETCC was created as a nonprofit training entity. JETCC is administered through the New England Interstate Water Pollution Control Commission. JETCC is just one of NEIWPCC's many projects throughout New England and New York. NEIWPCC was established by Congress in 1947, and is one of the nation's original interstate compacts. NEIWPCC is well known throughout the region for its wastewater operator training programs.

I am the facilitator for JETCC, not a trainer. We rely on volunteers to do the training. They include municipal and industrial operators, regulators, consultants; pretty much anybody who works in the wastewater field could be tapped to teach a training class and share their expertise and professional knowledge.

tpo: How many classes do you offer?

Hanson: We offer 25 to 30 wastewater training programs every year, many of which are suitable for drinking water operators. We average more than 800 operators trained every year. I work with about 100 volunteers to teach, host, and facilitate the classes at various locations around the state.

Some of the programs involve multiple sessions, such as the two Basic Wastewater courses we offer every year. We offer 24 hours of instruction over six weeks in spring and fall. Each six-week course counts as one class.

We also help the state with the training it offers for erosion control, septic system installation, stormwater management, and environmentally friendly landscaping. Those classes reach another 1,500 people a year. We help publicize the classes to targeted audiences, process registrations, and following the model used with our wastewater classes, we package the registration material and certificates for the person hosting the class. When those classes are complete, everything is returned to us, and we circulate the information to the pertinent agencies.

tpo: Who develops the training material?

Hanson: Once a year, we have a brainstorming session where trainers, operators and interested parties share ideas. I'll work with individuals to develop a class out of the identified topics. For example, someone suggests something like blueprint reading, and then an engineering firm will work with their people to develop a six-hour class. Often a group of operators has solved a problem that still challenges others. Working together through JETCC, we structure their experience into a training session.

We may combine lab people from municipal plants and commercial laboratories along with a DEP regulator. Or maybe we'll put a couple of consultants together to teach a course for a day. JETCC works on packaging and advertising the program and will work with a local host, such as an operator at a treatment plant with a large conference room, who serves as the point person on the day of the class.

tpo: What is the format for training?

Hanson: It's mostly classroom, but we try to incorporate hands-on elements as much as we can. We have a manhole repair class that goes out into the field, works with the equipment, and goes through confined-space procedures. We've done pipe pigging classes where equipment is set up and a line is actually cleaned. A lab class may involve multiple stations with lab equipment.

One thing we've always tried to do is make sure we can empower operators to play a role in the training. Often somebody has a lot of expertise and wants to help but is nervous about speaking before a group. We would start that person as a volunteer host. The next time they may play a small role in a panel discussion. I've seen a number of people like that who eventually lead a class.

tpo: Do you see any gaps in wastewater training?

Hanson: The basic technical skills are always needed, like pump operations, standard lab procedures, and new regulatory issues. One thing we keep talking about, in Maine, and across the country, is bringing new people into the industry. There is an impending shortage. Within the next five to 10 years, a number of people will retire, and we need to develop a consistent, ongoing training program to recruit new people.

We've been teaching the six-week Basic Wastewater course each spring and fall for the last three years. It meets once a week and involves multiple trainers, multiple facilities, and tours different plants. That takes a fair amount of coordination. Hand-in-hand with that is training existing operators to move up to management positions, and developing ways to share institutional knowledge.

tpo: Those two are related to succession planning. What is JETCC doing in that regard?

Hanson: We started a Management Candidate School in 2009-2010 that we modeled after the Rhode Island Wastewater Operator Management Boot Camp (TPO, July 2009). We brought people in from all over the state to meet once a month for 12 months (October to September) to teach management skills. We had 17 people in our first class. Our second 12-month course started in October 2010 with 22 students and we've added drinking water operators. Roughly 40 industry professionals have assisted as trainers in these programs.

We also need to develop tools to document institutional knowledge so it can be passed on as people retire. There are a lot of people who have been in the industry for a long time who have knowledge in their heads. It's really hard to transfer that knowledge.

tpo: Is there anything else the industry needs to do to improve training?

Hanson: We have aging infrastructure and we need to educate the people who hold the purse strings — the general public and municipal officials — to understand that we must maintain infrastructure integrity. That's a real struggle, and we as an industry are probably missing opportunities to publicize the good work we do.

"As we know, education budgets are often the first to be trimmed. When you're looking at dollars and cents, people don't always realize how much information wastewater operators need to have in order to do their jobs."

LEEANN HANSON

tpo: Why do you think the EPA selected JETCC for special recognition?

Hanson: Thanks to the volunteers and everyone who helps us, I think JETCC is well respected in the industry and we are innovative. There are many examples of partnership, collaboration, and a willingness to take risks with new topics. We're also doing a lot on very little funding; it's all but been eliminated. Still, we provide a quality product and there is a lot of ownership for JETCC from people in the field.

tpo: What obstacles do you find in presenting effective training?

Hanson: Probably the biggest is the size of our state. It's such a distance from north to south; somebody always has to travel. For a municipality that's letting an operator off work for a day, that great class may be four hours away, so it's going to involve travel, and perhaps an overnight stay.

Some of the unique classes may involve multiple speakers, and it's hard to get those classes out to the farther reaches of Maine because the trainers have to travel three or four hours. As we know, education budgets are often the first to be trimmed. When you're looking at dollars and cents, people don't always realize how much information wastewater operators need to have in order to do their jobs.

tpo: Is there perhaps an answer to that in distance-learning technology?

