Pacific Northwest Clean Water Association

PNCWA

Newsletter
Winter 2010

YEAR END VOLUNTEER THANK YOU
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FEATURE FOCUS: WET WEATHER ISSUES
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PNCWA2010 HIGHLIGHTS
Awards, Ops Challenge

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Back Row: Vic Coles, Gil Bridges, Shawn Redmond, Rex Moffat, Bill Strait, Al Chrisman; Andy O'Neill, Matt Chasteen, Rob Peacock, Robert Jones, Travis Capson, Mark Walter, Bud Ruther, Mark Poling

PNCWA is made up of people doing a great job. Want to see your organization's great people on this page? If you are a PNCWA member, please email your high resolution photo to mikerainey@pncwa.org, with the names and location of the photo. Contact the PNCWA office for assistance.

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DEPARTMENTS

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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.

VISION STATEMENT

The Pacific Northwest Clean Water Association will ensure clean, sustainable watersheds for future generations.

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PNCWA NEWSLETTER

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An important benefit of being a PNCWA member is the opportunity to contribute regionally and nationally to the water industry. Over the last few years regulatory agencies have invited input from PNCWA and the Water Environment Federation (WEF) to aid in their vision of promoting sustainable water infrastructures.

In 2006, WEF collaborated with five leading national water organizations and the Environmental Protection Agency (EPA) in developing a joint strategy for identifying and encouraging excellence in water and wastewater utility management. Selected members made up the Effective Utility Management Steering Committee. The culmination of this joint venture, Water Sector Collaboration on Effective Utility Management, was published one year later and can be seen as the catalyst for multiple EPA initiatives.

In the spring 2009 PNCWA Newsletter, EPA Region 10 announced that EPA was developing a Sustainable Infrastructure Initiative that addressed the infrastructure funding gap and the possibility of linking sustainable infrastructure to climate change. Now, less than two years after PNCWA first published the article related to a new EPA initiative, a statement of policy was adopted by EPA on October 4, 2010. The Sustainable Infrastructure Initiative produced what is now known as the EPA's Clean Water and Drinking Water Infrastructure Sustainability Policy.

EPA's requests for Clean Water State Revolving Fund (CWSRF) appropriations within the President's 2011 budget reflect the four priorities of the newly adopted policy.

1. Promoting planning processes that support sustainability – Beyond the planning processes of protecting public health and ensuring water quality, the planning portion of the policy identifies climate change considerations, conservation of natural resources, and "green" alternatives. While planning for sustainability, utilities should evaluate rates, define their desired levels of service, and maintain an asset management program that can identify life cycle costs.

PNCWA President
Andy O'Neill
Rural Community Assistance Corporation

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In the Safety Spotlight — A Profile of the CH2M/City of Twin Falls, ID WWTP

By Steve Hanenburg, Chambers Creek WWTP

The CH2M HILL/City of Twin Falls, Idaho wastewater treatment plant has received the 2009 George W. Burke Award, which it also won in 1998. The staff also received a PNCWA Division B award in 2008, and four awards from the National Safety Council from 2007 to 2009. This safety program repeatedly excels at protecting the health and safety of its staff.

Twin Falls safety team

System Characteristics

The collection system includes 8 lift stations and 250 miles of sanitary sewer. City of Twin Falls staff maintain the sewers. CH2M staff operates and maintains the lift stations, a 2.5 mgd Upflow Anaerobic Sludge Blanket (UASB) and the 8.56 mgd wastewater treatment plant. The treatment plant's average flow is 7.15 mgd and discharges to the Snake River. The treatment processes include a headworks, grit removal, two primary clarifiers, four aeration basins, three secondary clarifiers, and UV disinfection. A Biotower was demolished and replaced with Chemical Enhanced Primary Treatment for greater phosphorous removal. A Gravity Belt Thickener enhances solids dewatering prior to anaerobic digestion. Belt filter presses dewater the Class B biosolids.

EPA enforces effluent limitations for phosphorous compounds for the protection of the receiving stream. Good performance from the system requires consistent operation, good process control, and significant instrumentation and automation.

Staff Description

A total of 20 operators, maintenance, laboratory, and administrative staff operate and maintain the collection and treatment systems. Seven operators work at the treatment plant, six maintain the mechanical equipment, three perform analytical procedures,

and three people handle administration. The Pretreatment Coordinator is also the Project Safety Team Leader (PTSL) and manages biosolids land application.

Safety Program Structure

The Safety Committee consists of six employees representing each of the departments. The committee meets monthly and reviews old and new business, unsafe conditions, JSAs, SOPs, and monthly inspection of the facilities. Committee activities are led by the PTSL. An annual training and inspection schedule are followed. Each associate has an opportunity to perform monthly inspections and be involved with the training.

OSHA 300 reports, incident and near miss reports, training documentation, unsafe conditions/unsafe act reports, and records of all monthly meetings are filed at the plant and copies are forwarded to the Regional Safety Coordinator and the Corporate Safety Coordinator. The Regional Safety Coordinator conducts an annual inspection.

Written Plans

Specific policies established in written plans have been adopted for New Employee Orientation, Accident Prevention, JSA, Blood borne Pathogens, Hazard Communication, Confined Space Entry, LOTO, PPE, Emergency Action Plan, Heat & Cold Exposure, Respiratory Protection, and Hearing Conservation.

Cell phones are used for normal and emergency communication.

Safety Training

The PTSL, all other staff, and other agencies are involved in providing safety training. "Safety shorts" occur daily and at the start of each meeting, and more in-depth training is provided monthly. Training topics include: PPE, Blood borne Pathogens, CSE, LOTO, Fall Protection, Defensive Driving, lifting, boom trucks and cranes, earthquake, Flagging and Traffic Control, ladders, First Aid/CPR/AED. All 20 employees are CPR certified.

Lead mechanic Harry Stites performing LOTO.

Operator Attitudes

All operations staff fully embrace the safety program, including the application for VPP status. All employees participate in providing safety training. Congratulations to the staff of the Twin Falls WWTP.

Congratulations Jeanette DeCastro, First PNCWA Scholarship Recipient

Jeanette DeCastro accepting scholarship award from Steve James

This was a big year for PNCWA as we awarded our first annual scholarship to one of our own, PNCWA member Jeanette DeCastro who exemplifies PNCWA's passion for clean water, problem solving, and community service. Currently working with Portland's Bureau of Environmental Services and as a former AmeriCorps volunteer, she has had many opportunities to experience the benefit of clean water and the rewards of serving our larger community. Jeanette received the $1,500 scholarship at PNCWA2010 in Bend. She will complete her A.A.S. at Portland Community College, after which she hopes to pursue a B.S. in Civil Engineering at Portland State University.

In 2010 the PNCWA scholarship was available to PNCWA members and family members. Criteria will most likely change to include a larger scope of applicants as our scholarship funds grow. Applications for the 2011-2012 school year will be available by March 2011. For more information, please contact Nan Cluss at the PNCWA office.

Scholarship donations off to a great start!

2010 was the first full year of fundraising for the PNCWA scholarship program and was helped substantially by individual donations. PNCWA has raised $3,630 through personal and corporate cash donations including $2,485 at the annual conference in Bend. The donations were headed by our scholarship "Pioneers" who donated at least $500 to the fund: Doug Allie, Veolia Water, J-U-B Engineers, Inc., GE Water, and CH2M HILL.

A number of individuals have contributed generously including: Nan Cluss and Mike Rainey, Robert Pailthorp, Adam Zabinski, Steve James, Rick Shanley, Andy O'Neill, John Shawcroft, Jon Herrick, Jeanette Brown, and Paula Arsenault.

