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Hello AZWater!

It is my sincere honor to serve the Association as your President for the coming year. I am so proud to be a part of the membership of AZ Water and what the Association stands for...Professionals Dedicated to Arizona's Water. I thank my bosses, my mentors, my colleagues, and my family for supporting me and encouraging me to "get involved" in the industry, volunteer for a committee, serve on the board...and now to fulfill my commitment to lead this fine organization after years of service, as your President...Even if it means conference calls from airports and becoming an "A-list" flyer on Southwest Airlines!

Yes, although I have splurged on the red cowboy boots, and I am starting to say "y'all" and "all y'all" at meetings thanks to my new Texas address (and note the new cell number), my home and my heart is still in Arizona...and how I miss that blazing sunshine and crystal clear blue sky some days! I know I am not alone, as several of my fellow board members and colleagues have become road warriors themselves...going to work wherever needed around the country. In April I ran into Jim Curcio at Texas Water in Galveston, and just last week I bumped into John Bannen in the Houston airport. Funny how he was "going to New Orleans" and I was "just returning"! I was so surprised I didn't see Kevin and Dana Conway in the Newark airport last month! This criss-crossing of lives and professionals across the country is becoming common place as I am certain each and every one of you knows someone who has "relocated" for work, or who is "covering more territory" or "traveling for a project", particularly for those in consulting and construction. So, is this "the new normal"? Maybe so...at least for right now.

With Arizona's growth in a holding pattern the past few years due to the tight economy, our profession was hit hard with cancelled or delayed projects and we have seemingly gone into more of a "maintenance" mode compared to years prior when City CIPs were more robust. So, many professionals have taken to the skies seeking opportunities to share expertise where it is most needed (and, of course, staying employed). What is fascinating is that it seems that other places "really do need us", and need our ideas.

So, what does this mean for Arizona? Are we losing people and talent from our industry? Or...maybe we are just "lending them out" for a while? I see this trend as an opportunity for us to influence others...to bring Arizona's forward thinking ideas to new cities and towns in other states so they, too, can someday view "water as water", a precious resource to be conserved and reused, as opposed to the more common water/wastewater division that is still prominent across the nation. At an industry lunch just last week in the Houston area topics discussed were "drought", "water resources" and "developing surface water supplies" due to a legislative mandate to reduce groundwater use. I thought, didn't we (Arizona) already do that? Well, yes WE DID!...Thanks to the 1980 Arizona Groundwater Management Code, hallmark legislation that fueled the need for Arizona to develop renewable water supplies to serve its growing population and development needs. Been there, done that! And, the facilities and systems you all planned, engineered, constructed, operated and managed over the past 30 years as a result of this initiative are some of the most modern and cutting edge in the nation. We employed some of the most advanced technologies, instrumentation, water quality standards, and project delivery methods in the industry. And, now we have the opportunity to share that expertise with others. We should be PROUD of our leadership in the water industry.

I am PROUD to be from Arizona...I am PROUD to have had the opportunity to work on so many cutting edge treatment facilities and projects with so many of you. I am PROUD of the planners, engineers, builders, operators, and managers who did such an exemplary job getting us to where we are today...one of the most technology rich, well-planned, forward-thinking water industries in the nation. Be PROUD of yourselves, AZ Water Professionals! And, for those who are hitting the skies...I know y'all will be back...it's just a matter of time.

Wherever I travel, wherever I work, I am a PROUD ambassador of our Arizona water industry.

Proudly representing you,
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Thank you for electing me as your next AWWA Director. I have enjoyed the past four years serving as the AZ Water Treasurer and I’m looking forward to this new role as Director. I want to thank Frank Tantone for his service, leadership, and dedication over the past three years that he served as your AWWA Director. I know he has left me big shoes to fill and I’m looking forward to the challenge.

If you were able to attend the AZ Water Conference in May, you probably saw that two of our AZ Water leaders were honored with prestigious AWWA awards. Andy Richardson was the recipient of the Outstanding Service Award, which demonstrates outstanding service to the Association through leadership and active participation in AWWA programs. Karl Kohloff was inducted into the Hall of Fame, which honors those who have made the most significant contributions to the field of public water supply. I have had the pleasure of working with both of these great leaders in our industry. Please join me in congratulating them on achieving these great honors and thanking them for the contributions to both AWWA and the water industry.

