

Pacific Northwest Clean Water Association

PNCWA

Newsletter
Winter 2011



**FEATURE FOCUS:
ENERGY & ENERGY
RECOVERY**

Starts on page 17

**CONFERENCE
HIGHLIGHTS**

Pages 12 & 38

**PNCWA2012 CALL
FOR ABSTRACTS**

Page 10

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Front row: Shannon Ostendorff, treasurer; Cyndy Bratz, president; Heather Stephens, secretary; Kay Hust, outgoing W WA regional director; John Shawcroft, past president; Doug Allie, outgoing WEF director; Max Hildebrand, WEF director. Back row: Gil Bridges, W WA regional director; Mark Poling, president elect; Andy O’Neill, past president; Ron Gearhart, Idaho regional director; Thomas “Bud” Ruther, outgoing E WA regional director; Tom Hastings, E WA regional director and Steve Miles, OR regional director
 Not pictured: Mike Ollivant, vice president and Rick Shanley, WEF director

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COVER PHOTO: COGENERATION FACILITIES AT THE COLUMBIA BOULEVARD WASTEWATER TREATMENT PLANT, BUREAU OF ENVIRONMENTAL SERVICES, PORTLAND, OREGON. TWO 800 KW INTERNAL COMBUSTION ENGINE-DRIVEN GENERATORS, EQUIPPED WITH LEAN-BURN TECHNOLOGY AND HEAT RECOVERY WERE HOUSED WITHIN A NEW BUILDING, WITH A 600 SCFM GAS CONDITIONING SYSTEM ON A GAS TREATMENT SKID OUTSIDE. THE INSTALLATION WAS STARTED UP IN 2008 TO PROVIDE 1.7 MW OF POWER. THE SYSTEM HAS REDUCED THE PURCHASED ELECTRICITY AT THE PLANT BY AS MUCH AS 40 PERCENT. Photo courtesy of CDM.

MISSION STATEMENT

Pacific Northwest Clean Water Association (PNCWA) is dedicated to preserving and enhancing the water quality in the states of Idaho, Oregon and Washington. We promote the professional development of our members, the dissemination of information to the public, and the advancement of science and technology needed to protect public health and the environment.

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PNCWA NEWSLETTER



To contribute an article, contact Sheri Wantland, 503.681.5111 or wantlands@cleanwaterservices.org. Submission guidelines are on pg. 35. Newsletter articles reflect the author's opinions and not necessarily those of the PNCWA Board of Directors or Water Environment Federation. The PNCWA newsletter is published quarterly, © 2011 Pacific Northwest Clean Water Association. Change of address inquiries should be directed to the PNCWA office.

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Energy and Energy Recovery



PNCWA President
Cyndy Bratz
Brown and Caldwell

Energy recovery was one of the themes of the WEFTEC workshop “Wastewater as a Re-N-E-W-able Resource: Nutrients, Energy, Water.” Presenters discussed recovery of nutrients, energy and water from wastewater. The idea is that “waste” water is really a resource, not a waste.

There are 12 wastewater treatment plants in Europe which are generating more power than they use. How do they do it? The technical answers—cogeneration, codigestion, heat recovery and other processes—are fascinating and exciting! Some treatment plants, including East Bay MUD in the U.S., are processing

post-consumer food waste from restaurants, grocery stores and food processing facilities in anaerobic digestion processes—taking codigestion and cogeneration to a new level. Supplemental waste streams used by codigestion facilities can increase digester gas production by up to four times as much biogas as conventional anaerobic digestion facilities. The biogas can be used for power, heat production or sold to a natural gas utility.

An enormous amount of thermal energy is lost when final effluent from a wastewater treatment plant is discharged to surface water. Oslo, Norway taps heat from the wastewater collection system with a heat pump and transfers this heat into a network of hot water pipes feeding thousands of hot water radiators and taps around the City. An 18 MW heat pump produces enough heat for 9,000

homes in Oslo. An even bigger heat pump in Sweden, at 160 MW, gets its heat from treated wastewater. Finland has a 90 MW heating plant which is run on wastewater. Extremely cool—er, I mean hot!

Sky’s the limit. Oh wait! The sky really is the limit—atmospherically speaking. I’ve heard it said, regarding climate change, that we’re running an uncontrolled experiment on the only planet we have. European Union leaders are committed to transforming Europe into a highly energy-efficient, low carbon economy. The Europeans are making a solid attempt at implementing technologies which can make a difference. Many of us in the U.S. see energy efficiency as a fiscal responsibility, and protecting the environment is at least one of the reasons we work in this industry.

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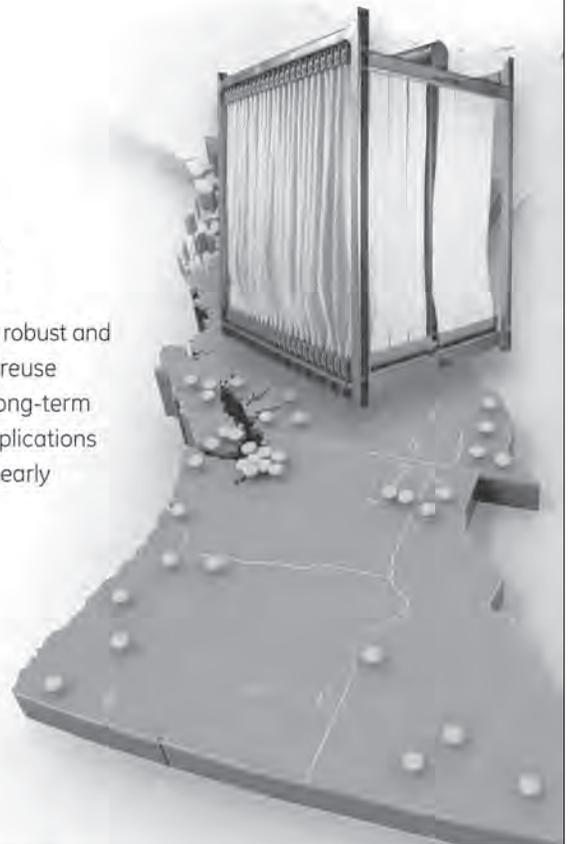
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To the Editor

I wanted to stop for a minute and share something with my fellow PNCWA members; you know it is nearly 2012! As a past president of the PNCWA/PNPCA it makes my heart glad to see how this volunteer organization has continued to grow and develop. Many of us are now in the position of being the "old guard." How did that happen?

What happened is that life has marched on and times have changed. One change I wanted to acknowledge is the change in the newsletter. Many of us know the term "MA" (Member Association) compares us against other Water Environment Federation affiliates. For many MAs their newsletter is filled with information and ideas. Reading the material in the fall 2011 newsletter, I can honestly say that the PNCWA's newsletter has arrived. The transition has come over the past couple years through a lot of hard work.

Many say that what makes a top organization is their ability to communicate information and ideas to others. The PNCWA has always done that at the annual conference and at section short schools. Now it looks to be happening in the newsletter. I see the newsletter shifting from news to a technical journal that can help all of us perform our jobs.

For that to continue to happen we all need to volunteer a little time and share what is going on in our neck of the woods. Realizing that what we have done to be successful may very well be someone else's current challenge.

This is a day when Google'ing can put just about any information at our fingertips. It is refreshing for me to open up a local magazine and know that if I have any questions or want to follow up all I need to do is pick up the phone and call a fellow PNCWA member.

Thanks to all of you that strive day in and day out to make our profession one that stays out of the news—and when it is in the news it is for achievements. Please keep (or start) sharing your experiences with the newsletter. Many members never get to the annual conference and depend on the PNCWA magazine to help our organizations be a little better.

My "hats off" to the Editor for building a very useful tool.

Best Regards,

Mark Walter, Past President 2000

Editor's response: Thanks so much for the nice sendup, Mark. The new and improved PNCWA newsletter was a huge team effort led by PNCWA staff Nan and Michael with guidance from Heather Stephens and the rotating Editorial Advisory Group which frequently includes Adam Zabinski, David Keil and Chris McCalib. It's my pleasure to work with all the contributors who generously share their time and expertise.

—Sheri Wantland

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New PNCWA Board Members

As of the annual conference in September 2011, we have four new PNCWA Board members. These volunteers will help guide our association forward in the years ahead.

MIKE OLLIVANT

Mike is our new vice president. Mike's industry experience comes from participation in a variety of projects and roles at Parametrix over the last 32 years including, sanitary sewer collection design, wastewater treatment rehabilitation, water transmission systems and water source design. Mike's roles at Parametrix have included Project Manager, Division Manager, Water Solutions Program Manager, Practice Area Lead, and Principal in Charge. His experience ranges from utility planning, preparation of contract plans, developing contract specifications, construction supervision, developing fiscal strategies, negotiation of inter-local agreements, and development of municipal standards and public works approaches for a variety of communities in the Northwest. Mike served as Conference Chair for the 75th PNCWA Annual Conference in 2008 in Kennewick.

RICK SHANLEY

Rick recently finished a 4-year tenure going through the chairs on the PNCWA Board and has returned to the board as one of two WEF directors. WEF directors sit on both the PNCWA Board and the WEF House of Delegates and serve as the communications bridge between the two. Rick's previous work on the PNCWA Board makes him ideal in this position since he is



(left to right) Mike Ollivant, Rick Shanley, Tom Hastings, Gil Bridges

well versed in the common hot topic issues as well as the mechanics of getting things achieved within a volunteer association.

Rick joined Carollo Engineers in 1995. He is a Vice President with Carollo and currently manages the firm's Portland office. His responsibilities in the environmental field have included research and development of emerging technologies, process analysis and modeling, and planning, design, and construction management on a variety of municipal wastewater treatment projects.

TOM HASTINGS

Tom is the new Eastern Washington regional director. His goal is to support the sections and the members within. Many of the towns in E WA are small and it is not unusual that one person is certified in both water and wastewater. Tom would like to increase the networking between all water professionals so that we may help one another be more successful. For example, he says you can follow him on Twitter @hastingstom or find him at [fonwon@groups.facebook](https://www.facebook.com/fonwon@groups) where he's a member. This is a closed group page where wastewater operators can come together to share ideas and stories.

Tom's career in water began in 1997 and he holds certifications as a level 3 WWTPO, Wastewater Collection Specialist 1, Basic Water Treatment Plant Operator, and Water Distribution Manager 1 in the state of WA. Tom is currently an Operations and Maintenance Manager for Veolia Water NA at the Upper Kittitas County Regional Wastewater Treatment Plant in Cle Elum WA.

The treatment process is a 3.6MGD SBR that was built and placed on line in 2005 and discharges into the Yakima River.

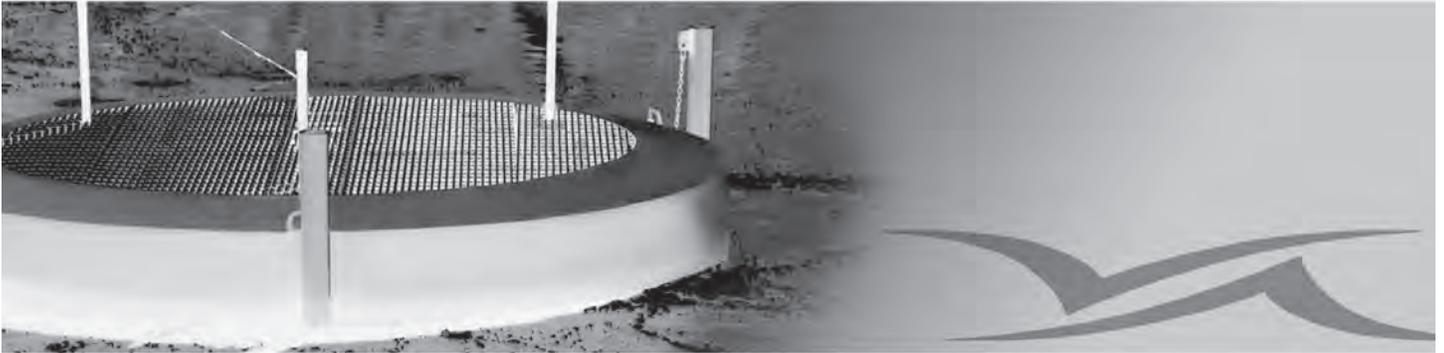
GIL BRIDGES

Gil comes to the PNCWA Board as the new Western Washington regional director. He has been involved and on the board of the Northwest Biosolids Management Association for many years. Within PNCWA, Gil has been involved with the NW Short Schools, helped restart the NW Section and has been its chairman for the past 2 years, and is looking forward to being more active within PNCWA while having a seat at the board as regional director.