These donations will help fund the 2011 scholarships and build the PNCWA scholarship foundation. For more information about giving to the PNCWA Scholarship fund, please contact Nan Cluss at the PNCWA office.

First Annual Scholarship Silent Auction Success!

The first annual PNCWA Scholarship Silent Auction was a huge success at this year's conference thanks to the support of so many people. On Monday, the PNCWA faithful looked, bid, and then bid again for items ranging from ski trips to Pez dispensers to tools to boutique wines. Everyone had fun bidding and got some great deals, all for a good cause. Our 17 donors provided 26 auction items that brought in $2,795 for the scholarship program. We would like to especially thank our donors without whom this would not have been possible:

APSCO Inc.

Carollo Engineers

CH2M HILL

Clean Water Services

Gordon Woodward and Cindy Beckett Kehoe

HDR

John Poppe

J-U-B ENGINEERS, Inc.

Michael and Dia Read

Paul Schuler

PNCWA

Richwine Environmental, Inc.

Severn Trent

SW Washington Operators Section

Veolia Water

Walt Mintkeski

Water Environment Federation - Linda Kelly

By popular demand, the auction will return next year at the annual conference in Vancouver, Washington. If you are interested in donating, would like auction item ideas, or want to volunteer, please contact Steve James at sjames@jub.com .

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Asset Management: Barriers and Controls

By Marc Yarlott, Asset Management Committee Chair

This fall I attended three conferences, each with a unique perspective, but with a common theme focused on: 1. recognizing that water is central to the human existence; 2. visioning a different future; and, 3. taking innovative action to make cities and their infrastructure more sustainable.

At WEFTEC2010, the opening general session speaker was Steven Solomon, an economics journalist whose new book is WATER: The Epic Struggle for Wealth, Power, and Civilization. His presentation focused on water as central to human civilization's survival, and water's very close tie with energy and ultimately national security. As the world population grows, development of water resources will be a growing focus of civilization to support food and energy development. WEF has published the presentation at: http://www.weftec.org/video/ogs2011.html.

In Montreal at the International Water Association (IWA) World Water Congress, I attended Cities of the Future, a session that identified the key features of a sustainable city and ways to transition from unsustainable to sustainable solutions through a process of visioning. Envisioning a future where different actions achieve different results is a powerful strategy, which has been very successful in Australia. From this session came the Montreal Declaration, an IWA commitment to "elevate the role of water management as a central element of sustainable, resilient cities." (http://www.iwahq.org/MainWebSite/Resources/Document/Draft_Montreal%20Declaration_CoF_Nov%202010.pdf)

Coincidentally, my employer Veolia Water North America presented the Water Impact Index, a great tool to evaluate "visioning" exercises. The Index helps calculate the water and carbon impact of most human activities, which is key to evaluating master planning and purchasing decisions. The Water Impact Index enables a comprehensive assessment of the impact of human activity on water resources. Veolia's Water Impact Index information can be found at: http://www.veoliawaterna.com/sustainable/water-impact-index/ . This paper includes a company study believed to be the first-ever simultaneous analysis of water and carbon on a major metropolitan area's water cycle, a great example of how to evaluate the alternate envisioned futures.

Despite the inspiration of WEFTEC and IWA conferences, I found the very best examples of recognizing the importance of water, visioning with stakeholders, and then taking innovative action much closer to home at PNCWA's annual conference. The City of Bend and Deschutes Brewery collaborated on innovative ways to support the brewery's aggressive growth plan with minimal impact to the City's existing asset infrastructure by carefully timing flows from the brewery during traditional low flow periods. This presentation was an excellent example of the paradigm shift toward better water asset management in the Cities of the Future.

My favorite definition of Asset Management is, "Sustainable management of the 'public trust' assets that preserve the nation's water quality both today and long term." This perspective fits very nicely with the themes from WEFTEC, IWA, and our local conferences and highlights that the job of Asset Managers is to take an "out of the box" perspective to our decisions about the assets we manage.

Marc Yarlott can be contacted at: marc@wllcamg.com

Water Environment Federation Announces New Executive Director

The new Executive Director of the Water Environment Federation (WEF) is Jeff Eger, who has served since 1994 as the executive director of Kentucky's second largest public sewer utility, Sanitation District 1 (SD1) in Fort Wright.

"It is with great excitement that we announce Mr. Eger's addition to our team," said WEF President Jeanette Brown. "We are fortunate that someone with Jeff's leadership experience and creativity is taking up the torch to represent WEF as it faces the next generation of environmental challenges."

SD1 is recognized as a national leader in terms of embracing and implementing green infrastructure in wet weather control strategies, advocating for legislation and policy change on the state and national levels, and using adaptive watershed management in controlling and managing storm water.

"We look forward to continuing WEF's visionary thinking and inspired leadership as Jeff comes on board," continued Brown. "The WEF Board was particularly impressed by his credentials in working with water regulations and stormwater issues."

During his tenure, Eger developed and implemented a regional stormwater management program to comply with U.S. EPA's regulations, and began taking responsibility of public stormwater collection systems in 2009. He also supervised the regionalization of 30 municipal sanitary sewer systems in response to pending federal environmental regulations and legislative changes.

Eger, who holds a Communications degree from Northern Kentucky University, has vast experience in working with organizations active on the regional and national levels. He is a member and past chairman of The Ohio River Valley Water Sanitation Commission, the water pollution control agency for the Ohio River and its tributaries. He also chairs the Wet Weather Partnership, a national organization dedicated to seeking environmentally responsible solutions to urban wet weather issues.

"Through the strong leadership of the SD1 Board of Directors and staff, the organization has proven that an innovative and a cost effective plan can be developed to manage the vital wastewater and stormwater infrastructure in Northern Kentucky," Eger said. "I look forward to promoting the concepts we pioneered here on a national and international platform. WEF's leadership, staff and Member Associations are committed to promoting the mission of preserving and enhancing the global water environment. I am honored to be part of this important mission."

Eger will assume his new role on January 24, 2011, a position currently held by William (Bill) Bertera since 2001.

What Works!

By Richard Finger, POMC Committee Member

Given the time of year, most of you are thinking about the holidays and the impacts of high flows on your facilities. But for this issue of "What Works!" we are thinking further out because it won't be long before we are dealing with warm weather and summer low flow conditions. We all enjoy the warm summer weather, including the "bugs" that generate hydrogen sulfide (H2S) that can create odors and significant public relations problems. No operator would prefer to be dealing with odor complaints rather than attending to the operation of their facility, so any ideas that can help limit odors are good ideas.

H2S in solution is not a problem, but odors result when it is released by turbulence in the wastewater. With the warm wastewater temperatures and lower flows, H2S levels may rise in the primary clarifiers where long detention times can create anaerobic conditions. As the flow discharges from the clarifier, there is an excellent opportunity for odor release.

The operators at the Greeley, Colorado, Water Pollution Control Facility came up with a way to reduce odors during summer months when influent flows are low and H2S is released as primary effluent overflows the weirs into the trough. To limit the cascading effect and resulting odors, the operators install old gates as weirs in the effluent trough (see photo). The water level is raised, the

effluent has less distance to fall, and turbulence is greatly reduced, thus significantly reducing the release of H2S.

Of course, the temporary weirs are removed before higher flows in the winter, but during the summer months the odors are greatly reduced. This is a simple, yet elegant solution that can be easily implemented, although it will take some time to set up.