Hanson: We haven't used that yet, but we're working on developing a distance-learning curriculum with our Basic Wastewater course. We still find face-to-face training has some qualities that are hard to match over the Internet.

It's not just the presentation time that is worthwhile to operators. It's also the conversations and camaraderie that develop within a group of like-minded people. That training class may be the one place where they get out of town and mix and mingle with other

operators facing the same challenges. They're so busy doing their jobs that they don't often have that opportunity.

tpo: What are the biggest changes in your years with JETCC?

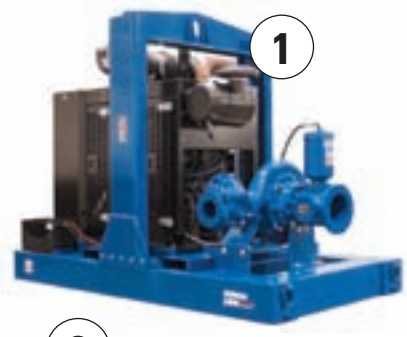
Hanson: The costs of producing and presenting training and the costs associated with attending training have gone up, while funding for wastewater training on a regional and national level has diminished significantly. We've started seeking sponsorships for portions of the classes. We started doing that last year and are doing it more intensely in 2011.

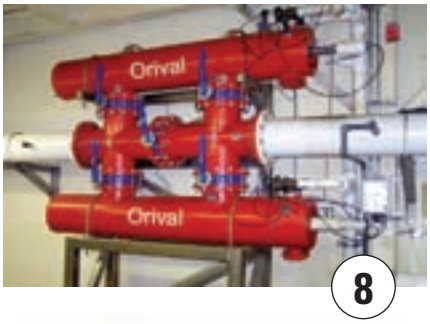
"Be prepared for anything and take as many courses as you can. There is always something to learn even if you don't see it as immediately related to your day-to-day operation."
LEEANN HANSON

tpo: What is your advice for operators when it comes to training?

Hanson: Be prepared for anything and take as many courses as you can. There is always something to learn even if you don't see it as immediately related to your day-to-day operation. Be open to public speaking, get involved in your community beyond your job, and put yourself in situations where you can talk about the importance of your work or just to get the experience of speaking.

There are a lot of opportunities in this industry to excel and move up, should you want to. For those who don't aspire to management positions, realize that what you are doing is making a significant contribution your community. tpo





1. GORMAN-RUPP INTRODUCES PRIME AIRE PLUS PUMP

The Prime Aire Plus line of priming-assisted pumps from Gorman-Rupp is available with up to an 8-inch flanged discharge, flows up to 4,950 gpm and heads to 475 feet. The pumps are designed for clear liquids and liquids containing large solids. **419/755-1207; www.grpumps.com.**

2. PALMER WAHL INTRODUCES SENSOR ASSEMBLIES

RTD and thermocouple sensor assemblies from Palmer Wahl Instrumentation are available in a variety of configurations and sensor heads, including aluminum, stainless steel, cast iron, polypropylene and explosion-proof models. Terminal blocks, data transmitters and thermocouple elements are available. **800/421-2853; www.palmerwahl.com.**

3. ECD OFFERS TOTAL NITROGEN ONLINE ANALYZER

The CA-6-14-A online analyzer from Electro-Chemical Devices measures total nitrogen in the range of 0-30 mg/l. Weighing less than 40 pounds, the analyzer can be wall-mounted or set on a bench. It is available with up to four channels (optional) each from a separate sample point. In addition to total nitrogen, the unit uses photometric differential absorbance to analyze over 20 other common parameters, including aluminum, silica, phosphate, iron and sulfate. **800/729-1333; www.ecdi.com.**

4. NILODOR INTRODUCES SUPERSOCK DEODORIZER

The odor-fighting superSOCK from Nilodor Inc. eliminates odors in sewers, roll-off containers and wastewater treatment plants for up to 60 days. An alternative to para block, the 100 percent corncob sock is saturated with Nilodor concentrated deodorizer. Each sock deodorizes an area up to 650 square feet. Fragrances include original, cherry and citrus. **800/443-4321; www.nilodor.com.**

5. OLDHAM INTRODUCES MOBILE ALARM CONTROLLER

The Mobile Perimeter System (MPS) IV mobile gas-monitoring platform from Oldham can be rapidly deployed for temporary or remote gas detection. The solar-powered unit has an onboard strobe and siren. The stand-alone system can monitor up to four gas readings and simultaneously transmit those readings wirelessly back to a primary alarm station. **800/338-3287; www.oldhamgas.com.**

6. ROCKWELL ADDS ETHERNET/IP TO MOTOR CONTROL CENTERS

Ethernet/IP-enabled motor control centers from Rockwell Automation enable users to access information remotely for safe monitoring, troubleshooting and diagnosing of the unit without exposing personnel to potentially dangerous conditions and power equipment. **262/512-2291; www.rockwellautomation.com.**

7. ITT INTRODUCES UV DISINFECTION SYSTEM

The WEDECO Quadron ultraviolet disinfection system from ITT Water & Wastewater features the OptiCone flow diverter for performance independent of the inflow, low water headloss and small footprint. **704/409-9700; www.wedeco.com/us.**

8. ORIVAL OFFERS HEAT EXCHANGER WATER FILTERS

Water filters from Orival Inc. are made to protect heat exchangers and prevent the clogging of nozzles, tubes and other narrow passages by removing particles down to micron size from once-through and recirculating cooling water systems. Line-pressure powered, the self-cleaning filter requires no external power and does not interrupt system flow.