Gil is the Wastewater Treatment Facility Manager for the Big Gulch WWTF and has worked for the Mukilteo Water & Wastewater District for 23 years. He started out as a temp worker just out of the Green River Community College water and wastewater program in 1988. Gil says this is the best industry (career) that he could have ever found himself working in.

The PNCWA Board is made up of twelve members who meet monthly—4 times a year in-person and by conference calls in other months. See the Key Volunteers—Contacts page in each newsletter issue for contact information for board members (as well as committee and section leaders). The photo on page 3 of this issue shows many of our board members—some that just ended their service to the board. Many thanks to all who have served on the board for your commitment to PNCWA, its mission and its members.

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How CMOM is helping Portland with intellectual transfer

Mark A. Braun, City of Portland

Anyone who has been with an agency for over 10 years knows how things get done...right? Well, we know who gets the call, what we need to do and that the report gets sent to DEQ but what happens between the call and the report? Or who takes the odor complaint and what happens with that call? Where is the data kept and who has charge of that data? Much if not all of that information is in the heads of staff who have been around for a number of years and were taught by those before them with adjustments made along the way to "improve" the system or just "get things done."

With the advent of CMOM, the City of Portland Bureau of Environmental Services (BES) has taken a long hard look at some of the processes required not only to get things done but to document the actions taken and get the appropriate reports out to regulators or the management team for annual reports. This is not an easy process since BES does not have its own field crews and has refined its organizational structure. BES has an Inter-Agency (I/A) with the Portland Bureau of Transportation Maintenance Operations Group Environmental Systems Division (ESD) to do sewer repair, cleaning and investigation, sewer locates, stormwater maintenance and 24-hour dispatch for emergency response to sewer related problems. Through separate meetings with staff from the two bureaus and with the management team from the two bureaus the various processes were discussed and documented so they could be mapped out.

Mapping the processes has documented the knowledge trapped in the minds of the "gray-hairs" and clarified some of the decision points and appropriate follow-on actions. This has also identified some of the changes that have taken place over the course of time, such as email replacing phones and faxes. Changes in the organization have also had an impact on the processes. What used to be a section is now a division in a group and there is a new section with different responsibilities but the communication path still must include personnel at the division level or in other new sections that have evolved over the years.

When the process mapping is finalized for these processes, BES will have documentation for new employees that will assist them in the performance of their duties and identify their role in the process. Also, regulators will be able to look at the documentation to follow the path of communication, identify the parts of the organization involved and their individual responsibilities and know where the data resides. This is a necessary part of CMOM.

Another benefit to the process mapping is the meetings that bring different sections together, helping them understand what

the other does in this process. This helps eliminate duplication of effort and builds confidence in who needs to be contacted for each step in the process. Some of the processes are daily activities that become second nature to veterans, but are not passed on to new staff in the detail needed to perform the duties of the position.

When all of the processes have been documented, the process maps will be handed out to staff and also put into a training manual for new staff. The maps will be reviewed on a recurring basis to coincide with updates of the CMOM Program Report and edited to reflect process changes.

You may contact Mark at mark.braun@portlandoregon.gov. He is a wastewater collection system maintenance engineering supervisor with the City of Portland's Bureau of Environmental Services.



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CALL FOR ABSTRACTS for the PNCWA 2012 Annual Conference is now open.

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Abstract submission closes March 16, 2012

**NO DEADLINE
EXTENSIONS
THIS YEAR**

The PNCWA2012 conference in Boise, ID is scheduled for October 21-24 at the Boise Centre. Abstract submittals are requested from all professionals, including facility and collection systems operations and maintenance staff, engineers, consultants, regulatory personnel, facility managers, and university researchers.

The emphases of PNCWA2012 will include strategies for meeting more stringent nutrient MDLs, opportunities to provide certification training for wastewater treatment plant operators, and the shift towards energy and resource recovery throughout the wastewater treatment process. Additionally, *sustainability*—water reclamation/reuse, sustainable development, natural treatment systems, onsite and decentralized treatment, sustainable water resources, and integrated water resources management—remains a priority.

Program topics include:

- Plant Operations: safety, laboratory, training, on-line analyzers, process control, information technology, automation
- Energy Efficiency and Recovery: applied and emerging technologies, operations, funding opportunities
- Advanced Wastewater Treatment: membrane bioreactors, phosphorus & nitrogen removal, limits of technology for biological nutrient removal, filtration, disinfection, sidestream treatment
- Conveyance: collection systems, pump stations, pipeline design, tunneling, CSOs, SSOs, I/I studies, outfalls, hydraulic modeling, operations & maintenance, condition assessment, FOG management
- Wet Weather Issues: CSOs, regulatory issues, long term control planning, storage facility design, permit compliance strategies
- Residuals/Biosolids: managing chemical sludge, class A processes, class B processes, sludge drying, thickening, dewatering, solids reduction, digestion, bioenergy, reuse, regulatory issues, alternative processes
- Odor Control: treatment plant, collection systems, air flow/dispersion modeling, industrial applications, new technologies
- Innovative Approaches: planning, design, construction, operation, maintenance, process optimization
- Public Involvement: perception, communications, education, outreach
- Stormwater: runoff control, collection, treatment, permitting, green stormwater infrastructure, low impact development
- Water Quality: regulatory issues, TMDLs, watershed permitting, receiving water quality, nutrient modeling, nutrient credit trading
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- Utility Management: emergency preparedness, asset management, financing, risk management, security
- Emerging Contaminants: microconstituents, analytical/limits of detection, laboratory requirements, fate and transport modeling
- Research: research that enhances the scientific and technical body of knowledge on relevant wastewater issues. This includes applied research to achieve practical solutions and measurable water quality improvement including "leading edge" university research, WERF research, or project-related pilot studies or research.

Abstracts must be submitted online by March 16, 2012 at www.pncwa.org/abstracts

Please limit abstracts to approximately 300 words and include a brief résumé. You need only to submit your abstract and your résumé at this time. Electronic copies of accepted presentations will be collected at the conference. Presenters are expected to register for the conference and pay all applicable registration and preparation fees. We are going to have a great technical program in Boise and hope that you can be a part of it. We look forward to seeing you at the conference in October.

Jeff Bandy, Ph.D.
Carollo Engineers
PNCWA2012 Technical Program Chair

For assistance contact JBandy@carollo.com or mikerainey@pncwa.org.

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Economics and asset management

By Marc W. Yarlott, Veolia Water NA, PNCWA Asset Management Committee Chair

The theme of the last PNCWA newsletter was Asset Management with several great articles from different perspectives. Each presented some significant steps toward developing a fully functional Asset Management program, yet each was the result of several years of work. With the current economic situation, many of us don't have the opportunity to pursue a comprehensive Asset Management program and we need to find some "low hanging fruit."

In my day job with Veolia Water North America, we are focusing this next year on not only our Asset Management program, but on practical ways to make low cost improvements across our smaller projects. One way to achieve this is to focus on training that covers common tasks that would be encountered during the year and then some innovative ways of "making things better."

One example of this kind of thinking which you might consider is training on how to prepare and glue PVC pipe for chemical systems. Most of us have successfully glued PVC pipe for our home and work water projects for years, but I discovered leaks develop quickly with chemical handling piping if PVC is improperly prepared. There is definitely a right way to prepare and glue for

improved life expectancy. At WEFTEC2011, I toured the vendors and found that a couple of PVC pipe and glue manufacturers provide training on materials and preparation methods for a quality glued joint connection. This seems like a simple opportunity that will yield a safer work environment, longer asset life, and ultimately savings of both chemicals and maintenance dollars.

Several other areas in routine maintenance could have similar leverage on costs simply by doing the task better, such as preparation and products for painting, proper handling of lubrication products, and using new epoxy-based materials to rebuild surfaces like old pump impellers. These are just a few easy ways to extend the life of an asset or even improve its efficiency.

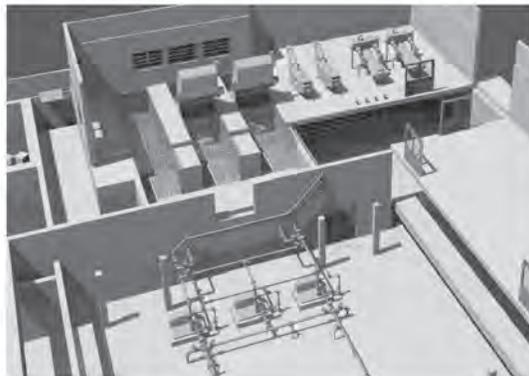
If you know of any tip or trick that can extend the life of an asset, please share them with others in your circle or with the broader PNCWA membership. Given the depth of the current economic downturn and its effects on public works funding, we all need to do more with less in the coming years. Please contact me if you have tips to share, questions or comments.

You may contact Mark at marc@wllcamg.com.

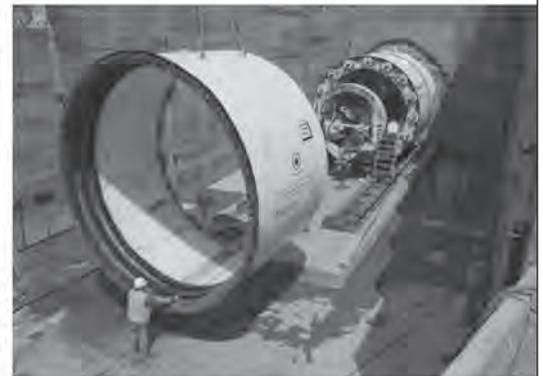
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George W. Burke, Jr. Award:
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City of Walla Walla (CH2M HILL)

Life Members: Henry
Burwell, Jeffrey Howard,
Ric Tower, Steven Simonson

Outgoing WEF Delegate:
Doug Allie, Goble Sampson
Associates

Outgoing President:
Andy O'Neill

Outgoing PNCWA Board
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Veolia Water NA; Doug Allie,
Goble Sampson; Kay Hust,
Clark County - Salmon Creek;
Thomas (Bud) Ruther, City of
Walla Walla (CH2M HILL)

President's Award: Karen
DeBaker, Clean Water Services

PNCWA Water Reuse Award:
Carnation Treatment Facility,
operated by King County
Wastewater Treatment Division

PNCWA Water Reuse Award:
City of Walla Walla (CH2M HILL)

PNCWA Water Reuse Award:
LOTT Clean Water Alliance

PNCWA Water Reuse Facility
of the Year Award: LOTT Clean
Water Alliance

Excellence in Biosolids
Management Award: City of
Tacoma's TAGRO Program

Crystal Crucible: Lorisa
Watkins, West Sound Utility
District

OPERATORS OF THE YEAR

Idaho OYA: Fred Rowe, City
of Idaho Falls

Idaho Collections System
OYA: Larry Parsons, City of
Coeur d'Alene

Oregon OYA: David Gehring,
City of McMinnville

Washington OYA: Richard
Smith, City of Kalama

Washington Collections
System OYA: Ed Fauxbel, Pierce
County (not pictured)



TOP ROW (PICTURED LEFT TO RIGHT)

Lorisa Watkins, Crystal Crucible recipient
Idaho OYA Fred Rowe, City of Idaho Falls (left)

2ND ROW FROM TOP (LEFT TO RIGHT)

Nela Rice, Laboratory Analyst Excellence Award
Idaho Collections System OYA Larry Parsons,
City of Coeur d'Alene

3RD ROW FROM TOP (LEFT TO RIGHT)

WEF Life Member, Steve Simonson

Oregon OYA David Gehring,
City of McMinnville

WEF Treasurer Chris Browning (left) presented
the Bedell award to Michael Myers

BOTTOM ROW (LEFT TO RIGHT)

Ben McConkey (left) and Shawn Redmond
received the Water Reuse Award for
LOTT Clean Water Alliance

Washington OYA Richard Smith, City of Kalama



PNCWA2011 Conference Operations Challenge

River Ranger Bob Fitzgerald makes a rescue (far left)

W4 Wonder Women of Wastewater team Dawn Hanthorn, Pamela Randolph, Catherine Dummer and Shannon Ostendorff (top, middle)

King County Poofighters (top right)

New Ops Challenge competitors (bottom right)

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Quilt Raffle Benefits Water for People

By Irene Wall, Tetra Tech, PNCWA Water for People Committee Chair



Brad Einfeld bought the winning ticket for the quilt



Kay Hust and Irene Wall (seated) sold many of the raffle tickets

PNCWA members, vendors and friends responded with enthusiasm for a chance to win a beautiful watery-themed quilt made by the Clark County Star Quilters with materials donated by Kay Hust. The quilt hung in the lobby of the Vancouver Hilton hotel during the fall PNCWA conference and Water For People Committee members were busy selling raffle tickets throughout the conference.