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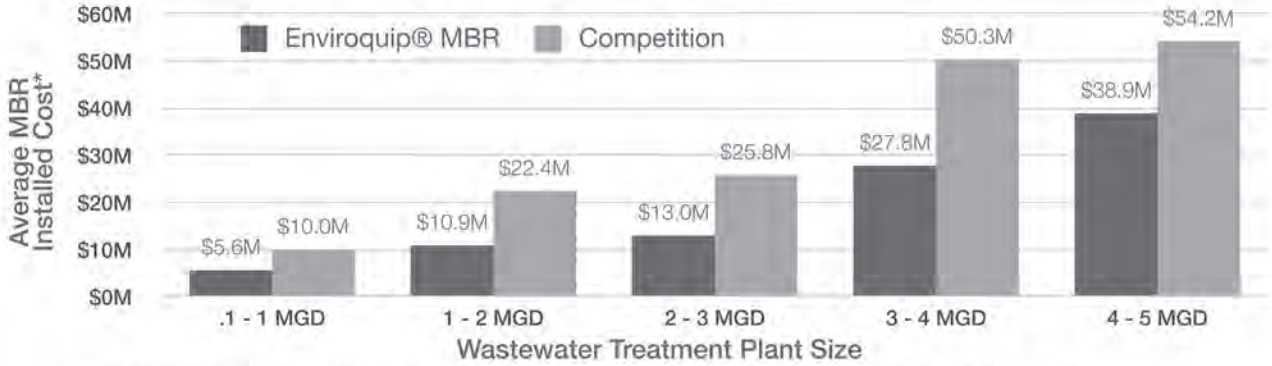

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And the Winners are...

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Steve James, Arthur Sidney Bedell Award for extraordinary personal service to PNCWA

Jon Herrick, William D. Hatfield Award for outstanding performance and professionalism of a wastewater treatment plant operator

John Keady accepting the George W. Burke, Jr. Safety Award given to CH2M HILL/OMI Twin Falls, ID

Ralph Martini, Idaho Operator of the Year

Dave Buckwald, Oregon Operator of the Year

Terry Sackett (accepted by Shane Macuk), Oregon Collections System Operator of the Year

Bruce Clouser, Lyman Ketcham Award for an outstanding contribution in the field of wastewater collection system maintenance and operation

Dan Grogg , Washington Operator of the Year

Dan Lostutter (accepted by Jeremy Coles), Idaho Collections System Operator of the Year

PNCWA2010 Awards Banquet Winners (continued)

Jack Bennion, Individual Distinguished Achievement Award for distinguished service rendered in the interest of pollution abatement and contributions to the advancement of the industry

Mark Poling accepts the Sustainability Award given to the Durham Influent Pump Station (Clean Water Services), a project that showcases sustainable design elements

Outgoing WEF Delegate, Michelle Burkhart

Outgoing President Award to John Shawcroft

President's Award to Gilbert Sanchez (accepted by Owen Boe)

Outgoing Oregon Regional Director Max Hildebrand

Presidents Award to Lynn Moser (accepted by R.J. Lake)

Conference Chair, Susanna Leung

Jennifer Belknap-Williamson, PNCWA Young Professional of the Year Award for significant contributions to PNCWA and to the wastewater collection and treatment industry

Dale Richwine, Individual Distinguished Achievement Award for distinguished service rendered in the interest of pollution abatement and contributions to the advancement of the industry

Operations Challenge First Place: Clean Water Services' River Rangers (l to r - President John Shawcroft, Bob Fitzgerald, Tom Thorson, Carlo Spani, Hunter Tibbals and Mark Poling)

WEF President Jeanette Brown

First All Female Operations Challenge Team ever - Catherine Dummer and Dawn Hanthorne; not pictured: Dana Devin-Clarke and Vanessa Adams

5S New Members: Haley Falconer, Karen DeBaker, Shirley Carter, Susanna Leung, Randy Schwartz, Bill Reilly, Tim Williams

Water for People Chair, Irene Wall

Tertiary Sponsors: HDR (David Keil); J-U-B (Steve James); Carollo (Rick Shanley); GE (not pictured)

Secondary Sponsor: Kennedy/Jenks (Ron Moeller)

Primary Sponsors: Parametrix (Allan Maas); Brown and Caldwell (Cynthia Bratz); MWH (not pictured)

2009 WEF & PNCWA Safety Awards

35 Years Zero Lost Time, City of Hoquiam, WA (accepted by Al Gregory)

Safety Division B, City of Gresham, Oregon (accepted by Paul Proctor)

Congratulations to the City of Hoquiam WWTP for achieving a very significant milestone in safety program effectiveness, 35 years of zero lost time. Lead Operator Al Gregory accepted the award at the PNCWA2010 Annual Conference .

Special commendation was awarded to the City of McCleary, WA for 15 years of zero-lost-time performance, and the E.M.C./City of Quincy, WA for 5 years of zero-lost-time performance.

The PNCWA Divisional Awards for the 2009 calendar year were distributed to the following cities and utilities with exemplary safety performance including zero-lost-time.

The Division A (greater than 75,000 hours worked) plaque went to Veolia Water NA/ Vancouver.

The recipient of a plaque for Division B (20,000-74,999 hours worked) was Veolia Water NA/ Gresham, Oregon WWTP. Certificates of commendation were received by the City of Walla Walla/CH2M.

The Division C (10,000-19,999 hours worked) plaque went to E.M.C./City of Quincy, WA, and certificates of commendation were awarded to the City of Lynden, WA WWTP and the City of Silverton, OR WWTP.

The recipient of the plaque for Division D (5,000-9,999 hours worked) was Burley, ID. Receiving certificates of commendation were the City of Carlton, OR and the City of Kalama, WA.

And receiving the plaque for Division E (<5,000 hours worked) was Veolia Water NA/City of Cle Elum, WA. Certificates of commendation were received by the City of McCleary, WA; Suquamish WWTP/Kitsap County, WA; Kingston WWTP/Kitsap County, WA; and Hoquiam, WA.

Congratulations to the City of Twin Falls, ID CH2M/OMI for receiving the 2009 George W. Burke Award from the Water Environment Federation. The staff at the WWTP are participating in the VPP (Voluntary Protection Program) which was developed by OSHA. The staff at CH2M had a distinguished record of JSA, tailgate meetings, monthly team meetings, in-plant inspections, recordkeeping and reporting, staff training, and zero-lost-time in 2009. Unsafe conditions, near misses and incident reports are reviewed and analyzed. Each day before work even begins staff participate in a short meeting when JSA, SOPs, and MSDS are reviewed. Staff publish a monthly newsletter devoted to safety & occupational health issues. Safety equipment checklists are used for every aspect of operation and maintenance. The staff are truly deserving of this prestigious WEF award.

Safety Award 1 Year, Walla Walla, Washington (accepted by Bud Ruther)

Burke Safety Award, Twin Falls, Idaho (accepted by John Keady)

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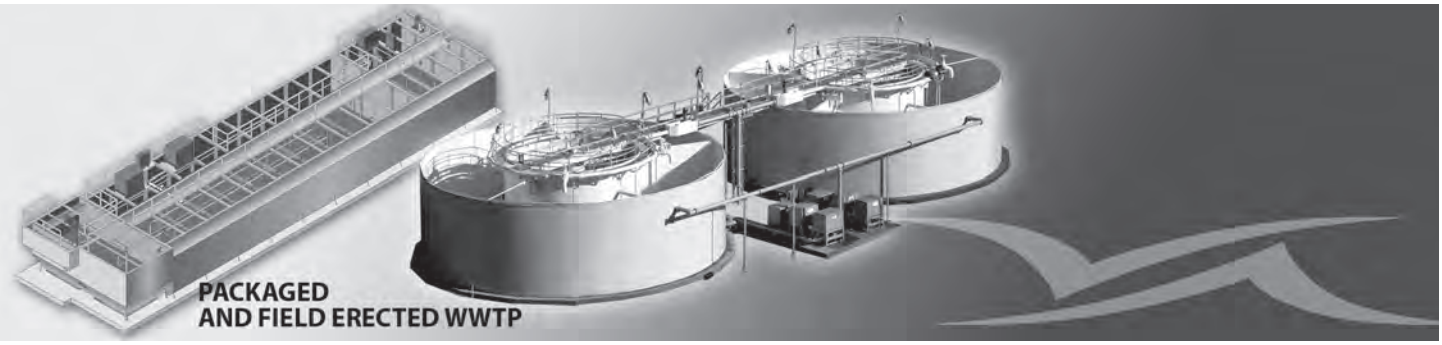

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Infiltration & Inflow: Source Identification

By Dennis Galinato, P.E., Murray, Smith & Associates, Inc.