Available in 10 to 12,000 gpm models, the filter installs in any position. **800/567-9767; www.orival.com.**

9. HACH INTRODUCES DR 3900 BENCHTOP SPECTROPHOTOMETER

The DR 3900 benchtop spectrophotometer from Hach Co. features radio frequency identification and walks users through testing procedures to ensure consistently accurate results. The unit eliminates false readings by taking 10 readings of a prepared sample from different angles and removing outliers caused by scratches, flaws or dirt on the glassware. RFID allows for hands-free calibration updates and enables sample tracking. **800/227-4224; www.hach.com/spectrophotometer.**

10. CONERY INTRODUCES NON-MERCURY FLOAT SWITCH

The B8 environmentally friendly, non-mercury float switch for liquid control from Conery Mfg. can be used for control duty or pump duty operation in potable water, sewage and wastewater applications. The switch features a polypropylene shell and polyurethane foam filling, making it leak proof and impact resistant. It is available with normally open, normally closed or SPDT switches and comes in virtually any length of cable. It also is available with a 120-volt or 240-volt piggyback plug for pump duty. **419/289-1444; www.conerymfg.com.**

11. GENERAL MONITORS INTRODUCES IR400 GAS DETECTOR

The IR400 combustible point infrared ethylene gas detector from General Monitors offers dual FM and CSA performance verification, meeting FM 6310, FM 6320 and CSA C22.2 requirements. The unit has a fail-to-safe design for dependable performance. Heated optics eliminate condensation, and a dirty optics indicator helps discriminate between true alarms and maintenance needs. The detector continuously monitors combustible gases in the lower explosive limit range and provides a 4-20 mA analog signal proportional to the 0 to 100 percent LEL concentration. Using 4.8 watts of power, the detector also monitors supply voltage and optical path integrity. Electronics are contained in an explosion-proof housing for local processing. **800/330-9161; www.generalmonitors.com.**

12. ACCUSONIC OFFERS TRANSIT-TIME FLOWMETER

The Model 7720 transit-time flowmeter from Accusonic Technologies addresses difficult installation requirements common to large UV disinfection systems. The maximum 10-path capability allows the meter to measure accurately, even with distorted flow profiles common to large UV installations. Measurable pipe and channel sizes range from 8 inches (200 mm) to 600 feet (180 m). Utilizing multiple-path, chordal, transit-time technology, achievable accuracy is ± 0.5 percent in full pipes and ± 2.0 percent in partially full pipes and channels. **508/273-9634; www.accusonic.com.**

(continued)

product spotlight

OPTISENS MAC 100 multiparameter converter from Krohne

Converter Combines Flow and Analysis in One Device

By Ed Wodalski

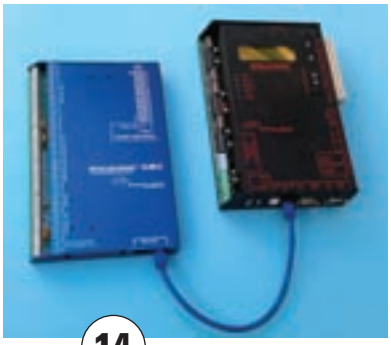
The OPTISENS MAC 100 multiparameter converter from Krohne, based on the long-standing IFC signal converter used for electromagnetic flowmeters, combines flow and analysis in one device.

With a familiar look, feel and configuration, the device allows quick commissioning, reduced training times and standardization of hardware. “Customers will find it very easy to use,” says Richard Lowrie, water and wastewater industry manager. “It’s got a straightforward menu structure and is designed to be robust and last a long time.”

Users specify the number and type of signal inputs and outputs and define the complexity of the measuring point and the number of parameters. A modular design offers flexibility in configurations, from cost-efficient single-channel converters to complex measuring systems.

The device is suitable for measuring such parameters as pH/oxygen reduction potential (ORP), free chlorine, chlorine dioxide, ozone, hydrogen peroxide, conductive conductivity, inductive conductivity, and dissolved oxygen. Regardless of which sensor is used or which parameter is measured, the device offers standardized startup and operation. Users can opt to measure two different parameters or connect two different sensors to one single converter, eliminating the need to install a second converter.

The unit’s self-cleaning chlorine sensors and compensation for cross-sensitivities ensure reliable data. The aluminum housing with IP66 category protection makes the device suited for external installation in harsh ambient conditions, including sedimentation tanks or sludge treatment units. **800/356-9464; www.krohne.com/northamerica.**



13. VAL-MATIC INTRODUCES CONTROL SYSTEMS

Control systems from Val-Matic Valve & Mfg. Corp. control butterfly, plug and ball valves equipped with cylinder actuators. Hydraulic and electric panels control the valves with air, oil or water power. Oil accumulator systems provide a clean, reliable oil supply to operate pump control valves, even after power outages. **630/941-7600; www.valmatic.com.**

14. LOGIC BEACH INTRODUCES DIGITAL I/O EXPANSION MODULE

The ILIM-2 digital I/O expansion module from Logic Beach Inc. connects to the IntelliLogger system base, adding event, counter and frequency inputs as well as additional outputs. Each module adds a mix of 16 event/counter input channels, two frequency inputs and 12 outputs. **619/698-3300; www.logicbeach.com.**