The lucky winner was Brad Einfeld (pictured with the quilt). Brad has been a PNCWA member since 1988 and purchased his ticket in advance even though he could not attend this year's conference. Brad has firsthand knowledge of the less than perfect sanitary conditions in other countries, having been a volunteer on development projects in Africa and El Salvador. Brad was

thrilled with the quilt, which arrived in time for his wife's birthday. He said, "Not that I don't plan ahead for these events, but the quilt was a welcome addition." How warm and fuzzy!

Proceeds from quilt raffle ticket sales totaled \$3,075 including a nice sum collected by the Select Society of Sanitary Sludge Shovelers who donated half their proceeds from the annual inoculation ceremony to the WFP fund. Nan rushed a check to Water for People in time to be counted toward their \$2 Million Challenge. A big thanks to everyone who participated in the raffle and special thanks to Kay Hust and the Star Quilters for their generous donations of materials and time to make the quilt.

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Thank you for all 2011 In-Kind Contributions to PNCWA

In addition to financial sponsorships in support of PNCWA each year, many activities of PNCWA are supported by organizations in such forms as volunteer time, covering travel expenses incurred by volunteers, and donating services. Thanks to the following organizations for these kinds of support in 2011. And although not listed here, all committee members and workshop/webinar presenters provide value in fulfilling the mission of PNCWA—thanks to all of you and to your organizations as well.

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Max Hildebrand, PNCWA Board of Directors
Mark Smith, Odor and Air Quality Committee Chair

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Highlights

- 25,000 GPD / \$1.66M
- DOE Permit
- UV Disinfection
- Contract Operations: 1 day/week
- Public Design-Bid-Construct
- Greenfield Construction: 8 Months, No Change Orders

PARAMETER	INFLUENT AVERAGE	EFFLUENT AVERAGE
BOD	356 mg/l	< 3 mg/l
TSS	217 mg/l	< 2 mg/l
TKN/TN	75 mg/l	< 5 mg/l



Constructed Cost Breakout

MBR Equipment Cost	\$ 490K
MBR Facility Construction	\$ 1.17M
Total Constructed Cost	\$ 1.66M

- Operations Building
- Concrete Basins
- Installation of MBR Equipment
- Influent Pump Station
- Odor Control
- Autosamplers and Flow Metering Manhole
- Power Generator/Transformer
- All Site Work (water, sewer, grading, paving, fencing, etc)
- Temporary Erosion Control

CONTRACTOR ITEM	BID
Trench Safety Excavation Provisions	\$ 1,000
Mobilization and Demolition (NTE 7.5%)	\$ 165,149
Traffic Control	\$ 1,000
RV Dump Facility	\$ 33,627
MBR Facility	\$1,171,993
Campground Sewer Facilities	\$ 380,385
Campground Water Facilities	\$ 148,253
Campground Electrical Facilities	\$ 465,366
Asphalt Surface Restoration	\$ 45,320
Tree Removal	\$ 3,000
Total	\$2,415,093



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Energy Efficiency Introduction

By Jennifer Belknap Williamson, P.E., LEED AP, City of Gresham and PNCWA Sustainability Committee Chair

This issue of the PNCWA newsletter is focused on energy—a critical commodity in the water and wastewater sectors. The U.S. Department of Energy predicts that worldwide energy consumption will grow by a whopping 44 percent in the next 20 years, driven in large part by economic growth in the developing world.

This continued increase in demand for energy is driving up the costs of oil, coal, natural gas and other resources used to make energy. Even those of us in the Northwest who have access to relatively inexpensive hydropower are still subject to the impacts of high energy costs, such as when our utilities must purchase peak demand power on the open market and when we purchase fuel for fleet vehicles.

Fortunately, the wastewater and water sectors have become increasingly savvy about energy efficiency and renewable energy generation as energy costs continue to rise, and we have wonderful opportunities at our facilities to continually improve our energy performance. Whether your facility has a long history of energy efficiency or you are just embarking on efforts to reduce your energy use, there's always more to learn and new problems to solve.

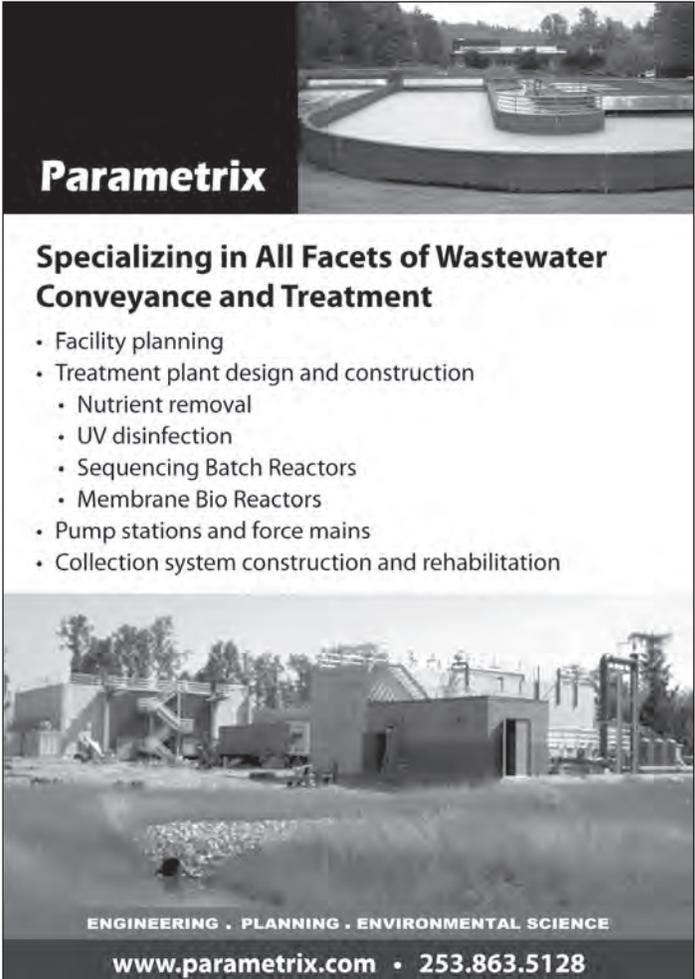
Read on to learn about success stories and innovative ideas for conserving and generating energy at WWTPs and other municipal facilities. Highlights include:

- The City of Vancouver, WA describes their successes as a part of BPA's Energy Smart Industrial Program, which has resulted in saving approximately 1 million kWhrs and tens of thousands of dollars per year.
- The Oregon Department of Energy provides an overview of a new feasibility study investigating the opportunities to use wastewater biogas as a transportation fuel at four Oregon WWTPs.
- The City of West Lafayette, Indiana's exploration of unconventional feedstocks to generate more biogas through a pilot project illustrates opportunities in the Northwest as well.
- The Washington Department of Ecology and Public Works Board describe the new state requirements for energy efficiency audits as a condition of funding from state agencies.
- Opportunities for using heat pumps to extract heat from plant effluent are expanding with improving technology and a range of applications.
- An extensive O&M Energy Efficiency Checklist for WWTPs identifies the collective ideas of many wastewater

professionals to reduce energy use through no cost or low cost operational improvements.

We hope this issue spurs your continued efforts to reduce energy use and expand renewable energy generation. We are all part of developing new solutions to our energy challenges. The PNCWA Sustainability Committee is currently developing plans for a webinar series on renewable energy lessons learned at municipal water and wastewater facilities. Look for the first webinar in February 2012! Please let us know if there are any topics you would like to learn more about.

You may contact Jennifer at j.belknap.williamson@greshamoregon.gov.



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Efficiency audit saves money and energy for your community

By David Dunn, WA State Dept. of Ecology and Stephen Dunk, WA State Dept. of Commerce

Performing an audit of your utility's power usage is an excellent idea for both the operations and business management arms of your utility. In fact, starting this year, the Washington State Legislature is requiring Investment Grade Efficiency Audits as a condition of funding from the Department of Health, Department of Ecology, or the State's Public Works Trust Fund.

An investment grade efficiency audit is a detailed technical study of a facility's systems and processes. An experienced energy engineer will identify opportunities such as control system improvements, pumping or fan system modifications, methane capture and use strategies, lighting system upgrades or other measures that reduce energy use. The study includes an evaluation of the economic performance and investment value of potential upgrades. Armed with this information, a utility can make decisions about if, when, and how to implement some or all of the energy efficiency measures.

There are many reasons for a wastewater utility to invest in energy efficiency:

1. **Energy is money.** Wastewater treatment is a very energy intensive process. Savings in energy costs could mean extra funding for training, maintenance, capital improvements, or preventing rate increases.
2. **Energy is Carbon.** Utilities are focusing on greenhouse gas emissions and the carbon footprint of facilities. Reducing the energy used at

wastewater facilities often reduces the carbon emissions associated with electricity production.

3. **Incentives are available.** Most electricity providers offer grants and incentives for energy efficiency upgrades.
4. **Financing is available.** Ecology and the Public Works Trust Fund offer low interest loans and financing for capital improvements, including energy efficiency upgrades. The State Treasurer's Office may also provide low interest financing for energy efficiency to qualified borrowers.
5. **Expertise is available.** The State of Washington's Department of Enterprise Services, Energy Program provides expert assistance through the Energy Savings Performance Contracting program (more on that in a moment). In addition, most power providers offer no-cost or low-cost audit services that are meant to help you identify conservation opportunities within your facility.

Scoping audits are often available at low or no cost from the power providers. In Washington, power is delivered either through investor-owned utilities, (e.g., Puget Sound Energy, Avista, & Pacific Power) or through publicly-owned utilities, (municipal and county PUDs such as Tacoma Power, Clallam County PUD, Inland Power, etc.) Wastewater utilities should contact their local power provider and ask if assistance is available. Scoping audits provide a list of potential energy conservation opportunities, and generally identify

current energy consumption as well as an estimate of energy savings available through modifications.

Washington's Department of Enterprise Services (DES) Energy Program offers wastewater utilities an option for obtaining an Investment Grade Efficiency Audit through their Energy Savings Performance Contracting (ESPC) program. The ESPC program allows wastewater utilities to contract with Energy Services Companies (ESCOs) through an inter-agency agreement with DES. The ESCO will initially prepare a scoping audit, and if that preliminary audit indicates that substantial energy savings are possible at the facility, will prepare an investment grade audit. Using ESPC performance based contracting, the ESCO will guarantee project costs, energy savings, and equipment performance for the energy efficiency measures identified in the investment grade efficiency audit. More information on the State's ESPC program is available on the web at: <http://www.ga.wa.gov/EAS/epc/epc.htm>.

Washington State has seen an excellent record of success in employing energy efficiency audits. Since 1986 the State has completed over 500 projects valued at over \$300 million in construction costs. Those projects have resulted in documented energy savings valued at over \$100 million to public sector customers. Those projects also received over \$30 million in electric and natural gas company incentives.