East of the Cascades and in the intermountain west, annual precipitation can be 10 inches or lower. Yet even in these semi-arid climates, Infiltration and Inflow (I/I) can have significant effects on wastewater collection and treatment system capacity.

Murray, Smith & Associates, Inc. (MSA) has recently monitored I/I effects for several wastewater utilities in semi-arid climates, including the Cities of Twin Falls, Idaho Falls, Pocatello, and Meridian, Idaho, and MSA is currently developing a monitoring plan for the City of Bend, Oregon. This article summarizes some of the approaches used to determine I/I effects for these utilities.

Infiltration/Inflow

Inflow describes the direct flow of stormwater runoff into the wastewater collection system through manhole lids or stormwater related cross connections. Infiltration describes the flow of groundwater into the system through cracks or holes in manholes, service laterals, and main lines.

Timing is Key

Several factors to consider when monitoring for I/I in these types of climates is that much of the precipitation that falls as rain occurs between March and June, and failure to monitor flow during this time period may lead to losing a full year when trying to capture inflow effects. Infiltration effects are often caused by rising groundwater tables during the irrigation season. In the inland northwest, the irrigation season is typically Mid-March through Mid-October.

Wastewater Treatment Plant Data

Flow recorded at the Wastewater Treatment Plant (WWTP) can be used as an overall indicator of I/I. If an influent meter is available, it can be used to detect inflow responses that are large enough to be indicated even after attenuation throughout the entire system. In many cases, however, the WWTP will only have an effluent meter. In these cases, recycled process water combined with detention within the individual WWTP facilities can attenuate and modify the diurnal flow pattern. As a result, WWTP effluent data typically should not be used to measure the short response time flow impacts associated with inflow. The WWTP effluent measurement can be used to study the general trend of flow magnitude throughout the year, which can be used to estimate the effect infiltration has on the wastewater collection system.

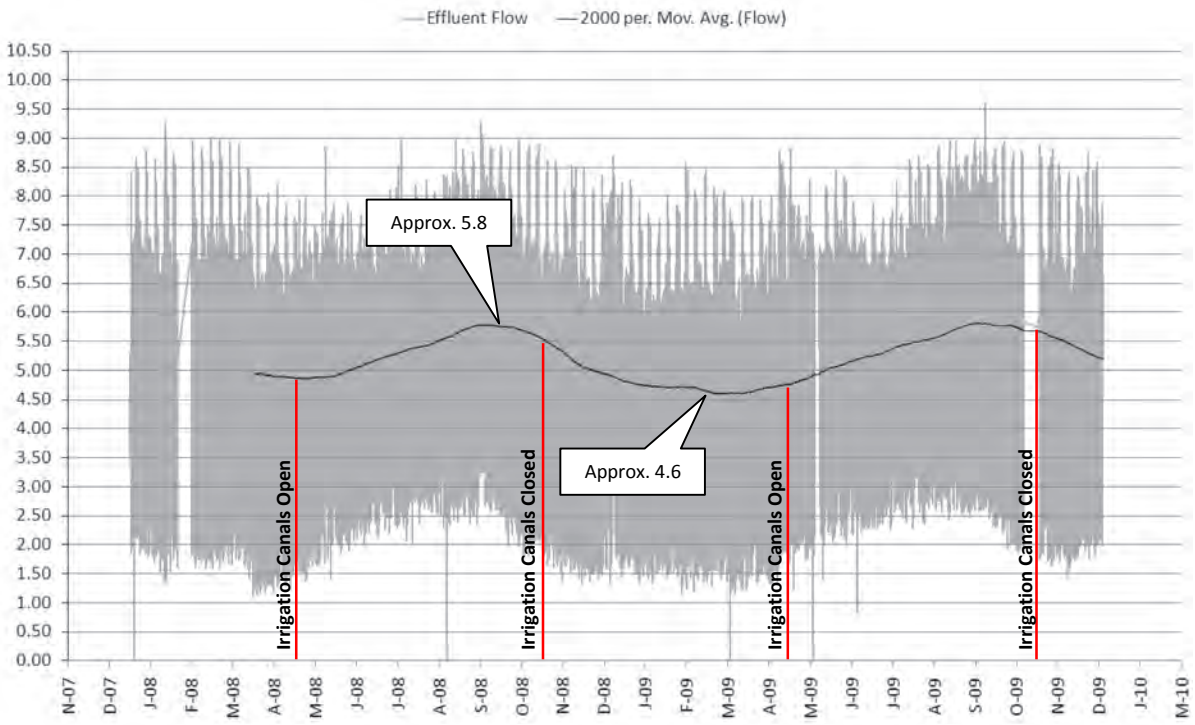

Figure 1. WWTP Effluent Flows: Seasonal Trends

in Semi-Arid Climates

Figure 1 shows the WWTP effluent from January 2008 to December 2009 in an Idaho utility. An analysis of this data shows that flows begin to increase in mid-April in response to the beginning of irrigation season, peak in late September to early October, begin to decrease in response to the end of irrigation season (October 15th), and then level out in December. This data also shows that the plant experiences an increase of about 1 to 1.2 MGD between April and September (a 22% to 26% increase in total plant flow). This increase is attributed to the effects of infiltration throughout the wastewater collection system.

Flow Monitoring In the System

If done properly, flow monitors in the system can then be used to isolate the infiltration and inflow effects to localized areas. In order to quantify the infiltration effects, the monitors should be installed prior to the end of the irrigation season and then continued until flow stabilizes. Figure 2 illustrates how the magnitude of infiltration response was estimated in one collection system subbasin by analyzing the decline in flow from late September to the end of November. Based on these findings, this subbasin accounts for almost half of the utility's annual infiltration flow.

The magnitude of inflow responses in the system are approximated by determining the base flow for each day of the week and comparing that base flow to the actual flow during the time of a recorded storm event. Figure 3 depicts the flow monitoring along the same subbasin as previously discussed. As can be seen, in addition to infiltration, storm events in this area can significantly increase sewer flows (as much as 85%) as well.

Conclusion

While the negative impacts of I/I on collection systems in non-arid regions can be a much more significant problem, the same impacts in arid and semi-arid climates should not be ignored. The data needed to perform a general assessment of the magnitude of the problem in a given utility is typically available at the WWTP. With the magnitude of the problem estimated, a well planned collection system flow monitoring program can be developed to efficiently identify and isolate ways of gaining hydraulic capacity in a system.