I was able to attend the summer AWWA board meeting at ACE in early June and I can tell you there are great things happening within AWWA. At the board meeting an updated Strategic Plan was adopted. This includes several core principles: Protect Public Health, Safeguard the Environment, Pursue Excellence, Act with Integrity, Provide Value, and Foster Diversity and Inclusion. I see these core principles as “guiding lights” for AWWA. They define our values and point AWWA in a direction that all AWWA members are striving to achieve each day. The strategic plan also includes four strategic goals: Member Engagement & Development, Organizational Stewardship, Knowledge Creation and Exchange, and Water Policy. Within each of these goals are various objectives. The goals and objectives define the path going forward over the next 2-5 years. There was a lot of discussion among the Board about the goals and objectives that mostly centered on total water management. AWWA has a strong history of being the drinking water association and many members want to continue that tradition. However, as we all know in Arizona, all water, whether it is surface water, reclaimed water, or storm water, is needed to sustain communities. All water is connected and used for the betterment of society and the environment. Therefore, AWWA has begun to embrace the idea of total water management. This updated strategic plan combines the history of being the drinking water authority with the development of total water solutions. This really is an exciting time to be an AWWA member.
Make your 2013 WEBINAR resolution

**Mitigation of Hazards, Disasters and System Failures Bundle**
- Colorado Wildfires Along the Front Range - Emergency Preparedness and Lessons Learned  
  January 23
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  March 6
- Cross Connection Control and Hazard Assessment  
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**Regulatory Bundle**
- What Revisions to TCR Will Mean for Water Systems  
  January 30
- Electronic Consumer Confidence Reports - What You Need to Know  
  February 20
- Regulatory Update  
  December 12
- Two more included: topics to be determined

**Water Treatment and Operations Bundle**
- Maximize Your Hydraulic Model: Improve Water Quality and Water System Functionality  
  February 6
- Continual Quality Improvement in the Laboratory  
  April 3
- New Developments in Sodium Hypochlorite On-Site Generation Technology  
  October 23
- Finding Hidden Dollars in your O&M Budget  
  November 6

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  September 11
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AZ Water Association News

2013-2014 AZ Water Board of Directors

L-R Front Row: Lisa Jackson, Brandy Kelso, Bob Hollander, Teresa Smith-DeHesus

L-R Back Row: Alan Forrest, Dave Redman, Tom Galaziewski, Don Manthe, Chris Hill, Jeanne Jensen, Mark Martinez, Lisa Culbert, Asia Philbin (not shown Patty Kennedy & Jacqueline Shaw)

Board Recognition Awards

Board President, Chris Hill (center) congratulates and thanks the following Board Members for their leadership and service to the AZ Water Association, Arizona Section of the American Water Works Association, and Arizona Water Environment Association - Frank Tantone, AWWA Director; John Bannen, Board Member; Chuck Graf, Board Member; and, Brandy Kelso, Treasurer.

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Don MANTHE WEF Delegate

Wow! What an outstanding conference last month! Thanks to all the people involved to make it a success – what a great volunteer organization we have in AZ Water! However, I wanted to tell you about something that involved AZ Water before our conference. WEF and AWWA held their third joint Water Matters Congressional Fly-In on April 17-18 in Washington, DC. The Fly-In provided an opportunity for water professionals to carry a united message about the value of water and benefits of water investment directly to their elected officials. Philip Saletta of Oro Valley and I were the Arizona delegation for the fly-in and in a hectic two days, met with staff of all the Arizona Congressional Delegation. Thanks to Philip for his organization and leadership on our trip!

Our task was to lobby and educate the Arizona members of Congress on a pilot program called the "Water Infrastructure Finance and Innovation Act (TIFIA)" or WIFIA. Most of the following is derived from the talking points we used and an excellent article by Dan Hartnett of the Association of Metropolitan Water Agencies (AMWA). So settle back and read about one of the most important financial and economic proposals for our water/wastewater industry in years.

Most Americans think of decaying bridges and roads when they think of the nation’s aging infrastructure. However the large network of underground pipes and hidden-away treatment facilities of water and wastewater infrastructure is largely forgotten. Water main breaks alone cause communities to waste over two trillion gallons of drinking water a year at a cost of $2.6 billion. EPA estimates that water and wastewater systems together will need nearly $633 billion over the next 20 years just to maintain current levels of service – not counting new infrastructure to account for growth and expansion.