Washington State has seen an excellent record of success in employing energy efficiency audits. Since 1986 the State has completed over 500 projects valued at over \$300 million in construction costs. Those projects have resulted in documented energy savings valued at over \$100 million to public sector customers. Those projects also received over \$30 million in electric and natural gas company incentives.

In part, it is that success that motivated the Legislature to require investment grade efficiency audits in utility projects receiving state grant and loan funds. In fact, we have found that many public sector entities have already performed audits of their facilities. In some cases the project receiving state funding was the direct result of a previous audit. In that case the legislative requirement is fulfilled. In other cases the utility may have completed an audit on another portion of the same facility receiving state funding. Utilities that have been performing energy audits at their facilities prior to the legislative requirement are already doing exactly what the Legislature is trying to encourage.

Start the process with a preliminary or scoping audit. The scoping audit can help determine if an investment grade efficiency audit is required by the State funding agency for your project. Many stormwater or collection projects use no energy at all, simple technologies like facultative lagoons or recirculating filters require so little energy an audit itself may not be cost effective, and new facilities may already employ highly efficient systems and

practices. Working with your State funding agency, you may find out that the efficiency audit requirement is fulfilled by the scoping audit. A scoping audit can be obtained at no cost or low cost through State ESFC program or through your local power provider.

An investment grade efficiency audit may not make sense for all projects receiving state funding. Projects that are have begun design or those already under construction can meet the legislative requirement through design review of the proposed improvements. Design review may be performed by an energy specialist subcontracted to the design team, as separate peer review process focused on energy efficiency, as a service offered by the electric company (if available), or as part of a broader value engineering effort. However it is performed, the design review should investigate energy saving design elements for incorporation into the project including operational impacts, capital costs and payback period for the efficiency improvements.

For those projects where neither design review nor a formal audit is appropriate, waivers may be granted.

Utilities should contact the funding agency for advice and assistance in developing a waiver request. Utilities receiving state funding for projects with a waiver are encouraged to use energy efficiency measures that make sense and to consider performing energy audits on other public facilities in their community. One community contacted regarding this requirement had already scheduled energy audits for their water and sewer utilities, city hall, their fire station, and their public library.

We understand that investment grade efficiency audits are a relatively new requirement for many in the wastewater community. The Department of Ecology and the Public Works Board are happy to talk through specific questions anyone might have about their individual projects. We would also like to stress that performing an audit (if you are seeking state funding or not) is an opportunity for your utility to operate more efficiently, and save both money and energy for your community.

You may contact David Dunn at David.Dunn@ecy.wa.gov and Stephen Dunk at Stephen.Dunk@commerce.wa.gov



Before and after lighting at West Valley School District, Yakima

Heat Extraction from Plant Effluent: Pumped Up Heat Pumps

By Eron Jacobson, Bo Vestergaard-Hansen and Rick Kelly of Brown and Caldwell

While wastewater effluent has been used as a heat source for heat pumps for well over 30 years, the availability of digester gas to produce heat for process and space heating loads coupled with the small range of heat pump sizes, temperatures and technologies that would work with wastewater effluent kept the use of effluent heat pumps low. Digester gas produced at facilities with anaerobic digestion has traditionally provided process and space heating demands through boilers or cogeneration. Some facilities are finding it more profitable to use digester gas methane in alternative applications, such as a fuel source for municipal fleet vehicles, as a biomethane source for natural gas utilities, or for biosolids drying. Heat pump technologies have advanced in recent years to provide high temperature hot water (up to 180°F), and in instances where there is insufficient or alternative uses for digester gas or at facilities that don't have anaerobic digesters, effluent-source heat pumps can provide an economical alternative heat source.

Treated effluent from a wastewater treatment plant (WWTP) offers a convenient and reliable source of heat at a relatively high temperature (compared to surface or ground waters). Effluent temperatures are above 50°F throughout the year for most plants. The relatively stable and high temperature of wastewater effluent can make effluent heat recovery beneficial under conditions where there is a demand for the heat external to the plant, such as nearby district heating opportunities or industrial users, and relatively low electricity cost. Heat pumps can also provide cooling in the summer for utilities located in warmer areas.

Most heat pumps run on a closed-loop mechanical vapor compression refrigeration cycle. In this cycle, a liquid coolant

at a temperature below that of the effluent is vaporized by extracting heat from the wastewater effluent in an evaporating heat exchanger. The vaporized coolant is then compressed by one or more compressors, resulting in a high-pressure hot vapor. The hot vaporized coolant is then run through the condensing heat exchanger, where heat is transferred to the hot water loop and the coolant is partially condensed. After the coolant leaves the condenser, it drops in pressure and temperature across an expansion valve and again enters the evaporating heat exchanger at a temperature colder than that of the effluent. Heat pumps consist of four pieces of equipment: the compressor, condenser, evaporator, and expansion valve. Figure 1 shows a schematic of a water-to-water heat pump for effluent applications.

A heat pump's efficiency is measured by its coefficient of performance (COP). The COP is a comparison of the valuable heat out of the heat pump compared to the power used to generate this heat. The high temperature wastewater effluent heat pumps available on the market today have COPs between 2.0 and 3.5 at temperatures between 160°F and 175°F. This means that for every 1 kilowatt (kW) of electric power sent to an ideal heat pump, 2 to 3.5 kW of valuable heat is provided out of the unit. The COP is dependent on the effluent temperature, hot water temperatures to be generated, and efficiency of the cycle. Since hot water system temperatures at WWTPs often operate between 160°F and 200°F to provide adequate temperatures for process heating, the heat pumps that produce these temperatures are considered high-temperature heat pumps. When high temperature hot water is not a priority, heat pumps that provide lower temperature hot water (e.g., 130 to 150°F) can be used as these have much higher COPs.

The market for high-temperature heat pumps has been growing in the U.S. over recent years. At least four U.S. manufacturers now offer heat pumps that can produce hot water at 160°F and higher with typical effluent source temperatures. Heat pumps are able to achieve higher hot water temperatures by virtue of greater compression ratios, typically through the use of multistage compression. The U.S. manufacturers of high-temperature heat pumps include McQuay, Trane, York, and Multistack, while there are also a number of European and Japanese manufacturers of these units.

The McQuay heat pumps are relatively new to the high-temperature market (only since 2009) and have relatively small capacities, but can work in parallel to provide larger net capacities. The capacities for the high-temperature units range

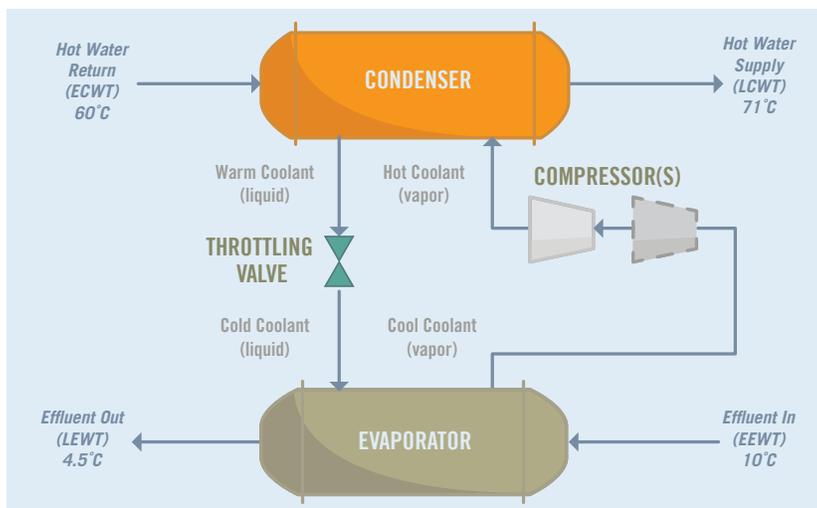


Figure 1. Heat pump schematic

from 0.6 to 3.1 million Btu per hour (MM Btu/hr). The high-temperature heat pumps that Trane has manufactured have historically been custom-designed, and therefore have non-standard capacities. The existing installations of these units and other studies include capacities between 8.5 and 12 MM Btu/hr. York produces two standard models of high-temperature heat pumps. The York models are relatively large, ranging from about 25 MM Btu/hr up to 75 MM Btu/hr. Multistack produces heat pumps with much smaller capacities than those made by the other manufacturers, but still achieves high temperatures. The capacities range from 100,000 to 600,000 Btu/hr and these units are ready-made to be run in parallel. An example of a high temperature heat pump is shown in Figure 2.



Figure 2. McQuay Templifier™ (photo copyright McQuay International, used with permission)

A considerable number of heat pumps around the world operate on treated wastewater plant effluent. While the largest applications of this kind are outside of the U.S., a growing number of heat pumps have been installed in the U.S. since the 1980s. Some of these facilities and their heated water uses include:

- **Renton, Washington:** Heat pumps use effluent to provide up to 24 MM Btu/hr of heat for process and space heating needs at King County's South Treatment Plant.
- **Whistler, British Columbia:** Wastewater effluent provides up to 4.3 MM Btu/hr of space heating through a district heating system.
- **Avon, Colorado:** A heat pump of 3.4 MM Btu/hr is planned to be installed to utilize effluent from the Eagle River Water and Sanitation District for space heating, swimming pools, and snow melting.

- **Virginia Beach, Virginia:** Effluent from the Hampton Roads Sanitary District, Atlantic Treatment Plant provides up to 5.5 MM Btu/hr of heating with heat pumps and 53 MM Btu/hr of cooling as chillers.

Already, effluent-source heat pumps are growing in popularity in the U.S. and around the world. As alternate demands for biomethane production from anaerobic digesters grows, the use of effluent source heat pumps for capturing some of the residual heat we put into wastewater will become more common, especially as the technology can provide adequate temperatures for both space and process heating. So the next time you are looking for proven, sustainable technologies to incorporate into your plant that can save energy and money, effluent-source heat pumps are worth a look.

You may contact the authors at ejacobson@brwnncald.com, bvhansen@brwnncald.com and rkelly@brwnncald.com.

PGE's new Energy Partner incentives

By Jennifer Belknap Williamson, City of Gresham, PNCWA Sustainability Chair

Like many municipalities, the City of Gresham is looking for ways to reduce our energy consumption and track our progress toward meeting our sustainability goals while minimizing upfront costs and maximizing long term savings. We recently had a presentation to our City Energy Management Team by Portland General Electric (PGE) and their partner RTP Controls on a new Energy PartnerSM

program available to PGE business/ industrial customers that may help us with those goals.

The program offers to pay financial incentives and provide a no-cost energy audit and energy use tracking controls in exchange for participating in a program that automatically reduces the customer's energy consumption temporarily during periods of peak demand on the grid. It's a way

of using smart grid technology to meet peak energy demands, reducing PGE's need to buy energy on the volatile open market. We are currently considering the feasibility for implementing the program at some of our City buildings as well as at our wastewater treatment plant.

PGE is offering this program to provide incentives for customers to reduce energy use during peak times, usually

Continued on page 22

Continued from previous page

extremely hot summer or cold winter days, to help support PGE's power generation resources. Through the program, PGE can initiate energy reduction events through the GridLogic System™ with 10-minutes notice on non-holiday weekdays for up to 4 hours at a time. Events can be called once per day on up to two consecutive days, with a maximum of 15 total events or 40 total hours per season. During summer (July–Sept.), events can be called between 3PM and 7PM. During the winter (Dec.–Feb.), events can be called between 6AM and 10AM and between 5PM and 9PM.

Participation in energy reduction events is completely hands-off through RTP's intelligent automated

demand response system—the GridLogic System™. RTP will work with each participant to design acceptable strategies for energy reduction that respect operational needs and deliver the best results. PGE customers that participate in the Energy Partner SM program receive Participants availability payments for their participation in the program as well as performance payments for actual energy reductions during events. Participants are also provided with energy management tools at no cost such as access to real-time, high-resolution energy monitoring and automated response to events through RTP's automated demand response technology, the GridLogic System™.