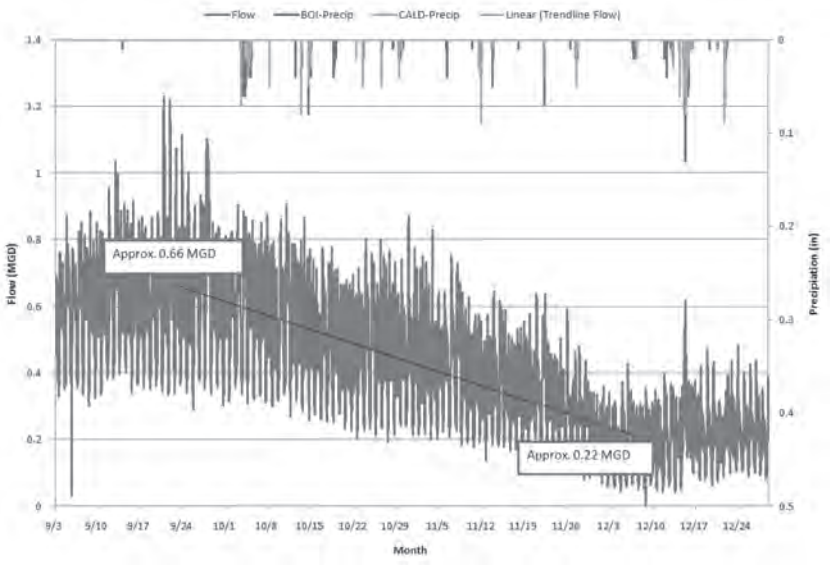

Figure 2. Infiltration Response in Collection System Flow Monitor.

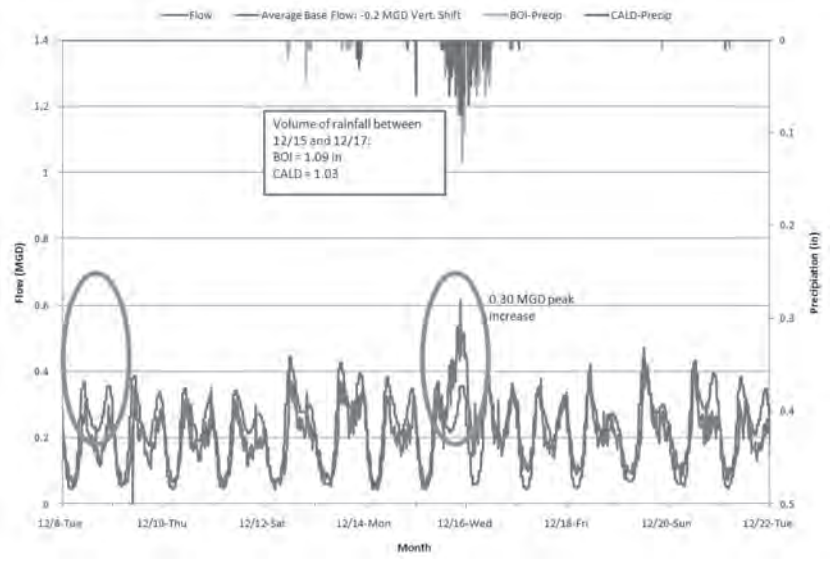

Figure 3. Inflow Response in Collection System Flow Monitor

Risk Based Assessment: A Solution for Prioritizing Scarce O&M and CIP Funds

Jane McLamarrah, PhD, PE, Vice President, MWH

Background

For several years the United States Environmental Protection Agency (EPA) has been emphasizing combined sewer overflow (CSO) and sanitary sewer overflow (SSO) control. These efforts have included a number of changes to enhance the performance of sewer collection systems with the intent of reducing, or preferably eliminating, CSOs and SSOs and of preserving the substantial investment in infrastructure that collection systems represent.

During SSO and Peak Flow Listening Sessions and a webcast in June and July 2010, the EPA solicited comments on reintroducing the January 4, 2001, SSO Rule, that had been withdrawn prior to its publication in the Federal Register. Through such possible future NPDES permit revisions and various enforcement actions against both large and small wastewater utilities, EPA encourages wastewater utilities to invest more operation and maintenance (O&M) and capital improvement program (CIP) dollars in the repair, rehabilitation, replacement and expansion of sewer collection system facilities. In general, and especially under enforcement actions, the EPA is not overly concerned with the ability of wastewater utilities to adequately fund these additional O&M and CIP expenditures.

Utilities on the other hand are faced not only with the need for significant investment in maintaining sustainable water and wastewater infrastructure facilities that are continuing to age and deteriorate, but with declining revenues associated with such things as water conservation, declining industrial usage and loss of customers to home foreclosures and high unemployment within their service areas. The need to effectively prioritize multiple projects competing for scarce budget funds has seldom been greater.

One innovative solution to assess, and thus prioritize, multiple projects in a manner that is both quantitative and understandable to non-technical governing board members and customers utilizes a risk based assessment methodology. The goal of such risk based methodologies is to identify those areas of the system that will have the most impact if a failure occurs and focus asset management resources to minimize the risk.

Risk Based Assessment

MWH has applied simplified, risk based assessments for both pipeline (sewer and force main) and discrete assets (diversion structures, siphons, lift stations and treatment plants) for both small and large utilities across the country. The risk based assessment methodology was based on a quantitative measure of risk that calculated a risk rating for each asset as the multiplication product of a consequence of failure score (a measure of the asset criticality) and a structural condition score (a measure of the probability of structural failure).

For pipeline renewal risk ratings, the consequence of failure scores represented the impact of a structural failure, and were derived on either a 3-point or a 5-point scale, depending on the utility's needs. While this analysis has the potential to be extremely complex due to the challenges of quantifying these types of impacts, the simplified five-category scoring system, or the even more simplified three-category scoring system, was used to assign relative valuations of one asset versus another. This type of simplified impact assessment was deemed more important for purposes of prioritizing efforts than absolute estimates of consequence of failure on systems using 50, 100 or larger point scales.

The types of failure impact considered in the consequence of failure scoring system can, and should, be customized to each utility. Customers within one utility may be more concerned about the costs associated with responding to and correcting failures. Customers within another utility may be more concerned about potential environmental or public health impacts associated with overflowing sewage. *Table 1* summarizes example consequence of failure scoring definitions for a range of factors.

The second component in developing renewal risk rates is the assignment of structural condition scores that represent the probability of structural asset failure. Condition scoring also has the potential to be extremely complex if the actual probability of failure must be assigned. However, as with the consequence of failure scoring system, a simplified condition scoring system can be applied effectively. Many utilities are already using the National Association of Sewer Service Companies (NASSCO) standardized defect scoring systems for pipelines, the Pipeline Assessment and Certification Program (PACP) that uses a 5-point condition scoring scale. ***Table 2*** summarizes condition scoring definitions based on PACP coding.

When actual, field condition data exists, utilities should assign structural condition scores based on the actual data. If actual, field condition data does not yet exist, initial estimates of structural condition can be made based on coarse factors such as the age and material of the pipeline.

Pipeline Asset Risk Example Results

Once the consequence of failure score and the structural condition score were

defined for each asset, a risk rating can be calculated as the multiplication product of the two scores and shown in a risk matrix such as the Dallas example shown in Figure 1. Figure 1 was developed from an analysis of nearly 100,000 gravity pipeline segments in the City's GIS. The renewal risk ratings were defined as either high (shown in red), medium (shown in yellow) and low (shown in green). As with the consequence of failure scores and the condition scores, the definitions of high, medium and low risk cells in the matrix can be customized to each individual utility's needs. (Utilities that want to use a more complex, 5-point criticality score may want to similarly expand the risk categories to a 5-category scale.) Indeed, one of the concerns in establishing the Low Impact, Very Poor Condition cell as a medium risk rating was the potential regulatory agency pressure to make that cell a high risk rating given the EPA's tendency to have a "zero tolerance" for SSOs. However, since this effort was being completed as a part of a proactive master planning project rather than a consent decree-driven program and the City has a low benchmark measure of SSOs per 100 miles of sewer, Dallas was comfortable with the risk assignments shown in Figure 1.