Spurred by these figures and the need to think creatively in today’s new era of tighter budgets and politics, a new approach to financing water/wastewater infrastructure is needed – desperately! WIFIA has the potential to offer municipalities low-cost financing options without relying on unsustainable rate and service fee increases. Local water rates and service fees cover typical operating and maintenance costs. However, larger infrastructure projects – water mains, collection systems, and treatment plants – are often financed through local municipal bond sales. These generate the needed capital up front, but cause communities to collectively pay billions of dollars in interest charges over time.

One successful funding source is the State Revolving Fund (SRF) programs funding by Congress and administered by the EPA and individual states and territories. The states then lend out dollars to individual communities to fund eligible projects and these communities then repay the principal and below-market interest back to the state over time. However, this program is limited due to eligibility requirements and the amount of money available. SRF was not intended to address the full scale of infrastructure needs facing our industry today.

The resulting reality is that we currently have no federal program to offer low-cost financing for major water infrastructure projects that do not rectify an imminent public health threat – the very types of projects that are essential to protect and modernize the country’s water and wastewater infrastructure.

This is where WIFIA comes in. Based on the successful Transportation Infrastructure Finance and Innovation Act (TIFIA) that has helped communities across the country finance large-scale transportation projects, WIFIA could offer direct low-cost financing for a broad range of construction, replacement, rehabilitation, and security improvements in drinking water and wastewater systems. To keep the program’s focus on projects that are too large for meaningful SRF assistance, a minimum loan amount (say $20 million) could be established as a baseline for WIFIA eligibility.

To maximize savings opportunities for communities and their rate payers, WIFIA would allow the EPA to offer project loans at long-term U.S. Treasury rates – which beats the interest rates available to communities on the municipal bond market. The WIFIA loan recipients would pay back all funds plus interest to the Treasury over several decades, thereby replenishing federal coffers with a steady stream of revenue. From a federal budgeting perspective, WIFIA loans represent a low-risk investment of taxpayer dollars. The AWWA reports that Fitch Ratings calculated the default rates on water bonds issued between 1979 and 1997 to be only 0.04% - making them one of the safest investments anywhere. If WIFIA could duplicate the 10-to-1 leverage ratio of TIFIA – where $1 in subsidy appropriation supports $10 worth of credit assistance – then a small outlay of federal monies can support a substantial number of water infrastructure projects.

Some other related economic benefits? Each dollar of water/wastewater infrastructure investment increases America’s GDP by $6.35 and each new job in the water/wastewater industry creates 3.68 additional jobs in the national economy. Improving our economy and rebuilding our needed public infrastructure sounds like a great low-risk investment to me.

continued on page 72
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As Senior Project Manager, Bob will oversee the Drainage and Flood Control projects and further Dibble’s goals in providing quality, timely and value-priced consulting services. He brings strong leadership and experience managing multiple teams to evaluate engineering quality and performance, and ensure owner satisfaction.

Bob holds a Bachelor of Science in Civil Engineering from Michigan Technological University. He is a registered Civil Engineer, Certified Floodplain Manager, LEED Accredited Professional, and former State Chairman of the Michigan Stormwater-Floodplain Association.

Brian McBride joins AMEC as Water and Wastewater Practice Leader

AMEC, an international engineering and project management company, is pleased to announce that Brian McBride, PE, recently joined the Phoenix office as the Water and Wastewater Practice Leader. Brian was the founder and principal of McBride Engineering Solutions, a leading local water and wastewater engineering firm. A respected industry veteran, Brian has long-term relationships with many stakeholders, agencies and developers in the Phoenix area. He has more than 20 years of specialized experience in water and wastewater facilities design, construction administration, program management, startup and commissioning, arsenic treatment systems, permitting, design-build and construction manager-at-risk projects. His expertise includes detailed design for water and wastewater treatment facilities, reservoirs, pump and lift stations, recharge sites, pipelines and solids handling facilities. Brian also performs engineering studies including treatment facility plans, feasibility, facility and collection master plans, remote valve stations, process alternative analyses, siting, reuse system planning, residuals impacts, influent design parameters, effluent disposal alternatives and biosolids handling alternatives.