PGE notes that participants can promote their participation in the Energy PartnerSM program as a municipal responsibility initiative that helps to ensure reliable and responsible electricity for the community and helps reduce their carbon footprint. RTP and PGE are looking to sign up municipalities across the PGE service area as soon as possible. Eligible participants will receive a free energy reduction audit with customized participation strategies. For more information, contact program manager Kate Reimer at 503-779-7442 or Kate.reimer@rtpcontrols.com.

You may contact Jennifer Belknap Williamson at j.belknap.williamson@greshamoregon.gov for more information on Gresham's Energy and Sustainability Initiatives or the PNCWA Sustainability Committee.

What else can you put in there? Unconventional feedstock helps make the most of anaerobic digesters

By Luke Werner and Dawn Lesley, Kennedy/Jenks Consultants

When process units have additional capacity, many plants merely consider it operating 'cushion,' keeping them comfortably distant from any violations and comfortably insulated from negative effects of any poor operational decisions. For Dave Henderson, the Utilities Director at the City of West Lafayette Indiana's Wastewater Treatment Plant, public infrastructure should serve the public to the greatest extent possible. Although it was far ahead of most of the industry, it wasn't enough for their plant to bring in 3,000 gallons per day of fats, oil and grease (FOG) and 2 tons per day of food waste. These programs took a tremendous load off the collection system and aided Purdue University in reducing their operating costs, as well as garnering the City of West Lafayette state and national recognition as an environmental steward.

Still, Dave was acutely aware of the existence of additional excess capacity and he was not content to let that sit idle until some future time when population growth might utilize it. No, West Lafayette's values dictated that infrastructure would be best put to work for the citizens and they pursued other sources of anaerobically digestible material. What they found blew the pressure relief valves!

West Lafayette, Indiana is a community of 36,000 people located 70 miles NW of Indianapolis. Purdue University contributes an additional 37,000 people when school is in session. The City of West Lafayette Wastewater Treatment Plant treats an average of 8 MGD. The plant implemented digester improvements and cogeneration in 2009. Meanwhile, planned population growth did not materialize. After successful implementation of FOG and food waste systems, additional capacity was still available.

After looking at a few options, the City decided to run a pilot test with thin stillage, a byproduct of ethanol production. This material has a chemical oxygen demand (COD) of 150,000 mg/L, pH of 5, a temperature of 140 degrees F and it is produced in abundance in Indiana. During the 2-month pilot testing, 5800-gallon loads were brought into the plant once or twice per week depending upon availability, and metered into the digester at 10 gallons per minute. The immediate effects on gas production were dramatic, as the cogeneration system realized maximum output, waste gas burner flame doubled in height, and PRVs on both digesters popped.

Already warm and lacking contaminants, the material was an excellent feedstock, producing 36 cubic feet of digester gas

per gallon of thin stillage. Not all the news has been good, though. Additional effects of the pilot were:

- Difficulty in balancing pH has affected the bacterial population in the digesters, favoring the acid-formers
- Alkalinity loss resulted in the need to suspend the pilot a few weeks before originally planned
- Struvite formation caused rapid deposits in the lagoon supernatant pump and piping

The plant is reviewing the pilot test data to decide whether the operational challenges block the implementation of a full-scale thin stillage receiving station. Also, there are gas usage issues to resolve—West Lafayette’s existing cogeneration equipment is maxed out. Viable options include the installation of additional microturbines, implementing a compressed natural gas (CNG) fueling station and/or the possibility of cleaning up the gas to pipeline quality to sell to the natural gas utility.

If the operational challenges of thin stillage are determined to be too great, the plant is also considering additions of:

- Commercial food waste from other sources besides Purdue
- Corn sugar washdown water
- Wheat starch
- Biodiesel manufacturing byproducts (primarily glycerin)

All of these have high biochemical methane potential (BMP), with the latter three materials containing COD concentrations ranging from 80,000 to 250,000 mg/L.

For plants considering supplementing their digester feed, the benefits can be many. In addition to enhanced digester gas production, plants have also found reduced biosolids production, believed to be attributable to an improvement in the carbon to nitrogen ratio. When seeking feed sources, look for materials that lack:

- Heavy metals
- High ammonia
- Extremely low pH

In the Pacific Northwest, good candidate feedstocks may also include brewery, dairy, and can crushing wastes. Taking the initiative to maximize your plant infrastructure’s beneficial use can be a cost-effective and satisfying way to improve your bottom line and enhance the sustainability of your community.

You may contact the authors at lukewerner@kennedyjenks.com and/or dawnlesley@kennedyjenks.com.

Energy efficiency improves treatment plant operations and saves tens of thousands of dollars per year

By Layne McWilliams, Bonneville Power Administration’s Energy Smart Industrial Program

“In the past, we didn’t systematically think about energy efficiency,” said Frank Dick, Industrial Pretreatment Coordinator for the City of Vancouver. “Today, it’s an integral part of our operations.” The City of Vancouver, WA typically treats more than 20 million gallons of wastewater each day. This requires substantial aeration systems and ultraviolet (UV) light arrays at the city’s two wastewater treatment plants (WWTPs). While these systems are critical for supporting the biological treatment process and destroying harmful bacteria and pathogens, they consume large quantities of power.

“Through a series of workshops and a subsequent energy audit, we found that we could improve our energy efficiency

without impacting water quality,” says Dick. “We also learned that we could receive rebates for energy efficient equipment and incentives for power reductions from Clark Public Utilities, so we jumped at the opportunity.”

These incentives and rebates are supported by the Bonneville Power Administration’s (BPA) Energy Smart Industrial (ESI) program, which works with local utilities and their industrial customers—offering project management, technical assistance and financial incentives—to advance energy efficiency throughout the northwest. With the help of BPA’s ESI program and Clark Public Utilities, the City of Vancouver has made a series of energy improvements



at its Westside and Marine Park WWTPs. Replacing one blower at each plant with a high-efficiency airfoil turbo blower has resulted in a 35 percent power decrease in blower operations at the city’s Westside facility, and up to a 50 percent decrease at the Marine Park facility.

“We used to have two blowers constantly running at each facility,” explains Aaron Kraft, Project Manager for Veolia Water North America, which operates

Continued on page 24

Continued from previous page

the WWTPs for the City of Vancouver. “Now we can get by with a single turbo blower at each treatment plant most of the time.” The city also installed a variable frequency drive (VFD) on the water recycling system at its Marine Park facility. Instead of running continuously, the VFD automates pump operation based on demand, saving an estimated 220,000 kilowatt-hours per year (kWh/y).

In addition to capital improvements, the city and Veolia learned how to optimize energy usage for various system conditions. By fine-tuning the set points of its UV arrays based on flow and daily

water tests, the team reduced its UV energy consumption by 27 percent, representing nearly 15 percent of the entire load at the WWTPs. “No pun intended, but our UV usage was a matter of overkill,” says Kraft. “We partnered with the ESI team, who helped us measure contact time in relation to flow. We found that we can use less UV during low flow periods and still meet our permit requirements.”

These changes are saving the facilities roughly one million kilowatt hours and tens of thousands of dollars per year. Also, ESI support and utility incentives covered about 30 percent of the project’s capital costs.

“It’s been great working with Clark Public Utilities and BPA,” said Dick. “The ESI program is unbelievably well organized. They included and motivated our entire staff. They were actively engaged throughout the process, from baseline testing to ongoing monitoring. And they continually look for additional energy efficiency opportunities. We’ve been thrilled with the results.”

You may contact Layne McWilliams at layne.mcwilliams@energysmartindustrial.com.

WWTPs providing transportation fuel? Feasibility study underway in Oregon

By Matt Krumenauer, Oregon Department of Energy

This summer Janet Gillaspie from the Oregon Association of Clean Water Agencies (ACWA), Thad Roth from Energy Trust of Oregon and I were discussing energy conservation and renewable energy opportunities at wastewater treatment facilities. As broad as the opportunities are and the depth that Janet and Thad bring to the table, you can imagine the wide ranging discussion we had. One topic we discussed in depth was the number of treatment plants that have recently evaluated their Anaerobic Digestion systems or would be in the near future. The reasons for the evaluations varied but they all had a decision point in common. Oregon wastewater treatment plants use biogas for process heat and power, and some generate electricity using biogas turbines. But what other opportunities for biogas use existed?

One area that has generated interest across the country is the use of biomethane as a transportation fuel. Janet suggested that a few of her members would be interested in speaking further about this opportunity; therefore we set up a brainstorming session to gauge interest. During the meeting, it became clear there is interest in evaluating biogas opportunities, and there are other facilities that would benefit.

Back at the Oregon Department of Energy, we determined that this was definitely an area of interest for the State and an area that we could assist by building a body of knowledge about the technology and its application and offer assistance to not only the clean water industry in the region, but more broadly to the growing Northwest biogas industry. We were able

to partner with ACWA and its members, Metro, NW Natural, Energy Trust of Oregon, Washington State University, and others to fund a detailed biogas technology evaluation and feasibility study.

The group selected TetraTech NUS, Inc. to complete the study and it is currently underway. The first step is to complete a technology assessment. This will involve a detailed evaluation of biogas purification and upgrading technologies, inventory handling and storage requirements, and evaluate available technologies for use of biogas in two ways: Injection of upgraded biogas into the existing natural gas grid, and refueling of natural gas-powered vehicles. The second step will be an economic evaluation of the available markets, life-cycle analysis and risk assessment, and an analysis of the environmental attributes including all regulatory requirements.

With this information, a more detailed feasibility analysis will be completed at four Oregon wastewater treatment plants in Portland, Gresham, Salem, and Klamath Falls. The feasibility analysis will also include an assessment of the current and potential fleet use and necessary fueling infrastructure. This approach will provide a base of knowledge and a methodology that can be utilized and replicated by other facilities, including wastewater treatment plants, in the region. We will complete the study by the end of February. The final report will be released shortly thereafter.

You may contact Matt Krumenauer at 503-383-8694 or matt.krumenauer@state.or.us.

O&M Energy Efficiency Checklist for Wastewater Treatment Plants

The purpose of this list is to help identify no cost or low cost electricity savings through operation and maintenance practices at wastewater treatment plants. The list is organized by System (blower aeration, mechanical aeration, mixing, pumping, etc.) in approximate order from highest to lowest energy use. Therefore, start at the top of the list and work down. Because some measures are common to multiple systems,

they are repeated, so that each system has a complete list. Please review “Other Measures” on last page, which lists important ideas applicable to the entire plant.

Please distribute this open source document to anyone who might be interested, and please provide comments, suggestions, and new ideas to Walt Mintkeski, P.E., at mintkeski@juno.com, 503-771-0232, in Portland, Oregon.

BLOWER AERATION SYSTEM

- Fix air piping leaks. For exposed pipes, apply soapy water to create bubbles. For underground pipes, look for air bubbles surfacing through soil during or just after rain events.
- Reduce air demand—reduce or eliminate air flow to aerated channels and empty aeration basins; reduce air flow to aerated grit chamber; take excess aeration basins off line.
- Eliminate air flow restrictions clean intake air filters, fix sticking check valves, open or eliminate throttling valves, enlarge undersized valves or piping.
- Minimize inlet air temperature for centrifugal blowers, especially those which draw air from inside buildings (such as turbo blowers).
- Dissolved Oxygen (DO) Control Sensors—clean and check DO Probe calibration twice a month; airflow meters and pressure sensors annually.
- Check placement of DO probe in basin for representative DO reading.
- Lower DO set point to lowest possible setting which results in proper treatment. (That should be less than 2 PPM. However, if either ammonia or nitrogen removal is required, higher set point may be required, especially during cold weather).
- Lower blower output pressure by fully opening air valve to highest demand aeration zone, and then balancing other air valves to obtain uniform DO set point concentration across remainder of aeration basin; check and tune the settings annually. Use Most Open Valve control strategy for plants with centrifugal blowers and more than 3 aeration basins.
- Monitor Blower Performance—check air flow and pressure against blower curve to determine if units are operating at most efficient point.
- Identify most efficient blower (highest SCFM/kW) and program controls to run that unit as primary blower.
- If different capacity blowers are available, program blower operation to match diurnal air demand. If blowers are positive displacement units, adjust belts and sheaves to match output to diurnal air demand.
- Monitor SCADA System to identify if 2 or more blowers operate at reduced speed. Determine if one unit at higher speed will satisfy demand while drawing less kW. If so, take excess equipment off line.
- Diffuser air flow—check CFM/diffuser rate. If it exceeds manufacturer’s recommendation, add diffusers or reduce air flow per diffuser to restore oxygen transfer efficiency.
- Diffuser maintenance—every week, look for air “boils” which could indicate broken pipes or diffusers; measure air pressure of each drop leg at a set SCFM blower air flow rate, to detect distribution piping resistance and diffuser fouling. Remove blockages; flex diffuser membranes with air pulses or clean diffusers as needed to reduce pressure and increase oxygen transfer efficiency.
- If nitrification is not required, lower Mean Cell Residence Time to 4–5 days and turn off aeration system from 1 to 2 hours during the early morning low flow period in order to inhibit nitrifying bacteria.
- Convert first zone of aeration basin to anoxic selector. Anoxic zone helps remove surfactants, which increases oxygen transfer efficiency.