15. AMETEK OFFERS LIQUID LEVEL MEASUREMENT SYSTEM

The Level Mate III liquid measurement system from AMETEK PMT Products is designed for water and wastewater applications. It includes a stainless steel submersible hydrostatic sensor with cable and fully calibrated microprocessor-controlled digital meter with NEMA 4X enclosure. The factory-programmed device includes a two-line LED display meter with configurable function keys, engineering units, programmable 3A Form C relays, analog output, alternating pump control and 32-point linearization programs. Options include AC and DC, lightning and surge protection, additional relays, stainless steel support cable and choice of multiple sensors based on application requirements. **215/355-6900; www.ametekusg.com.**

16. BLUE-WHITE INDUSTRIES OFFERS CHEM-PRO METERING PUMP

The Chem-Pro C3 Series metering pump from Blue-White Industries has output/feed capability of up to 42.5 gph and a maximum working pressure of 175 psig. Features include a PVDF pump head, adaptors, ball valves and a priming/degassing valve built into the pump head. Other features include digital touch-pad control with backlit LCD display, variable-speed motor that can be adjusted from 1-100 percent in 1 percent increments. The pump has a powder-coated aluminum housing, rated NEMA 4X for wash down, and built-in leak-detection system. **714/893-8529; www.blue-white.com.** tpo

Vacon Builds Factory in China

Vacon built a manufacturing and development center in Suzhou, China. The facility covers 24,000 square meters (258,000 square feet) and includes a research and development lab and service center for the Asia-Pacific region.

Warren Rupp Holds SANDPIPER Distributor Meeting

The two-day Warren Rupp Inc. 2011 SANDPIPER Global Distributor Sales Conference attracted 150 attendees to Orlando, Fla. Presentations focused on new product development and marketing initiatives. The next conference is scheduled for 2013.

BASF Acquires inge watertechnologies AG

BASF has signed an agreement to acquire German-based inge watertechnologies AG and its ultrafiltration membrane business. Terms of the agreement were not disclosed. The transaction is expected to close in the third quarter of 2011.

Parkson, MIOX Form Partnership

Parkson and MIOX have partnered to market and sell MIOX's hypochlorite and mixed-oxidant systems to municipal water and wastewater customers in the United States, Canada and six Middle East countries.

NEFCO Promotes Grace to VP of Marketing

NEFCO promoted Virginia M. Grace to vice president of marketing and environmental affairs. She has 25 years experience in the environmental industry, including development, compliance and product marketing.

American Water Partners with Student Conservation Association

American Water has partnered with the Student Conservation Association in support of the group's national internship program that addresses water conservation, quality or advocacy across the company's service areas. The program is part of American Water's ongoing commitment to consumer education and environmental stewardship. It is among a series of initiatives the company is undertaking during its 125th anniversary in 2011.

Ruhrpumpen Acquires TIGERFLOW, Opens Middle East Office

Ruhrpumpen Inc. entered into an investment agreement to become the majority shareholder in TIGERFLOW Systems LLC. TIGERFLOW will continue operations at its Dallas manufacturing facility and will operate as an independent industry. Marvin F. Yoder Jr. and Monroe P. Guest will continue as president and vice president/CFO, respectively. Ruhrpumpen also opened a Middle East branch in Jebel Ali Free Zone, Dubai, United Arab Emirates.

McElroy Adds International Distributors

McElroy has added OPD Solutions of Norway and Gulf Services and Industrial Supplies Co. LLC of Oman to its network of international distributors. OPD is a distributor of polyethylene pipe in Norway, Sweden, Finland and Denmark. Gulf Services, a division of Arabia Holding Group KSC, is a supplier of industrial equipment for the wastewater, gas and oil industries.

Hydroflo Opens International, U.S. Plants

Hydroflo Pumps USA Inc. opened its sixth and seventh assembly plants in David, Panama, and Grand Island, Neb. The plants will assemble and distribute the company's line of vertical and submersible turbines.

Pump Solutions Acquires EnviroGear Product Line

Pump Solutions Group acquired the EnviroGear product line. Manufacturing and operations will be based in Grand Terrace, Calif. Product lines include EnviroGear mag-drive internal gear pump, EnviroBase gear pump base plate assemblies, and EnviroCare pump and motor protection and control products.

Thompson Pump Holds 21st Annual Pumpology School

More than 45 attendees from 16 states and two foreign countries attended the Thompson Pump & Manufacturing Co. 21st annual Pumpology School. The three-day workshop for sales and service professionals was held at the company's corporate facilities in Port Orange, Fla.

Degremont Completes AmeriWater Acquisition

Degremont, a subsidiary of SUEZ ENVIRONMENT, completed the acquisition of AmeriWater. Based in Dayton, Ohio, AmeriWater has 40 employees, an on-site service group and an in-house manufacturing facility. Diane Dolan will remain chief executive officer of the high-purity water production company. AmeriWater will be integrated into Degremont's Equipment Business Line, operating under the Degremont Technologies banner.

Greyline Adds Office, Warehouse Facility

Greyline Instruments, Ontario, Canada, completed construction of its office and warehouse facility in May. The 8,500-square-foot building is part of a multi-phase expansion that includes renovation of the existing manufacturing facility. Work is scheduled for completion this fall. Greyline designs and manufactures flow and level instruments for the water and wastewater industry.