McCarthy Southwest’s Infrastructure Services Team Hires Tracy Kimnach as Project Director

McCarthy Southwest, a division of McCarthy Building Companies Inc. (www.mccarthy.com), recently hired Tracy Kimnach as project director within the Infrastructure Services team. Kimnach has more than three decades of experience in the construction industry. Most recently, he served as senior construction manager for the $359 million Lime Softened Water Treatment Plant (WTP-4) in Austin, Texas, where he worked closely with the Carollo Engineers design team during pre-construction and throughout the various construction phases.

Also joining AMEC from McBride Engineering Solutions are Tim LeClair, Debra McGrew and Matthew Andros. Tim LeClair, PE, is an Arizona-registered professional engineer with 14 years of experience providing study, design, permitting and construction services for water reclamation facilities, reclaimed water pump stations and force mains, sewer collection systems, potable water booster pump stations and storage tanks.

Debra McGrew, PE, is a registered civil engineer with 30 years of experience in design and construction administration of water and wastewater infrastructure projects. Her expertise include pumping stations, pipelines, civil/site design, water and wastewater facilities design, odor evaluations and control designs, hydraulic modelling, landfill, drainage systems and permitting and easement acquisition assistance.

Matthew Andros offers 18 years of experience in water and wastewater treatment/facilities design and construction projects. He provides design and construction administration services, startup and commissioning assistance, operability reviews and operations assistance for design-build and construction manager-at-risk projects.

The addition of these key technical professionals to the Phoenix office enhances AMEC’s ability to provide full-service water and wastewater engineering services throughout the region.
“Tracy’s experience with complex, large-scale water treatment plants and his 30-plus years of experience working on CM at Risk, Design Build, Design-Bid-Build and negotiated construction projects will be a positive addition to our team,” said Frank Scopetti, McCarthy senior vice president and leader of the Infrastructure Services team.

In his new position with McCarthy, Kinnach will lead construction of one of the largest ozone treatment facilities servicing a 770 MGD water treatment facility in Wylie, Texas. As project director, his focus will be on leading various internal and external project teams to ensure a successful, fully integrated approach throughout all phases of the project. He will work closely with preconstruction directors and design teams to bring added value during the design phase. Throughout the duration of the project, Kinnach’s role will focus on project management continuity with emphasis on cost, schedule and quality control.

Kimnach previously served as a senior construction manager and lead estimator for Montgomery Watson Harza Constructors based in Austin, Texas. He is an honorably discharged U.S. Navy veteran, and attended the University of Nebraska and Frontier Bible Institute. He holds his Project Management Professional (PMP) certification and has completed numerous OSHA and other agency training courses.

The Water Environment Federation (WEF) proudly announces fifteen distinguished members as 2013 WEF Fellows recipients. This prestigious designation recognizes members’ achievements, stature, and contributions in the water profession. One of our very own in Arizona received this distinguished honor; Bruce Rittmann, Swette Center for Environmental Biotechnology Bodesign Institute at Arizona State University, Tempe, AZ.

“WEF is very pleased to recognize this truly outstanding water quality professional” said WEF Executive Director Jeff Eger. “The 2013 Fellows are among the worlds finest in service to water quality, the environment, and public health.”

The WEF Fellow Recognition Program underscores WEF’s reputation as a valuable water quality resource, which is due in large part to the expertise of its diverse membership. WEF Fellows are recognized in various areas of expertise including, but not limited to design, education, operations, regulation, research, utility management and leadership.

The 2013 Bruce will be recognized during WEFTEC 2013, WEF’s annual technical exhibition and conference to be held in Chicago, Ill., this October 5-9.

TRIVIA QUESTIONS

From the Office of the AZ Water Association Historian

A. Who is often given credit for inventing bifocals?
B. What were the first words (not just sounds) voiced in a cartoon by Mickey Mouse?
C. Location of the first Olympics held (1904) in the United States?
D. When was the Eiffel Tower constructed (in Paris, France)?
E. Date the first “folding” umbrella was introduced?

See answers on page 40

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In the late 1990s, residents in an unincorporated 80-year-old subdivision bordering the northwest corner of the City of Yuma realized they had a serious problem. There were 2,182 dwellings on 322 acres which were discharging wastewater to either septic tanks with leach fields or cesspools. Many of these systems were beginning to fail as a result of age, poor installation, and high ground water. Depth to groundwater is only 12 to 20 feet in the area and these failing systems posed a real threat to the groundwater quality. With the aim of solving the problem, Yuma County assisted area residents in the formation of the Avenue B & C Colonia Improvement District (District), bounded by 1st Street on the north, 8th Street on the south, Avenue B on the east, and Avenue C on the west.