MECHANICAL AERATION SYSTEMS

- Check that the submerged depth of the mechanical aerator is set to produce the maximum mixing and aeration at a lowest amperage draw.
- Stage unit operation to match DO demand. If different capacity units are available, program operation to match diurnal air demand. Use timers to turn units ON/OFF or VFDs to change speed. Take excess units off line.
- Monitor SCADA System to identify if 2 or more aerators operate at reduced speed. Determine if one unit at higher speed will satisfy demand while drawing less kW. If so, take excess equipment off line.
- Dissolved Oxygen (DO) Controls—Lower DO set point to lowest possible setting which results in proper treatment (less than 2.0 PPM for aeration basins and as low as 0.2 PPM for aerobic digesters).
- DO probe—clean and check calibration twice per month, replace parts as needed.
- Identify most efficient unit (lbs of O2 transferred/kWh) and program controls to run that unit as primary unit.

- If nitrification is not required, lower Mean Cell Residence Time to 4–5 days and turn off aeration system from 1 to 2 hours during the early morning low flow period in order to inhibit nitrifying bacteria.
- Monitor units for excessive vibration and amp draw to detect fowling. Clean and recheck.

SECONDARY TREATMENT

MIXING SYSTEM (in anoxic or anaerobic cells of aeration system) AND ANAEROBIC DIGESTER MIXING SYSTEM

- Reduce number of aeration basin mixers and/or speed of units to point where solids settling is just beginning to be observed (visually on the surface or by tube sampler through tank depth). Take excess equipment off line.
- Reduce number of anaerobic digester mixers (or pumps) and/or speed of units to optimize methane production. Take excess units off line.
- Identify most efficient unit (GPM/kW) and program controls to run that unit as primary unit.
- Monitor units for excessive vibration and amp draw to detect fowling. Clean and recheck.

PUMPING SYSTEMS—LIFT STATIONS, RAS; WAS; TRICKLING FILTER AND AERATION BASIN RECIRCULATION

- Reduce RAS, WAS, and Primary Sludge flow rates to minimum needed. This increases solids concentrations and reduces pumping of excess water.
- Reduce Trickling Filter and Aeration Basin recirculation rates to minimum needed. This reduces pumping of excess water.
- Fix piping leaks and pump leaks (packing & seals).
- Eliminate piping restrictions, throttling valves, unnecessary valves, sticking check valves.

- Flush scum and sludge piping periodically to reduce headloss.
- Reduce pumping head—raise liquid level at pump inlet to maximize suction pressure.
- Monitor pump performance—check flow and total head (discharge pressure minus suction pressure) against pump curve to determine if units are operating on the curve and at most efficient point on the curve.
- Calculate wire to water (W2W) efficiency using flow, total head, and measured kW of pump & motor. Efficiencies should be at least 65% for raw sewage pumps, 70% for RAS & recycle pumps, and 75% for secondary effluent & reclaimed water pumps.
- If pump produces more flow than needed, consider trimming impeller instead of throttling.
- Where there are multiple pumps, identify most efficient pump (GPM/kW) and program controls to run that unit as primary pump. Take excess units off line.
- Monitor SCADA System to identify if 2 or more pumps operate at reduced speed. Determine if one unit at higher speed will satisfy demand while drawing less kW. If so, take excess equipment off line.
- Monitor pumps and motors for excessive vibration and amp draw to detect plugging and excessive wear. Clean and check clearance between impeller and volute. Replace impeller and/or wear rings if necessary.
- Reduce seal water pressure to no more than 10 psi above pump volute pressure.

PLANT WATER SYSTEM FOR NON-POTABLE USE

- Reduce demand—adjust spray nozzles in clarifiers and aeration basins; use quick ON/OFF/adjustable flow nozzles on wash down hoses; adjust pump seal water flow to lowest recommended setting; reduce chlorine gas dilution water flow rate.
- Fix piping leaks.

- Eliminate piping restrictions, throttling valves, unnecessary valves, sticking check valves.
- Tune pump control system—adjust pressure set point to minimum needed.
- Install accumulator pressure tank to allow system to turn off when there is no demand.
- If pump produces excessive pressure, consider eliminating a pump stage.
- If pump produces excessive flow or head, consider trimming impeller.
- Identify most efficient unit (GPM/kW) and program controls to run that unit as primary unit.
- Monitor SCADA System to identify if 2 or more pumps operate at reduced speed. Determine if one unit at higher speed will satisfy demand while drawing less kW. If so, take excess equipment off line.
- Monitor pumps and motors for excessive vibration and amp draw to detect plugging and excessive wear. Clean and check clearance between impeller and volute. Replace impeller and/or wear rings if necessary.
- Program SCADA system to display total daily usage and to alarm for excessive use of plant water.

UV DISINFECTION SYSTEM

- Replace lamps with low pressure, high output lamps, if possible.
- Keep lamps clean and remove scaling.
- Program light bank control for ON/OFF operation and intensity variation in proportion to plant flow.
- Check quarterly that UV intensity meter, water turbidity meter, and flow meter are clean, calibrated, and operating correctly.

ODOR CONTROL SYSTEM

- Reduce air flow to minimum needed to control odor and corrosion during warm weather.
- Consider turning system off during cool weather when odor production is minimal.

- Consider using odor monitoring equipment to automatically control the system.
- For biofilters, measure air pressure of each distribution pipe at a set SCFM blower flow rate, to detect piping resistance, and to determine if filter media is compacting and needs to be changed.

MOTOR MAINTENANCE

- Measure motor amp or kW draw under normal operating condition and compare with motor nameplate data to determine % motor loading. Upsize or downsize motor to achieve 50% to 100% loading range.
- Consider buying premium efficiency motors or doing *Green Rewind* if motors need replacement.

BUILDING HVAC SYSTEM

- Electric Unit Heaters in process and storage areas and pipe galleries—install timers which will allow no more than 1-2 hours of operation when personnel work in these areas.
- Tune HVAC controls and service units—clean air filters and gas burners; annually, have air conditioning technician check for refrigerant leaks and proper operation of economizers.
- Use automatic thermostats programmed for occupancy schedule—maximum 68°F heating setting and minimum 76°F cooling setting for continuously occupied areas, and maximum 60°F heating setting and minimum 80°F cooling setting for minimally occupied areas; set back temperatures for evenings and weekends; maximum 55°F heating setting for electrical rooms.
- Avoid or minimize simultaneous heating and cooling.
- Consider using infrared heaters which heat surfaces but not the air.
- Lower output of lab fume hood to required minimum. Turn off and close doors or damper when not in use.
- Use timers or occupancy sensors to control ventilation systems.
- Seal leaks at doors, windows, and wall and roof penetrations.

- Increase ceiling insulation and add wall insulation.
- Use waste heat from blower motors, boilers, and engine generators to heat building and water.

LIGHTING

- Check twice per year that optical sensors for indoor and outdoor lights are operating correctly.
- Check twice per year that occupancy sensors are operating correctly. Minimize time delay for shutting lights off.
- Change lighting to more efficient bulbs and fixtures: compact fluorescent lights, T5 fluorescent tubes, and LED outdoor lights.
- Install daylight controls to turn off indoor fixtures when adequate natural light is available.

COMPRESSED AIR

- Fix leaks.
- Reduce pressure setting to minimum needed for air operated equipment.
- Turn off compressor if not routinely needed, such as shop compressor.
- Use compressor VFD control rather than throttling output.
- Use refrigerated cycling dryer rather than continuously operating dryer.

OTHER MEASURES

- Maximize Primary Treatment efficiency, (especially if using anaerobic digestion of solids) via proper baffling and improved hydraulics.
- Maximize solids concentration of WAS and Primary Sludge sent to anaerobic digester to minimize heating requirement and maximize hydraulic detention time.
- Use SCADA System to observe trends, including larger motor kW demand and monthly plant kWh/Million Gallons treated. Use information to tune the controls.
- Use SCADA System to operate only the equipment needed, so blower, pumps and mixer outputs match demands.

- Regularly check for manual overrides (HOA switch in HAND position) so control systems can do their jobs. Fix or tune control systems so manual overrides are not necessary.
- Fix equipment that is not operating correctly or efficiently, such as worn bearings, failed control equipment and sensors, or improperly placed sensors.
- Examine equipment which operates 24/7 or on a fixed schedule, like odor control and ventilation blowers. Adjust operation to meet needs and seasonal variation.
- Rethink *Standard Operating Procedures* to maximize energy efficiency.
- Establish an energy management program which includes an energy champion and energy management team responsible for benchmarking and monitoring plant energy use, auditing plant operation monthly for energy efficiency, and implementing efficiency measures.

WEF Board adopts position statement on renewable energy generation from Wastewater

The Water Environment Federation's (WEF) Board of Trustees approved a position statement on the recovery of resources from wastewater during WEFTEC® 2011. The statement, "Renewable Energy Generation From Wastewater", calls for wastewater-generated energy to be widely recognized as a renewable resource and for a greater drive for innovation in the water sector.

"With the passage of this statement, WEF is encouraging our sector to lead the way in helping communities recover resources from wastewater," said former WEF President Jeanette Brown. "It couldn't be more fitting for this significant step to take place at WEFTEC, which has long showcased progressive thinking

and new ideas in water. Moving forward, we want WEF and WEFTEC to help catalyze the wider adoption of innovative approaches in the water field."

WEF believes that recognizing wastewater generated energy as a renewable resource could have positive, long-term impacts by stimulating greater production from water resource recovery activities, creating more clean energy jobs, and helping to reduce greenhouse gas emissions by alleviating electricity demand from fossil fuel-based power plants. It could also assist advocates in future policy discussions and encourage widespread adoption by making the practice eligible for federal funding.

Many wastewater utilities worldwide are already involved in all areas of renewable energy, from traditional sources—wind, solar, and hydropower—to more innovative approaches such as biomass and emerging technologies. With the energy contained in wastewater and

biosolids greater than the energy required for treatment, wastewater facilities have the potential to be energy neutral or even net energy producers, with some plants having already achieved that status.

WEF believes that reaching the goal of energy neutrality relies upon achieving a holistic energy management approach, incorporating conservation practices, and generating renewable energy through the management of water resource recovery and its by-products.

"WEF leaders believe that emerging technologies can surely advance the potential for renewable energy from wastewater," said WEF Executive Director Jeff Eger. "WEF will work with stakeholders and partners who share our vision for resource recovery and will also help build understanding of the potential role of wastewater treatment facilities. It's exciting to consider where the future could take us in terms of water quality innovation and I'm proud to be a part of that process."

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What Works! Carrier Water

By Ben McConkey, LOTT Clean Water Alliance

The original design for the LOTT Clean Water Alliance’s Martin Way Reclaimed Water Plant did not include carrier water to deliver sodium hypochlorite to the injection points of the reclaimed water stream. The initial feed point for sodium hypochlorite is into a static mixer in the permeate discharge line prior to the contact basins. The control system was set up to adjust the pump feed rate based on the pre-contact chlorine residual using the post chlorine contact residual as a trim setting. The “pre” chlorine contact sample for residual is taken about 30 feet downstream of the static mixer. The treatment plant is a membrane bioreactor (MBR) activated sludge - nitrogen removal design with submerged membranes for separation of permeate from the mixed liquor.