Sumitomo Machinery Offers Aerator Input Requirements Paper

Sumitomo Machinery Corporation of America offers an eight-page white paper on aerator input requirements. The paper *(Aerator Input Requirements)* can be requested at www.tpomag.com/whitepapers/details/aerator_input_requirements. It includes project input requirements and the importance of aerator applications, getting the right application information and project requirements for the job, specifications and industry requirements, equipment specifications, unique operation conditions, application impact on gearboxes, properly selected gearboxes, options affecting selection and effects of improperly selected gearboxes. **tpo**

Bird Watching

By Ted J. Rulseh

Big birds have been regular visitors to the Upper Blackstone Water Pollution Abatement District's 52 mgd treatment plant in Millbury, Mass.

The tom turkey pictured here is one of a group that regularly patrols the plant grounds looking for food. The red-tailed hawk has made several appearances outside the plant administration building.

The great blue heron fishes in a final settling tank that served the plant before a major upgrade. It is home to shiner minnows that the bird craves. Sharon Lawson, pretreatment coordinator and laboratory specialist for the district, submitted these pictures. tpo

Show us your visitors

***TPO* invites you** to show us the wild creatures that visit your plant property. Mammals, birds, reptiles, amphibians — send a picture or two and a brief description of when and where the visitor appeared to editor@tpomag.com.

Scan the code with your smartphone:

Headworks/ Biosolids

By Pete Litterski

SLUDGE SCRAPING

ZICKERT Shark from WesTech Engineering

The ZICKERT Shark sludge scraping system from WesTech Engineering has concave forward faces to transport sediment toward a sludge pit. During the return movement, wedge-shaped rear faces slide under the sludge blanket, providing uninterrupted transport. The system is designed for rectangular tanks and lamella plate clarifiers and works in all sedimentation processes, including grit chambers. It can be powered by hydraulic or electric motors and can be pushed or pulled, allowing flexibility in drive location. **801/265-1000; www.westech-inc.com.**

MAXIMIZED BELT PRESSURE

Sentry Press from Charter Machine

The Sentry Press system from Charter Machine incorporates the company's tower press arrangement, giving each pressure roll a minimum of 205-degree belt wrap, maximizing time under pressure. The three-belt press has a low gravity deck, but its discharge point is more than six feet from the base to accommodate conveyors or auxiliary equipment. A center-pivot design adjusts both sides of the belt simultaneously, promoting even stretching. All bearings are self-aligning, double-roll, spherical-roller type and come with quadruple lip seals. An independent speed control for the gravity deck is well suited to thin feed solids. **732/494-5350; www.chartermachinecompany.com.**

BIOSOLIDS SPREADING

ProTwin Slinger from Kuhn Knight

The ProTwin Slinger side-discharge spreader from Kuhn Knight has a twin-auger design and is available in truck or trailer models. A free-swinging hammer discharge provides an even spread pattern. Each hammer swings down into the material, peeling it off, pulverizing it, and slinging it underhand. The hydraulically controlled lower pan seals the discharge area during road travel, keeping material off the road and blocking the area from public view.

The scale system can be combined with the Digi-Star NT 460 Nutrient Tracker system with GPS capability to allow precise monitoring and documentation of application rates and locations to help comply with EPA and DNR regulations. **608/897-2131; www.kuhnnorthamerica.com.**

Rotary screen from FKC Co.

ROTARY SCREEN

The rotary screen from FKC Co. is designed for continuous unattended operation in sludge thickening and influent fine-screening applications. Screen hole size and pitch are custom fit for the application, and multiple model sizes are available to handle flow rates up to 700-800 gpm for sludge thickening in a single unit and much higher flow rates for influent screening. The drum is supported and driven by a poly-coated shaft with stub ends, keeping all bearings outside the unit covers for easier and safer maintenance. External showers keep the screen holes clean. **360/452-9472; www.fkcscrewpress.com.**

REMOVING GRIT AND GREASE

Grit and Grease Removal System from Schreiber

The Grit and Grease Removal System from Schreiber performs over a wide range of flows. The system is designed as a rectangular concrete channel with two parallel chambers. Effluent enters the grit channel where coarse-bubble diffusers create a continuous roll in the liquid. The spiral circulation scours, washes and deposits the grit into the bottom trough of the channel. A grit pump removes settled grit, and the slurry then flows to a grit classifier for further washing and dewatering before disposal. Grease attaches to air bubbles that provide buoyancy. Air/water lances spanning the width of the grease channel create a surface current that continuously transports grease to a removal screw. **205/655-7466; www.schreiberwater.com.**

Sludge Mate from Flo Trend Systems

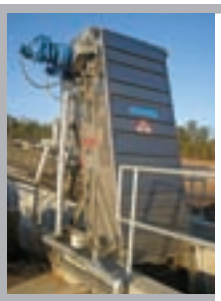
SLUDGE FILTERING

The Sludge Mate container filter from Flo Trend Systems is available in sizes from 3 to 60 cubic yards with dewatering capacities of up to 80,000 gpd. The tipping stands can be built for the application, such as dumping the cake into another container, into a dump truck, or onto a concrete three-wall pad. Walkways and handrails with ladders or stairways are available for cleaning and maintenance. A remote handheld control allows the operator to raise and lower the container for dumping accumulated cake and controls the opening/closing, locking/unlocking functions of the rear door. **713/699-0152; www.flotrend.com.**

GRINDING INLINE

EZstrip TR Muncher from NOV Monoflo

The EZstrip TR Muncher from NOV Monoflo protects downstream equipment from blockages while allowing quick and easy inspection and maintenance without the need to disconnect pipework. The complete cutter stack can be inspected and replaced on site within 2 1/2 hours. Installation can be made with inline flanges or the option of tanker coupling connections. Cutters are specified to 8.0-mm, 5.5-mm and 3.0-mm thickness to match the optimum particle size for specific process requirements. Capacity is up to 1,938 gpm on raw sewage and up to 1,453 gpm on 4 percent solids sludge. **281/200-1200; www.ezstrip.com.**



Aqua-Screen from Andritz Separation

HIGH-CAPTURE HEADWORKS SCREEN

The Aqua-Screen in-channel perforated panel traveling belt screen from Andritz Separation can be adapted for channel widths up to 10 feet, depths up to 42 feet and the maximum head differential required for the application. The screen can handle up to 175 mgd with a single unit.