In Dallas, capacity improvement projects were also subjected to a risk based approach to prioritize and schedule the recommended improvements. This risk based approach was based on the same methodology used for the renewal projects except that the structural condition score was replaced with a capacity condition score that represented the probability of overflow as defined by an InfoWorks™ hydraulic model of the Dallas collection system. Capacity condition scores were only defined for the modeled pipe network.

The renewal risk rating results were applied to prioritize pipelines for condition assessment projects if the condition score was based on coarse, age and material scoring or to prioritize pipelines for rehabilitation or renewal if the condition score was based on actual, field condition data.

(continued on next page)

Table 1. Renewal consequences of Failure Scoring Legend.

Consequence of Failure Score	Gravity Pipeline Structural Consequence of Failure Scoring Definition
Very High Impact = E	The impact of failure potentially costs a great deal to repair under emergency situations such as for tunnels, excessively deep pipelines, single barrel siphons or pipelines that cannot be repaired by in-house forces. The impact of failure potentially disrupts wastewater discharge from significant, high volume dischargers such as large industries, commercial developments or apartment complexes. The impact of failure potentially disrupts widely used transportation corridors such as major highways or railroads. The impact of failure potentially threatens environmentally sensitive areas such as drinking water sources, wetlands or coastal areas.
High Impact = D	The impact of failure potentially costs more than average to repair such as odd-sized pipelines requiring special-order pipe sizes, deep pipelines requiring specialized equipment or material or requires extensive flow bypassing. The impact of failure potentially disrupts critical customers such as other public utilities or satellite sewer systems transporting flow to a regional treatment plant. The impact of failure potentially threatens environmentally sensitive areas such as rivers and streams. The impact of failure potentially threatens public health in areas where the public congregates such as parks, schools and hospitals.
Medium Impact = C	The cost of an emergency repair is only slightly more than a repair during normal working hours. The potential impact of failure to significant or critical customers is more of an inconvenience than a disruption of service. There is little potential for impact of failure to environmentally sensitive areas. The impact of failure potentially threatens areas where children are likely to play unsupervised such as in backyard easements or remote park locations.
Low Impact = B	The repair can be delayed until normal working hours resume. Any potential impact to significant or critical customers can be mitigated by diverting discharge to another sewer segment. There is minimal impact of failure to environmentally sensitive areas or to public health that can be mitigated with warning signs or notices.
No Impact = A	The repair can be immediately accomplished with in-house resources and no special equipment. There is no impact of failure to significant or critical customers. There is no known impact of failure to environmentally sensitive areas or to public health such as sewers in undeveloped areas with no nearby sensitive environmental areas.

(continued from page 23)

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MWH and Dallas Water Utilities, Comprehensive Wastewater Collection System Assessment, Collection System Master Plan, October 22, 2007.

Table 2. Structural Condition Scoring Legend

Structural Condition Score	Gravity Pipeline and Discrete Asset Structural Condition Scoring Definition
Very Good = 1	Sound physical condition. Asset likely to perform adequately without major work for 25 years or more for structures and for 10 years or more for mechanical or electrical assets.
Good = 2	Acceptable physical condition. Minimal short-term failure risk, but potential for deterioration in medium- to long-term (10 years plus for structures and 5 to 10 years for mechanical and electrical assets). Only minor work required, if any.
Fair = 3	Significant deterioration evident for structures and deterioration beginning to be reflected in performance and higher attendance for maintenance for mechanical and electrical assets. Failure unlikely within next two years, but further deterioration likely and major replacement likely within 10 years for structures and within five years for mechanical and electrical assets. Minor components or isolated sections of the asset need replacement or repair now, but asset still functions safely at adequate level of service. Work required, but asset is still serviceable.
Poor = 4	Failure likely in short-term. Likely need to replace most, or all, of asset within two years. No immediate risk to health or safety, but work required within two years to ensure asset remains safe. Substantial work required in short-term, asset barely serviceable.
Very Poor = 5	Failed or near failure. Immediate need to replace most, or all, of asset. Component effective life exceeded and excessive maintenance costs incurred. A high risk of breakdown with serious impact on performance. Health and safety hazards exist which present a possible risk to public safety, or asset cannot be serviced/operated without risk to personnel. Major work or replacement required urgently.

Source: Adapted from International Infrastructure Management Manual, Version 3.0, 2006.

Figure 1. Dallas Renewal Risk Matrix

Risk Rating = Condition x Consequence		Renewal Condition Score (probability of failure)				
		Very Good	Good	Fair	Poor	Very Poor
Consequence of Failure Score (criticality)	Low Impact	9 miles (0.2%)	711 miles (17.9%)	1,219 miles (30.7%)	746 miles (18.8%)	52 miles (1.3%)
	Medium Impact	3 miles (0.1%)	161 miles (4.1%)	224 miles 5.6%)	98 miles (2.5%)	5 miles (0.1%)
	High Impact	2 miles (0.1%)	181 mile (4.6%)s	404 mile (10.2%)s	152 mile (3.8%)s	5 miles (0.1%)

Low Risk = 71.8% Medium Risk = 24.1% High Risk = 4.1%

King County Models Efficient, Effective Operations

By Bob Swarner, Collection Systems Committee

Computer modeling of a wastewater collection system can help operation and maintenance staff work more efficiently and, thus, can improve the effectiveness of the agency as a whole. Models, when calibrated to reliable and adequate flow data, serve as powerful tools for assessing the hydrologic and hydraulic response of a sewer system to large storm events and for estimating pipeline capacity. Field staff in King County's Wastewater Treatment Division are using modeling results to identify where overflows are most likely to occur and where sensors are not working properly.

Identifying Potential Overflow Locations

Hydraulic profiles generated from King County models indicate the first manhole in a pipeline that is likely to overflow when there is not enough capacity (Figure 1 below). From such a profile, a GIS map is developed that shows which manholes along the pipeline are likely to be the first to discharge wastewater in a major storm event (Figure 2). Field crews check these locations during or after large

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Figure 2. First manholes to check when suspecting an overflow