Maintaining a consistent chlorine residual proved virtually impossible. The membranes are set up to operate under a differential pressure for twelve minutes (permeate pumping on) and to relax (permeate pumping off) for one minute. With two bioreactors operating, this effectively means a permeate pump is shutting down and halving the discharge flow of about 700 gpm for one minute every 6.5 minutes or so. The initial drop in flow/

pressure caused the sodium hypochlorite in the vertical section of feed pipe to “dump” into the permeate line, resulting in a large spike in chlorine residual followed by a corresponding dip in residual when the permeate pump restarted. The control system was not able to adjust for these conditions. Typical chlorine residual / pump speed trends are shown in Figure 1.

Two of LOTT’s senior operators, John Bothwell and Terri Prather, got together and rigged up a temporary carrier water system using Class A reclaimed water to deliver the sodium hypochlorite to the pre-contact injection point. The results speak for themselves, as shown in Figure 2. A permanent system was installed and uses about 10 gpm of Class A reclaimed water as carrier water. The use of carrier water in applications such as this where small volumes of chemical are injected into a liquid stream flow has multiple advantages. First, injection of small flows into a liquid stream does not provide the energy to disperse the chemical throughout the bulk liquid, thus leading to poor mixing and localized conditions of over concentration. Secondly, it helps to ensure rapid mixing in the static mixer due to better dispersion of the chemical. This approach can be used throughout the plant whenever feed volumes are low compared to the volume of liquid being treated.

You can contact Ben at benmconkey@lottonline.org.

POMC Chair Dick Finger invites you to get involved in POMC, which has the mission to “develop, recommend, support, and conduct programs to promote the overall understanding of facility activities, including those related to operation, maintenance, and management practices of water quality improvement facilities.” Feel free to contribute an idea for a webinar or a “What Works” article to share and learn about solving plant operations and maintenance problems. Contact Dick Finger at 253-631-3343 or dick.finger@att.net, Vice Chair Dawn Hanthorn at dawnh@medurifarms.com, or Past Chair Ron Moeller at 360-748-8340 or RonMoeller@kennedyjens.com.



Figure 1 without carrier water



Figure 2 with carrier water

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WEF & PNCWA Safety Awards



Paul Proctor and Richard Ludlow (center) received the Burke award for the City of Gresham from Chris Browning (left) and Andy O'Neill

Based on applications received listing 2010 safety records, Veolia Water NA/City of Gresham, OR is the recipient of this year's George W. Burke, Jr. award from the Water Environment Federation. The award was established to encourage active and effective safety programs in municipal and industrial wastewater facilities. For the PNCWA Divisional Awards for zero lost time

records, there was plenty of recognition in Division B for some frequent recipients. The plaque was awarded to CH2M HILL/City of Twin Falls, Idaho. Certificates were awarded to Veolia Water NA/City of Gresham, OR and CH2M HILL/City of Walla Walla, WA. Some familiar names received recognition in Division C, with a plaque for EMC/City of Quincy, WA and certificates awarded to the City of Lynden, WA and the City of Silverton, OR. In Division D, the City of Tacoma/North End was a new recipient of a plaque. Perennial winners in Division E were recognized, with a plaque awarded to the City of Carlton, OR for zero lost time, and certificates to the City of Hoquiam, WA and City of McCleary, WA. And for ten consecutive years without a lost time accident, the City of Lynden, WA received a special recognition plaque.

It's quick and easy to apply for Safety Awards, so what are you waiting for? Start now, and get a pat on the back from your peers—you deserve it. The WEF George W. Burke award application is a short form that you can enhance with supplemental information. The PNCWA divisional awards are for zero lost time the previous year and the application is just one page.

Submit safety award applications online at the PNCWA webpage www.pncwa.org or by hard copy to the PNCWA office.

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PNCWA members who received awards at WEFTEC 2011

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Jon Randall, Justine George, Jim O'Reilly and Bob Fitzgerald of Clean Water Services competed in the Operations Challenge at WEFTEC2011

Camp Applied Research Award: Henryk Melcer

Recognizes a WEF member who demonstrates a unique application of basic research or fundamental principles through the design or development of a wastewater collection or treatment system

Public Education Award: LOTT Clean Water Alliance

For significant accomplishments in promoting awareness and understanding of water environment issues among the general public, through the development of and implementation of public education programs

Operations Challenge, Second place overall Division II: Clean Water Services' River Rangers

Section NEWS

Southwest Idaho Operators Section (SWIOS)

Congratulations to SWIOS 2011 award recipients:

- Operator of the Year—
John Prigge, Sorrento Lactalis
- Collections Operator of the Year—
Juan Pena, City of Nampa
- Laboratory Analyst of the Year—
Karen Griffin, City of Boise
- Corporate Sponsor of the Year—
Rain for Rent (Cody Jensen)
- Member of the Year—
Laurelei Ball, City of Meridian

SWIOS thanks outgoing president Gilbert Flores (Veolia Water, Caldwell) for four years of dedication and service to the members of the SWIOS section. We are pleased to announce our incoming president for the 2012 year, Laurelei Ball (City of Meridian). As always, SWIOS has a full year of CEU approved training classes lined up for its members.

Please join us for our first training class of 2012, *Introduction to Programmable Controllers* (0.3 WW/DW CEUs), presented by Advanced Control Systems on Feb. 15 from 8 a.m. to 1 p.m. at the Meridian WWTP. Please email lball@meridiancity.org with any questions.

SouthEast Idaho Operators Section (SEIOS)

SEIOS has been very busy this year and is working on the Idaho Operators Conference in May at Idaho Falls. We held a well-attended one day training at the Burley CSI campus, offering .6 CEUs. We also held trainings in Island Park and Soda Springs. Both of these trainings had great attendance as well. We are getting ready to bring in new members to the board in December, and choosing our Operator, Collection and Lab people for the year. It has been a great time working with the board members who are all very interested in doing everything we

Section Leaders—email your news and pictures to your Regional Director and copy the newsletter editor, wantlands@cleanwaterservices.org.

can to help section members with the training and CEUs they need for the licenses they hold. Thanks to great sponsors, we have been able to offer trainings with meals at no cost to members.

Olympic Section combined with Southwest at the LOTT learning center on Sept. 8 to learn from Mark Doyle of Associated Specialties and Robert Stuart of Pump Dynamics. The Dec. 7 meeting in Port Townsend will feature Alan Rue of DOE on lab accreditation/microbiology, Pump Tech's Joe Evans with *VFD 101, Energy Efficiency* by Bob Brennand w/Energy Smart and *Pretreatment Do's and Don'ts* by Bob Mackey of Port Townsend. We will also tour the Port Townsend WWTP (14 DOE outstanding performance awards!) and elect an incoming VP. Lunch provided. CEU there!

Lower Columbia Section selected Dave Gehring, senior operator at the City of

McMinnville's Water Reclamation Facility (WRF) for Treatment Plant Operator of the Year. Dave was also selected as Oregon Region Operator of the Year. McMinnville's WRF hosted a Section luncheon and tour where we learned about the ongoing capacity improvements to the collection and treatment facilities. The Section hosted a meet-and-greet happy hour at the Lucky Labrador Pub for socializing and shop talk. The Young Professionals of the Lower Columbia Section are putting together technical tours and social events; students and YPs should contact Dana Devin-Clarke at ddclarke@brwnncald.com. The Lower Columbia Section has Board Positions Open and we want you. If you are interested in actively participating in the Section, please see the Section website at <http://lowercolumbia.pncwa.org/> or contact Joel Borchers at borchersj@cleanwaterservices.org.

Welcome to new members of PNCWA!

The people listed below have become members of PNCWA since our last issue. The list represents both WEF/PNCWA new members and transfers from other Member Associations to PNCWA as well as new PNCWA-only members. Welcome to all of you. Let us know how we can best serve your needs and interests and how you would like to be involved.

Derrek Amburgey, City of Edmonds
R Christopher Anderson, City of Yakima
Sanjay Barik, WA Dept. of Ecology
Johanna Bell, Student
Michelle Cahil, City of Eugene/MWMC
Rick Clark, City of Eugene
Heath Coppedge, Student
Scott Deliberio, Southwest Suburban Sewer District
Joe Dvorak, Clean Water Services
Angie Estey, Trane
Jordi Figueras, Pharmer Engineering
Roger Flint, CH2M HILL

Elizabeth Gillard, Kennedy/Jenks Consultants
Spencer Goodro, City of Eugene
Matthew Green, City of Eugene
Mark Henley, WA Dept. of Ecology
Bill Huhta, Northwest Environmental Training Center
Mike Kebbe, Clean Water Services
Thomas Keown, Kennedy/Jenks Consultants
Louis Kitchens, City of Lynden WA
Liz Li, Student
Ken Loucks, Schier Products Co

Richard Ludlow, Veolia Water North America
Mollie Mangerich, City of Meridian
Aaron Markham, Larch Correctional Center
Ralph Martini, City of Heyburn
Lee McGinnis, South Suburban Sanitary District
Ian McKelvey, Brown and Caldwell
Ted Mikowski, City of Albany
Todd Miller, City of Dundee
Chris Minton, Larry Walker Associates
Nebojsa Mucibabic, HDR Engineering
Brittany Park, City of Redmond

William Pavlich, PACE Engineers
Nicki Pozos, HDR Engineering
Justin Schmidt, G E Roots Division
Wendy Schmidt, Wallis Engineering
Daniel Shafar, Wallis Engineering
Kevin Shults, South Suburban Sanitary District
Robert Smith, Student
Cari Stieglitz, Faithful & Gould
Gary Still, City of Eugene
Don Whitehead, Winzler & Kelly
Angela Wieland, Brown and Caldwell
Kenneth Ziebart, WA Dept. of Ecology

COMMITTEE FOCUS—MEMBERSHIP



Scholarship recipients Larry Littrell, Katie Sheldon and Ryan Rehder with Steve James (2nd from left).

\$4,500 in Scholarships Granted in 2011!

By Steve James, J-U-B Engineers, PNCWA Scholarship Committee Chair

Thanks to the generosity of our PNCWA members and the PNCWA Board, the scholarship fund was able to award three

\$1,500 scholarships in 2011. The committee narrowed the pool of 11 applicants down to our three exceptional winners, all of whom were present at this year's conference:

Larry Littrell—Operator for Lake Stevens Sewer District and vice president of the NW Washington Section. Larry will be pursuing a 4 year engineering degree beginning this fall at Everett Community College.

Katie Sheldon—Currently pursuing a master's degree at Oregon State and interested in storm water treatment

Ryan Rehder—Currently pursuing a graduate degree in civil/environmental engineering at the University of Idaho, focusing on more sustainable waste management practices

Our donors are the real heroes here. Even after awarding these scholarships, our fund balance now sits at a record \$11,100! These funds were raised through individual donations, our annual conference silent auction, and dedicated funds from the PNCWA general fund. We are still a long way from our fund goal of \$150,000 by 2016, but have made a great start!

Please take a minute to thank the following people and companies for giving generously to the scholarship fund. The list represents donations of cash as well as items for the silent auctions:

OVER \$1000

- CH2M HILL
- Doug Allie
- J-U-B ENGINEERS, Inc.
- PNCWA Board
- Veolia Water NA

- Kay Hust
- SSSSS—Select Society of Sanitary Sludge Shovelers
- Walt Mintkeski

- Mike Rainey & Nan Cluss
- Paul Proctor
- Paul Schuler
- Paula Arsenault
- Rick Shanley
- Robert Pailthorp
- Severn Trent

UNDER \$250

- Andy O'Neill
- Anonymous
- APSCO Inc.
- Barney & Worth, Inc.
- Cindy Beckett Kehoe & Gordon Woodward
- Clean Water Services
- In Memorium of John S. Cluss
- Jeanette Brown
- Jeff Eger
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- Jon Herrick
- Marcus Lopez
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- Shawn Redmond
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- Water Quality Lab Analysts Section of W WA
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\$500-\$1000

- Water Environment Federation
- HDR Engineering, Inc.
- Oregon Region
- GE Water & Process Technologies

\$250-\$500

- Richwine Environmental, Inc.
- Adam Zabinski
- AEI Engineering
- Carollo Engineers
- J. Michael and Dia Read

None of this would have been possible without the dedication of the Scholarship Committee. Our hard working Scholarship Committee members include: Adam Zabinski, Karen DeBaker, Dale Richwine, Lynne Chicoine, Erik Coates, Owen Boe, John Poppe and Rick Shanley. Thank you for all of your support!