The unit operates intermittently; forming a solids mat on the face of the step-shaped panels until a preset upstream level or differential level is reached, signaling the screen to rotate. Solids are removed effectively at the top of the unit by means of a high-pressure bidirectional spray wash and an independently driven cleaning brush. The solids are then conveyed and dewatered by a screenings handling system with a capture efficiency of up to 85 percent. **800/433-5161; www.andritz.com/es.**

ULTRAFINE FILTRATION

The Baleen filter from JDV Equipment removes materials between 5 and 500 microns before effluent reaches a treatment plant's membrane filters. The system does not require hot water to clean and is kept clear by a mechanism inspired by the Baleen whale. Before trapped suspended solids are allowed to accumulate and blind the screen media, high-pressure, low-volume sprays dislodge the material and sweep it away for collection. **973/366-6556; www.jdvequipment.com.**

Baleen from JDV Equipment

Dimminutor from Franklin Miller

AUTOMATIC SCREENING, GRINDING

The Dimminutor from Franklin Miller automatically screens and grinds wastewater solids in straight-through channels and wet wells. It reduces plastics, wood, rags and other solids to fine bits, improving the reliability of pumps and other downstream equipment. As its three bidirectional rotary cutters intermesh at close clearance with stationary cutters, solids are reduced to a size fine enough to pass through a sizing screen.

With no gaps or openings between the screen and cutters, output is controlled and complete reduction assured. The grinder's open design handles high flow rates with low headloss. It has individually replaceable cutters, and its cantilevered design eliminates seals or bearings near the gritty channel floor. **973/535-9200; www.franklinmiller.com.**

SLUDGE HEATING

The PSX inline sludge heater from ProSonix is designed for municipal, industrial, and food wastewater processing. There are no hot surfaces, eliminating problems with plugging and fouling. The inline design is suitable for high solids and difficult-to-pump fluids. The angled PSX jet diffuser eliminates rag issues. The steam injector's diffuser produces 360-degree delivery of the steam for more uniform heating. **800/849-1130; www.prosonix.com.**

PSX from ProSonix

BTH from seepex

CAKE PUMP SYSTEM

The BTH cake pump design from seepex allows flow rates up to 220 gpm at pressures up to 540 psi. An auger pushes the cake into the pumping element. The pitch, diameter and speed of the auger can be adjusted to match the application. A customizable open hopper along with system controls for dry running protection, load cell sensors, pressure gauge and boundary layer injection complete the system. The system has low capital, operating and maintenance costs and does not pulsate. A seepex MD range metering pump can be added to mix lime into the hopper to change the classification of the cake. **937/864-7150; www.seepex.com.**

GRIT PUMP

The PISTA turbo grit pump from Smith & Loveless is available in top-mounted vacuum-primed and remote-mounted flooded-suction configurations. It has a Ni-Hard volute and Ni-Hard recessed impeller, mounted completely out of the flow path of the abrasive fluid, with an oversized stainless steel shaft and bearings. The pump is available for both 4- and 6-inch arrangements. The top-mounted, vacuum-primed units eliminate excessive piping while lowering the head and horsepower. For suction-lift, the vacuum-primed units employ SONIC START Streamline prime sensing, which eliminates electrodes and reduces routine maintenance. **800/898-9122; www.smithandloveless.com.**

PISTA from Smith & Loveless

DEBRIS RAKING

The Deep Raker system from Fairfield Service Company is used upstream of a combined sewer overflow tunnel system's pumps to screen large debris. The system removes the debris from the bar rack while the rake is ascending. The rake, powered by vector motor control technology, grabs debris instead of pushing it down. It uses a traveling dead plate for debris capture and can function in shafts up to 350 feet deep. **219/872-3000; www.fairfieldservice.com.** tpo

CLASSIFIED ADVERTISING

AUGUST

BLOWERS

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

New Roots 27" 1021 PD blower. In stock, ready to ship or install. **www.VacuumSales Inc.com, (888) VAC-UNIT (822-8648).** (PBM)

CONSULTING/ENGINEERING

Meuth Systems Precision water leak detection services for utility districts across Texas. Residential testing within 75 miles of Austin. Phone: 512-450-4992. (o-01)

DEWATERING

20-Yd. Dewatering Filter Box: Complete rollover tarp system, filter media, loading manifold, drain ports and washout ports. interior epoxy coated, exterior polyurethane top coat., $18,000. Polymer system, $9,000. **Call for more info. 863-984-8994 FL.** (o08)

DEWATERING

4-year-old (2006) Lely Maximizer in great shape with 2 screens. $24,000. Call 1-866-362-7687 for more info. GA. (P09)