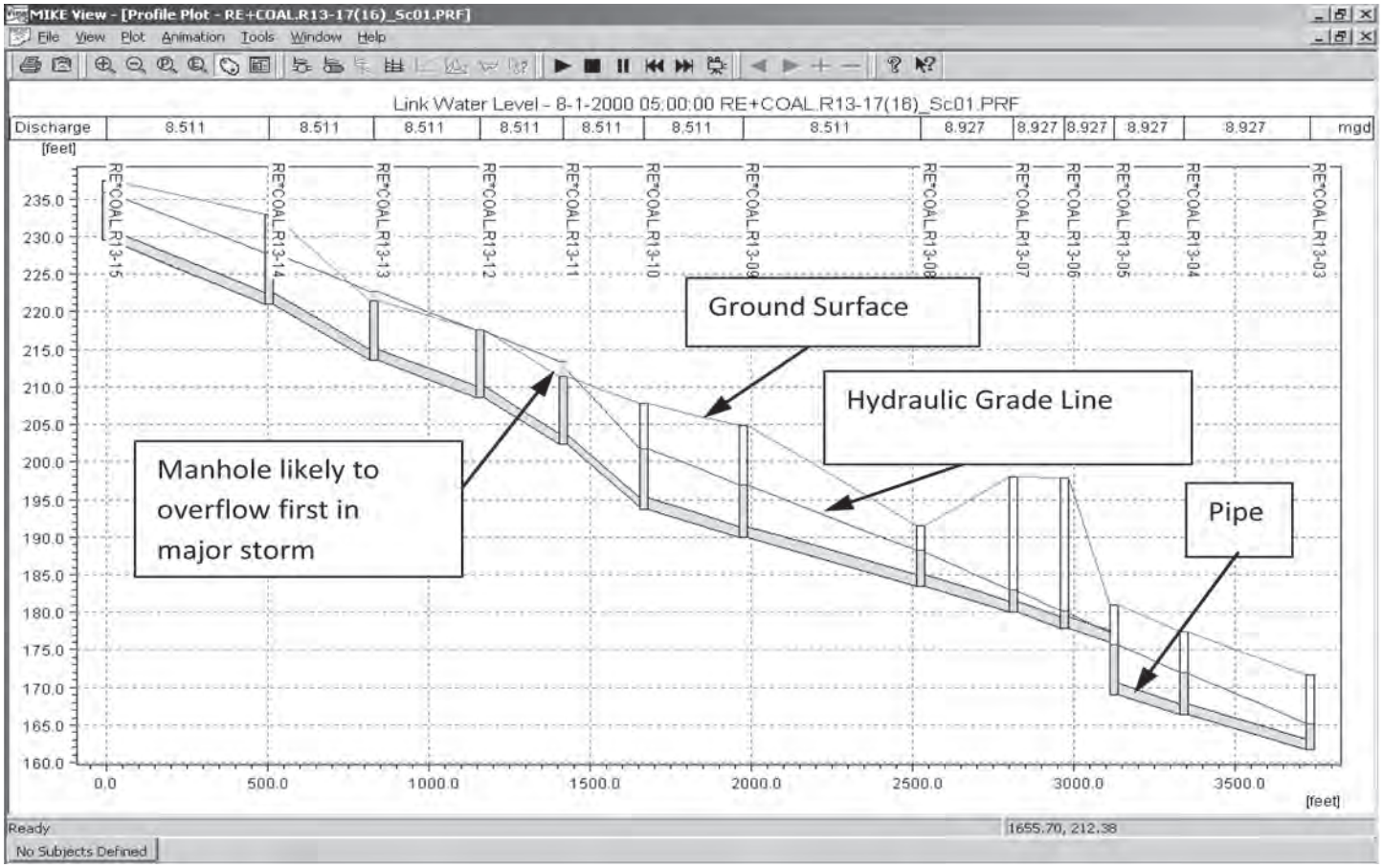

Figure 1. Hydraulic profile indicating the first place likely to overflow during a peak flow event

Thank you for all 2010 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 are due to the following organizations for these kinds of support in 2010. And although not listed here, all PNCWA 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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Section NEWS

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

Puget Sound Section

The first Quarter meeting will be March 1 at Sumner City Hall. Watch the PNCWA website for details and agenda. Claudia Hayden is Secretary - Treasurer and Chris McCalib, Lakehaven Utility District has been elected Vice President. The Section has openings for Directors and Webmaster. If you are interested in serving, please contact Jim Pitts at jim.pitts@kingcounty.gov. The Section is growing and looking forward to continued success in 2011.

KING COUNTY MODELS *Continued from page 25*

storm events to determine if overflows have occurred and if a cleanup is warranted. Knowing in advance which manholes to check saves much time and effort.

Identifying Malfunctioning Sensors

Another way that modeling has benefited King County operation and maintenance staff is in finding malfunctioning sensors. The process of calibrating a hydrologic model involves careful assessment of flow and level data. When data does not "look" right to the modelers, they try to determine the reason. For example, during a large storm event, flow data from a level sensor rose and then leveled off for several hours with no recorded overflow. The sensor leveled off below the overflow weir elevation, even though downstream regulator and outfall gates were closed. The modeler concluded that either the level sensor was likely reading low or the outfall gate position indicator was not working. A properly functioning level sensor, in this situation, would have indicated that the water level had risen above the weir elevation before leveling out. The modeler informed maintenance personnel, and a crew was mobilized to check the gate indicator and repair and calibrate the sensor. Accurate level sensors serve a number of purposes, including allowing the proper operation of a facility and providing information to estimate overflow volumes for regulatory reporting.

Bob can be contacted at Bob.Swarner@kingcounty.gov

Welcome to new members of PNCWA!

The people listed below have become members of PNCWA from mid-August through mid-November. 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. Please let us know how we can best serve your needs and interests and how you would like to be involved.

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Charles Adams, Oak Lodge Sanitary District
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Larry West, Shannon & Wilson
Gordon Woodward, City of Wilsonville
Clark Worth, Barney & Worth
John Yarnall, Westech Engineering
Michael Zeltner, HDR Engineering

FROM THE PRESIDENT *Continued from page 5*

2. Encouraging community sustainability – EPA is currently working with three state CWSRF programs in establishing and incorporating sustainability principles to be incorporated into future funding guidance documents. These principles are intended to mirror similar principles already adopted by the Department of Housing and Urban Development (HUD) and the Department of Transportation. Results of the pilot study will be shared with each state upon completion.

3. Promoting sustainable water and wastewater systems – EPA and State Revolving Fund (SRF) programs are committed to the promotion of sustainable infrastructures through the use of the "Ten Attributes" as identified by the Effective Utility Management Steering Committee in their final report, Findings and Recommendations for a Water Utility Sector Management Strategy.

4. Targeting SFR assistance – SRF programs will remain primarily as loan programs. EPA recognizes that subsidies in the form of principle forgiveness and negative interest rates should be available to promote sustainable systems and to assist disadvantaged communities.

When the 2011 budget passes, those who served on and contributed to the Effective Utility Management Steering Committee should feel a great sense of accomplishment. Your efforts have not only been leveraged to help secure addition funding allocations, but have established guiding principles and tools to manage our utilities more effectively.

The EPA's Clean Water and Drinking Water Infrastructure Sustainability Policy is the result of WEF and PNCWA members' willingness to be engaged. WEF and PNCWA provide numerous opportunities for professional development and leadership roles. Whether you are interested in policy decision making or wish to contribute your technical expertise, WEF and PNCWA has an outlet for you. With more than 50 committees combined, ranging from Academic to Watershed Management, there is a place for you to positively influence our industry.

And Welcome…

to the new incoming PNCWA Board Members:

- Mark Poling, Clean Water Services—Vice President
- Steve Miles, Winston Green WWTF—Oregon Regional Director

PNCWA 2011

Building Professional Excellence in Water Quality™

Annual Conference & Exhibition
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Call for abstracts for the 2011 Pacific Northwest Clean Water Association Annual Conference IS NOW OPEN.

CALL FOR ABSTRACTS

Abstracts must be submitted online at http://www.pncwa.org/abstracts

Abstract submission closes March 4, 2011

The PNCWA2011 conference in Vancouver, WA is scheduled for **September 18–21** at the Hilton Vancouver Hotel & Convention Center. More than 700 individuals are expected to attend. The annual conference, now in its 78th year, provides critical training and networking opportunities to ensure that environmental professionals have the tools needed for maintaining service, safety and public health. A letter for budget decision makers summarizing the importance of training in this current economic climate is available on the PNCWA website at http://www.pncwa.org/training-budget.

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. In addition to the Program topics, the technical program committee hopes to include a session in the conference program that will focus on the broad range of challenges and solutions encountered in the various regions of our association and encourages submission of abstracts to populate this "Challenges and Solutions" session.

Program topics include:

- **Sustainability:** water reclamation/reuse, sustainable development, natural treatment systems, onsite and decentralized treatment, sustainable water resources, energy recovery, integrated water resources management
- **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
- **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
- **Industrial treatment/pretreatment:** regulatory issues, pretreatment programs, controlling FOG
- **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 including, but not limited to, "leading edge" university research, WERF research, or project-related pilot studies or research. This topic is intended to provide research information on the "front end" of a relevant wastewater-related topic, such as phosphorus removal, microconstituents, hyporheic discharge for temperature mitigation, etc.