PNCWA Environmental Stewardship Scholarships

NOT TOO LATE FOR YEAR-END CHARITABLE DONATIONS!

Donations to the scholarship fund are fully tax deductible.

WAYS TO DONATE

- Send checks to:
PNCWA Scholarship Fund
PO Box 100
Hansen, ID 83334
- Make a donation at www.pncwa.org
Click the Scholarships link (on left of homepage)

Costs of workplace accidents and injuries, Part I

By Paul Proctor, Gresham WWTP/Veolia Water NA

As we come to the close of 2011, it is a good idea to look back and review what was accomplished and what we could have done better. Even if you had a perfect year, most likely you experienced some near misses. A list of do's and don'ts is not enough to bring safety into the workplace as a dynamic and ever improving mission. It is good to understand the cost of safety, or the cost of not being safe. Accidents and injuries at work have the direct impact of the pain, suffering and cost related to returning a worker back to 100% condition, the family, and the extra workload placed on coworkers who have to pick up the extra duties. When you consider that millions of American spend almost 40–50% of their day at work, it is no surprise that thousands in our field go to work each day and return home injured. I cannot imagine any person goes to work thinking this will be my last day of good health or my last day on earth, and yet it happens—too often. Not only is there the obvious cost of lost work, compensation and medical cost involved, there are many hidden costs associated with workplace accidents and injuries.

The obvious direct costs of workplace accidents and injuries involve the immediate cost of treatment, associated medical costs, hospital and physician bills, occupational therapy, prescription medicine and medical equipment. Most workers' compensation insurance will cover these direct costs. Federal law requires most businesses with five or more employee to carry workers' compensation insurance, but this may not apply to part-time workers. Indirect costs associated with workplace accidents and injuries include damage to equipment, loss of work time, and cost to hire and train a permanent or temporary replacement, and potential increases in the employer's insurance premium. Indirect costs can exceed direct costs by up to 30 times depending on the accident.

Companies that focus on safety programs tend to have fewer accidents, better employee morale and increased productivity. Many companies offer incentives for no workplace safety incidents, but this may encourage employees not to report minor accidents or injuries to earn the reward.

Other costs of workplace accidents and injuries may include legal services if the employee sues the company, accident investigation, implementation of measures to correct causal factors, and perhaps more safety training. The first annual Liberty Mutual Workplace Safety Index listed ten leading causes of injuries and illness that account for 86 percent of the \$38.7 billion in wage

and medical payments employers paid in 2008 (the last year data is available), and provided guidelines to reduce them. Based on claims and data from Bureau of Labor Statistics and the National Academy of Social Insurance, the Safety Index found the top problem is overexertion or injuries caused by excessive lifting, pulling, pushing, holding, carrying, or throwing an object which resulted in \$9.8 billion in direct costs. Repetitive motion injuries accounted for \$2.3 billion.

When the indirect cost of workers' compensation claims are added to the \$38.7 billion in direct costs identified by the report, the total economic burden of workplace injuries and illness is far greater, with estimates ranging between \$125 billion to \$155 billion.

This is Part 1 of a 2-part article to be continued in the next newsletter.

You may contact Paul Proctor, a project manager at the Gresham WWTP at paul.proctor@veoliawaterna.com.

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Adopt-a-School Awards



2010-2011 school projects pictured above: Century High School, Hillsboro Oregon (top left), North Albany Middle School, Albany, Oregon (top right) Rachel Carson Environmental Middle School, Beaverton, Oregon (bottom)

By Karen DeBaker, Clean Water Services,
PNCWA Public Education Committee Chair

Thanks to the support of PNCWA members and attendees of the Public Communications workshop, we have awarded \$5,000 to students who will engage in water-related studies during the 2011–2012 school year. Congratulations to these schools for their exciting projects!

- Albany Options School, Oregon
\$350 for Plant Science/School Swale/Service Learning
- Aloha High School, Oregon
\$700 for Schoolyard Habitat along Butternut Creek
- Ashland Middle School, Oregon
\$700 for Rain Garden & Wetland Project
- Century High School, Oregon
\$100 for Honors Biochemistry Research Projects
- Corvallis High School, Oregon
\$500 for Dixon Creek Restoration
- Gordon Russell Middle School, Oregon
\$500 for Water Slope Slowdown
- Kings Valley Charter School, Oregon
\$850 for Maxfield Creek Restoration
- Mountain View High School, Idaho
- \$500 for Hyatt Lakes Reserve Water Quality Monitoring Project
- South Eugene High School, Oregon
\$300 for Principles of Environmental Science
- South Kitsap High School, Washington
\$400 for Integrated Science Program
- Washington Middle School, Washington
\$100 for LOTT Field Trip



WATER LEADERSHIP INSTITUTE

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www.water-leadership-institute.org

Purpose Statement

The Water Leadership Institute program is aimed at educating, training, and providing opportunities that enable developing and emerging leaders to build strong lasting relationships within the water industry. This intensive program allows participants the opportunity to engage in management training, and leadership development through a blended learning approach that includes the examination of complex challenges facing the water and wastewater industries and networking with public and private sector practitioners. Participants will build skills and knowledge needed to effect change within their organizations.

Syllabus Topics Include:

- Mega Trends and Challenges Facing the Water Industry
- Communication, Volunteerism, and International Connections
- Networking and Managing Relationships – Internal and External
- Entrepreneurship and Innovative Financing
- Professionalism, Advocacy, and Charity
- Sustainability and International Issues
- Crisis Management and Public Relations
- Strategic Leadership

Please visit the website for a syllabus summary and FAQs about the institute.

Applications for the Institute are due January, 15, 2012.

The Institute is conducted by the Water Environment Federation and endorsed by the American Water Works Association.

From the Office

By Nan Cluss, PNCWA Manager



Nan Cluss

WEFTEC is the largest annual water quality event in the world. This year, there were 18,000 attendees from more than 70 countries. I can't always attend, but this year I once again had the opportunity to be inspired on so many levels by being a part of it.

First was the Sunday PNCWA reception. What a great turnout! Our members certainly have no problem keeping the conversations flowing. Thanks to this year's reception sponsors

(APSCO, Brown and Caldwell, Beaver Equipment, GE, Goble Sampson, HDR, Kennedy/Jenks, Pure Air Filtration and Wm. H. Reilly) for providing this great opportunity for interaction.



"WATER'S WORTH IT"—the new public awareness campaign WEF is developing to spread the word about the value and importance of water—was introduced on Monday. By using various keywords to define what the "it" means (e.g., My Effort, Your Respect, My Health, Our Future), the campaign will illustrate the connection between water and our actions, attitudes and the things we value most. Plans include a campaign website and a full suite of materials that will emphasize very basic ideas about how water is inextricably tied to our quality of life. "WATER'S WORTH IT" will launch in March 2012 and WEF Member Associations, utilities and other interested parties will be encouraged to incorporate it as a part of their own tools to enhance public awareness.

A hot topic of the MA Professional Staff Luncheon was the book *Race for Relevance*. It challenges standard association

management practices, and asks that we think about new and different approaches to managing our associations. It says, "More than ever, the way associations become more successful is to help their members do the same." How to do that in today's work environment is the book's focus, offering "radical" changes to some outdated association practices. My copy just arrived and I'm looking forward to what it has to offer.

Tuesday's Leadership Day had a focus on communications. Jack Dozier, Georgia AWP executive director, shared information on how to respond when approached by the media. Jack explained how crafting the right message can help turn the moment into public education opportunities. Terry Cole, communications practice director at Jacobs Engineering Group, offered techniques for honing messages and crafting a story that will stick with a public more focused on reality television than reality itself. She stressed that if you're developing messaging for the "general public" you need to break that down into audience subsets and develop your messaging from there. Focus on the bottom line first; relate it to a person's own experience; tie it to something concrete; then tell a story.

I went to a session designed for elected officials on Wednesday. A combination of classroom instruction and exhibit floor exposure offered policy makers (and budget decision makers) a better understanding of wastewater fundamentals. A morning session entitled *Decisions Facing Public Officials in the Next Five Years* was also a part of a larger agenda to provide appropriate-level information to elected officials who are an important part of the wastewater landscape.

The nature of WEFTEC is that regardless of your position in the world of water, there is vast opportunity for learning and interaction. With WEFTEC's online planner tool, you can create a highly specialized agenda just for you. If you have never attended, I hope you will have the chance sometime. It's inspiring.

PNCWA Newsletter Submission Guidelines

Upcoming focus topic:

2012 Q1 Threats to Water Quality—deadline February 15

The PNCWA quarterly newsletter is built on articles contributed by PNCWA members. Each issue has a focus topic selected by the PNCWA Board and refined by the Editorial Advisory Group to address technical, community-based, case study and regulatory themes. If you have a story idea or an article to submit, please use the following guidelines.

- 200 to 500 words (longer articles may be accepted, space permitting)
- No overt marketing, but it's fine to talk about your company's achievements
- High resolution color photos or graphics, if possible
- Provide author email for readers to contact

Please submit articles to Sheri Wantland at wantlands@cleanwaterservices.org

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FOR MORE INFORMATION, PLEASE CONTACT:

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PNCWA 2011
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PNCWA2011 Conference Highlights



TOP ROW (PICTURED LEFT TO RIGHT)

PNCWA2011 Technical Program Chair Court Harris, CH2M HILL
5S inductees were Shannon Ostendorff, Dan Hanthorn, Doug Allie,
Bruce Clouser, Chris Browning and Dr. David Jenkins
Opening Session speaker Dr. David Jenkins and Joan Jenkins
Max Hildebrand, Kimberly and Doug Allie, and Stephanie and Rick
Shanley with WEF Treasurer Chris Browning on a social outing
prior to the conference
Conference photographer Cindy Kehoe with exhibitor Tim Owens

2ND ROW FROM TOP (LEFT TO RIGHT)

Primary Sponsor Brown and Caldwell (Cyndy Bratz)
Tertiary Sponsor GE (Jason Diamond)
Primary Sponsor Kennedy/Jenks (Ron Moeller)
WWTF tour

3RD ROW FROM TOP (LEFT TO RIGHT)

Primary Sponsor J-U-B Engineers (Mark Holtzen)
PNCWA2011 Conference Chair Susan Gierga,
Murray, Smith & Associates
Opening Session speaker John McGettigan of AECOM and WEF

Executive Director Jeff Eger

PNCWA past presidents John Shawcroft, Andy O'Neill, Ron Moeller
and Mark Walter

BOTTOM ROW (LEFT TO RIGHT)

Tertiary Sponsor HDR (Haley Falconer)
Primary Sponsor Parametrix (Paul Bucich)
Dick Finger, presenter of Water Reuse awards
Young professionals Kiana Eller, Katie Sheldon, John McGettigan,
Michelle LeBaron, Beryl Fredrickson, Alex Sylvain
(all of AECOM, except Katie Sheldon)

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PNCWA 2012

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REMINDER:

Call for abstracts for the PNCWA annual conference
deadline is **March 16, 2012**. No extensions this year!

See page 10 for details

Annual Conference & Exhibition
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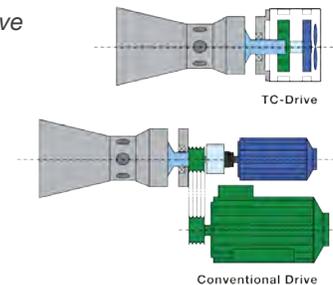


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