1200 mm Netzsch filter press for sale. Excellent condition. 70 plates, new drip pans, new replacement fabric. $65,000. For more info call or email shawnperry@klinesservices.com or 717-587-1927 PA. (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)

MISCELLANEOUS

UV DISINFECTION EQUIPMENT: Attention: Small wastewater treatment plant owners and operators. Very easy installation and affordable. Up to 17 gpm. Brand new product. US patent pending. **www.thefecalfighter.com.** 614-207-9030 or callagher@sbcglobal.net. (oBM)

CLASSIFIED AD FORM Treatment Plant Operator

$2.00 per word, per month. Please print ad legibly below with ***correct punctuation*** and ***phone number.*** Circle each word to be bolded, if any. ($2. 00 extra per bolded word)

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

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

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

CALCULATE THE AMOUNT DUE:

_____words X $2.00 = _____ X _____ Months = $_____
($40 minimum) (# of months to run the ad) Total Amount Due

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

COMPANY NAME: _____

ADDRESS: _____ PHONE: _____

CITY: _____ STATE: _____ ZIP: _____

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

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

CREDIT CARD NO.: _____ V-CODE: _____ EXP. DATE: _____

CARDHOLDER NAME: _____ PHONE: _____

We accept: VISA MasterCard DISCOVER

TREATMENT PLANT OPERATOR

tpo Marketplace Advertising

TPO invites your national, state or local association to post notices and news items in this column.

people/awards

Leonard Pompa of the Delta Diablo Sanitation District won the California Water Environment Association Gimmicks & Gadgets State Award for his invention, the TroughONator. The device ensures that grease scum stays in the settling basin and not on cleaning equipment, railings, walkways or operators' clothing or bodies.

The **New Holstein (Wis.) Wastewater Treatment Plant** received the 2011 Laboratory of the Year Award for small registered facilities from the Wisconsin Department of Natural Resources.

The **Newnan Utilities Mineral Springs Wastewater Treatment Plant** received the Georgia Association of Water Professionals Award for Best Operated Municipal Wastewater Plant of the Year.

Flint Hills Resources Pine Bend Refinery recently received a Minnesota Wastewater Treatment Facility Operational Award from the Minnesota Pollution Control Agency.

Gary Cornell, chairman/CEO of BLACOH Fluid Control (Riverside, Calif.), was honored by the Hydraulic Institute for his technical leadership and contributions in the creation of ANSI/HI Standards.

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

Kentucky

The Kentucky Water and Wastewater Operators Association has these courses:

- Aug. 17 – Confined Space, Bowling Green
- Aug. 18 – Confined Space, Beattyville

Visit www.kwwoa.org.

Massachusetts

The New England Water Environment Association has a Lab Practices and Microconstituents seminar in Lawrence on Sept. 14. Visit www.newea.org.

Michigan

The Michigan Water Environment Association has these courses:

- Sept. 8 – Collections, Bath
- Sept. 27-28 – Biosolids, Kalamazoo
- Oct. 25 – Health and Safety Seminar, East Lansing

Visit www.mi-wea.org.

New York

The New York Water Environment Association has these courses:

- Aug. 11 – Pumps, TBA
- Oct. 11 – Confined Space, Potsdam

Visit www.nywea.org.

North Carolina

The North Carolina-American Water Works Association has these courses:

- Aug. 11 – Back to the Basics, Greenville
- Sept. 20 – Safety, Clemmons

Visit www.ncsafewater.org.

Ohio

The Ohio Water Environment Association has a Plant Operations course in Lewis Center Sept. 21-22. Visit www.ohiowea.org.

Pennsylvania

The Pennsylvania Water Environment Association has these courses:

- Sept. 14 – Securing Wastewater Treatment Facilities, Camp Hill
- Sept. 22 – Securing Wastewater Treatment Facilities, Hamburg
- Sept. 23 – Securing Wastewater Treatment Facilities, Pittsburgh

Visit www.pwea.org.

Texas

The Texas Water Utilities Association has these courses:

- Aug. 9 – Pumps and Pumping, Carrollton
- Aug. 15 – Pumps and Pumping, Corpus Christi
- Sept. 12 – Safety, Corpus Christi
- Sept. 13 – Utilities Calculations, Carrollton
- Sept. 14 – Management, Corpus Christi
- Sept. 19 – Calculations, Corpus Christi
- Sept. 20 – Wastewater Collection, Victoria
- Oct. 11 – Wastewater Collection, Waco

Visit www.twua.org.

The Water Environment Association of Texas has a Capacity, Management, Operation and Maintenance: Proactive Approach seminar in Austin Aug. 11-12. Visit www.weat.org.

Wisconsin

The Wisconsin Department of Natural Resources has a Confined-Space Entry Hands-On Training seminar in Plover on Aug. 18. Visit www.dnr.state.wi.us/org/es/science/opcert/training.htm. tpo

CALENDAR OF EVENTS

July 31-Aug. 3
Water Environment Federation Energy and Water 2011: Efficiency, Generation, Management and Climate Impacts, Hyatt Regency McCormick Place, Chicago. Call 703/684-2441 or visit www.wef.org.

Aug. 1-2
Virginia Water Environment Association Annual GLP Conference, Omni Charlottesville Hotel. Visit www.vwea.org.

Aug. 30-Sept. 1
Kansas Water Environment Association and Kansas Section-American Water Works Association Annual Joint Conference, Capitol Plaza Hotel, Topeka. Call 785/357-4780 or visit www.kwea.net.