Abstracts must be submitted online prior to March 4, 2011 at http://www.pncwa.org/abstracts

Please limit abstracts to approximately 300 words and include a one-page 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 Vancouver and hope that you can be a part of it. We look forward to seeing you at the conference in September.

Court Harris, P.E, PMP
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Technical Program Chair

If you need any assistance or have any special circumstances, please contact myself Court.Harris@ch2m.com or Michael Rainey, PNCWA Staff mikerainey@pncwa.org

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W3QLAS Aquatic Microscopy Workshop

Port Angeles, Washington on March 23-25, 2011.

Class hours will be from 8 am to 5 pm Wednesday through Friday.

Dirctions will be mailed to each applicant.

Sponsored by: West Washington Water Quality Lab Analyst Section (W3QLAS) of PNCWA and Peninsula College.

Instructors: Victor Santa Cruz, Biologist, Inland Empire Utilities Agency.

Purpose: Designed for water or wastewater technicians, laboratory, operators, and pretreatment professionals.. The class will demonstrate essential functions of the light, phase contrast, and epifluorescent microscopes; identification of protozoa, bacteria, and non-living items found in wastewater; and methods for ensuring optimal functioning of a wastewater system based upon microscopic findings. An introduction to FISH (Fluorescent in-situ Hybridization) theory and practice. Prerequisite: One year in a water or waste water laboratory or instructor's permission.

Opportunities: Upon satisfactory completion of the Process Control Workshop each student will receive 1.5 credit hour (this equates to 2.4 CEU's). Participants must fill out a student enrollment form that will be handed out at the beginning of the class. Students are encouraged to bring their phase contrast microscopes and samples.

$450 - WEF / PNCWA Members $605 - Non-Member $365 - Student Rate

Call (360) 417-4845 for additional information

Adopt-a-School Program

During its sophomore year, the 2009-2010 Adopt-a-School grant program supported water education curriculum and projects in 6th-12th grade classrooms throughout Oregon, Washington and Idaho. In addition to their funded project work, recipients were required to visit their local wastewater treatment facility for a tour and/or have a water industry professional present to their class. Here are excerpts from reports by some of the recipients.

Mary Sue Scheller, Fowler Middle School

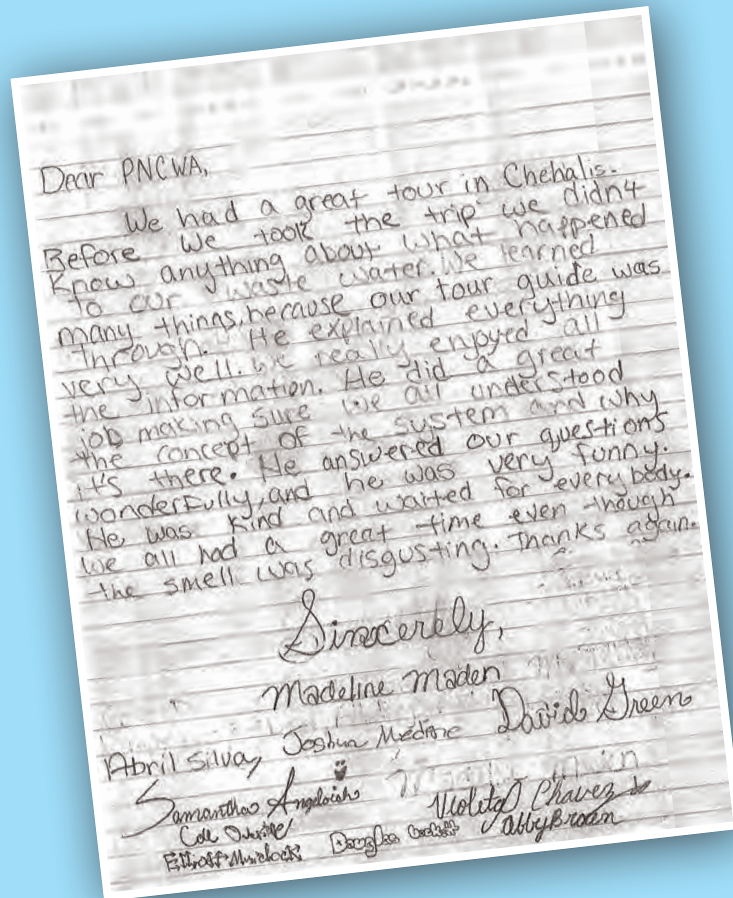
Three different classes tested Summer Creek behind the school for temperature, pH levels, dissolved oxygen, and turbidity. The data was sent to scientists at the University of Arizona who work with the Globe Program, a project that involves students all around the world. We participated in World Water Day, and we made the Chief Scientist's Honor Roll for Hydrology. Thank you for making this possible.

Tammy Schrader, Rachel Carson Environmental Middle School

We planted over 1800 native plants at our SOLV site this year as well as coffee bag, cage, and mulch them.

Kimberly Crowell, Cleveland High School

This year my students investigated the question, "How does the water quality of Johnson Creek change from the headwaters near Boring, OR to its confluence with the Willamette River?"



Dear PNCWA,

We had a great tour in Chehalis. Before we took the trip we didn't know anything about what happened to our waste water. We learned many things, because our tour guide was through. He explained everything very well. We really enjoyed all the information. He did a great job making sure we all understood the concept of the system and why it's there. He answered our questions wonderfully, and he was very funny. He was kind and waited for everybody. We all had a great time even though the smell was disgusting. Thanks again.

Sincerely,

Madeline Maden

Abril Silva, David Green

Violeta Chavez

Jessica Levine, Eckstein Middle School

The grant monies were applied to our annual Clean Water Challenge curriculum.

Student of Rebecca Morris, La Center High School

We took a field trip to La Center's Waste Water Treatment Plant and learned about how water treatment centers are important to every city.

Lisa DeMontigny, Raymond Elementary School

I would like to thank PNCWA on behalf of the Raymond 6th grade students and teachers. We had an awesome field trip to the Wastewater Treatment Plant and Poplar Tree Farm in Chehalis, Washington.

W3QLAS Activated Sludge Process Control Workshop

Peninsula College in Port Angeles, Washington on March 21-22, 2011.
Class hours will be from 8 am to 5 pm Monday through Tuesday.

Sponsored by: West Washington Water Quality Lab Analyst Section (W3QLAS) of PNCWA and Peninsula College.

Instructors: Chuck Zickafoose and Woodie Muirhead of Brown and Caldwell.

Purpose: To provide wastewater treatment process control through classroom instruction and hands-on experience with the principles of activated sludge process, process control techniques, monitoring equipment, and troubleshooting of the wastewater treatment process, biological nutrient removal, and selectors. Students will become proficient in interpreting lab results, troubleshooting the treatment process, predicting plant loading and the effects of changing WAS and RAS rates, identifying the role of microorganisms in the treatment process, and more.

Opportunities: Upon satisfactory completion of the Process Control Workshop each student will receive 1 credit hour (this equates to 1.6 CEU's) from Peninsula College. Participants must fill out a student enrollment form that will be handed out at the beginning of the class. Students are encouraged to bring or ship samples of their activated sludge to the Port Angeles WWTP, 1509 East Columbia Street, Port Angeles, WA 98362 (insure they are kept cool).

$300 - WEF / PNCWA Members $400 - Non-Member $200 - Student Rate

Call (360) 417-4845

Pacific Northwest
Clean Water Association
P.O. Box 1075
Caldwell, ID 83606