Sept. 14-15
Kentucky Water and Wastewater Operators Association Fall Conference. Visit www.kwwoa.org.

Sept. 15-16
New York Water Environment Association 2011 Science and Technical Conference, Hotel Thayer, West Point. Call 315/422-7811 or www.nywea.org.

Sept. 18-21
Pacific Northwest Clean Water Association Building Professional Excellence Conference, Hilton Vancouver (Wash.). Call 208/455-8381 or visit www.pncwa.org.

Sept. 18-21
Rocky Mountain Water Environment Association Annual Conference, Loveland, Colo. Visit www.rmwea.org.

Sept. 25-27
The Water Environment of Ontario National Residuals and Biosolids Conference, Centre des Congres, Quebec City. Visit www.weao.org.

Oct. 2-4
Atlantic Canada Water & Wastewater Association 2011 Annual Conference, Delta St. John's Hotel and Conference Centre, St. John's, Newfoundland. Visit www.acwwa.ca.

Oct. 4-7
Wisconsin Wastewater Operators Association Annual Conference, La Crosse. Visit www.wwoa.org.

Oct. 15-19
Water Environment Federation WEFTEC 2011, Los Angeles Convention Center, Los Angeles. Visit www.weftec.org.

The Only Company to Trust When You Require the Best in Water Quality Monitoring!

NEW FEATURED PRODUCT!

ATI's NEW Series Q46H Monitoring System simplifies documenting disinfectant residuals in water distribution systems. Providing continuous measurement of chlorine, pH and temperature, the monitor delivers all the data required for insuring compliance with disinfectant contact-time (CT) requirements. Three isolated 4-20 mA outputs are available for interface to DCS or telemetry systems. For digital systems, a Profibus communication option is available now, with Modbus and Ethernet systems available shortly.

FEATURES

- Chlorine, pH & Temperature in one, compact unit
- 3 SPDT relays standard
- Pre-assembled system panels available
- Option for 3 additional low power relays
- Profibus-DP, Modbus, or Ethernet communications

WASTEWATER MEASURING SOLUTIONS

DISSOLVED OXYGEN MONITOR
Model Q45D-ODO
Self-Cleaning DO System

FEATURES
Dissolved Oxygen Monitoring without the Maintenance
*Air-Blast Sensor Cleaning Insures Accuracy & Reliability
Save Power and Improve Aeration System Performance
Guaranteed Performance in Any Aeration Environment

DISSOLVED AMMONIA MONITOR
Model Q45N
Dissolved NH_3 Monitor

FEATURES
New Approach to Effluent Ammonia Measuring
Total Ammonia Measurement
Optional Sampling System with Auto Cleaner
4-20 mA Outputs & Alarm Relays

RESIDUAL SULFITE MONITOR
Model A15/66
Dechlorination Monitor

FEATURES
Continuous Monitoring Insures Complete Dechlorination
Reduces Chemical Usage by Allowing the Process to Operate at Low Sulfite Levels
Gas Phase Measurement, No Process/Sensor Contact
Low Maintenance Membraned Sensor

Visit us at Booth 2949
weftec 2011

800.959.0299 www.analyticaltechnology.com

Get the free mobile app at
http://gettag.mobi

SOME THINGS WORK BETTER TOGETHER.

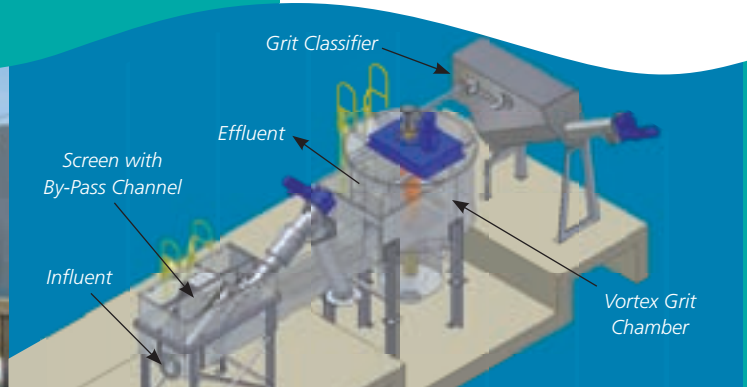
***Raptor* Complete Plant and H-Pac system combine the actions of two or more steps in a single unit.** Our *Raptor* Complete Plant combines screening and grit removal into one self-contained fully automated unit. It features a stainless steel tank and the *Raptor* Fine Screen, *Raptor* Micro Strainer, or the *Raptor* Rotating Drum Screen plus dewatering and transport screws in the grit removal chamber. An optional grease collection system can be included. Grease can be removed manually or by means of an added motorized skimmer.

Our H-Pac system combines our *Raptor* or Hydronic T Screening product line with our SpiraGrit Vortex Grit Chamber in an elevated pre-engineered headworks system. Capable of handling flows as high as 12 mgd, the H-Pac can be installed above or below ground and its compact design uses less space and costs less than other packaged systems. For more than 80 years, Lakeside has provided solutions for treatment plant designers and engineers—working better together!

Speak to one of our experts at 630.837.5640, email us at sales@lakeside-equipment.com, or visit www.lakeside-equipment.com for more product information.

LAKESIDE
EQUIPMENT CORPORATION
Water Purification Since 1928

Cleaner Water for a Brighter Future™



Package Headworks Systems

Raptor® Complete Plant
H-Pac®