Team Work is the Name of the Game
Throughout the project, from the formation of the District to the completion of construction, the community, Yuma County, the City of Yuma, numerous utility providers, consultants, and contractors worked cooperatively and proactively to make the project a success. It all started in 1999 with the submission of a Letter of Intent to the Border Environment Corporation Commission (BECC). In 2002 members from the community formed a committee that would work towards the establishment of an improvement district. A feasibility study was completed by Hazen Sawyer in 2003. This was followed by a County application for Border Environmental Infrastructure Funding in 2005, at which time an Environmental Assessment was completed by Stantec Consulting Services (Stantec).

Once the district was formed in 2007, the County helped secure a total of $23 million in grants and loans to fund a sewer collection system from a variety of agencies, including the Border Environment Corporation Commission (BECC), North American Development (NAD) Bank, the Environmental Protection Agency (EPA), Water Infrastructure and Finance Authority (WIFA), and the USDA Rural Development. The Preliminary Engineering Report and Design Concept Report were completed by Huitt-Zollars in 2008 and 2009. By the end of 2009, Stantec completed design plans and specifications for the installation of approximately 8.7 miles of main line sewer to tie the subdivision into the City of Yuma’s existing sewer system. As part of the design, Ninyo & Moore and Nicklaus Engineering completed geotechnical services, Saf-r-Dig Utility Surveys carried out poholing, and James Davey and Associates performed on lot investigation for septic tank locations.

Construction began in 2010 with Blucor Contracting as the General Contractor. The majority of work was self-performed but several subconsultants assisted with the construction. Construction oversight was performed by Stantec and James Davey and Associates.

From the beginning, Yuma County has been the driving force behind moving the project forward. Yuma County staff played a pivotal role in every phase of the project, from its initial conception to construction completion. The City of Yuma, as the entity receiving the wastewater, had a keen interest in the work and played an important role throughout the project. The City performed reviews in the design phase and inspection during construction.

The diagram at left shows the overall timeline for the project. Construction was originally scheduled for completion in August of 2011 but a change order to connect all the mobile home parks within the District extended the completion date to March of 2012.

Challenging Construction Conditions
The sewer collection system was installed in very narrow street corridors and required careful review of water, natural gas, electric, drainage, and irrigation utilities in the area. This review of existing utility drawings, above ground features, and a detailed poholing program were used to verify the utility locations.

Pipeline Alignment
The general pipeline routing and Right-of-Way acquisitions for this project were determined during the preliminary design. However, the actual location within the Right-of-Way had not been established and in locations where new easement or right-of-way was not required, modifications to the general alignment were possible. In determining the pipeline alignment and most cost effective project, the design team considered locating new pipelines within existing Rights-of-Way to avoid additional land acquisition costs and the location of other utilities, to minimize land owner impacts, and to maximize the space available to physically construct the pipeline while improving future access for the City to perform maintenance.

Relocation of existing water lines and support of overhead power/telephone poles. The sewer lines were designed with a minimum acceptable but maximum possible clearance from existing utilities. Where there was insufficient space in the roadway, alleyways were utilized for pipeline alignments. Alley construction has an additional advantage, as it allowed the contractor to avoid the installation of temporary driveways, reduced the amount of traffic restrictions and detours for the residents, and most of the tie in locations for the dwellings were located closest to the alley.
the existing power poles was necessary in several locations in order to accommodate construction of the sewer lines.

**Depth of Mains and Number of Lift Stations**

The depth of mains, amount of dewatering and the number of lift stations are interrelated. The number of lift stations included with a design like this one, significantly impacts the depth of the mains. The more lift stations, the shallower the main. Shallower mains require less excavation and minimize dewatering operations, in turn lowering construction costs. However, the more lift stations you have the higher the capital cost for their construction and the higher the operation and maintenance costs to the City.

For this project only one lift station was constructed. The purpose of the lift station was to route sewage overtop of an existing Bureau of Reclamation 66-inch well field drain line that crossed north to south down the center of the project. The lift station only services a small portion of the residents. The remainder of the project consisted of gravity sewer lines. The City of Yuma limited the locations for connection of the subdivision to a 42" Interceptor located on Avenue C. This required deep sewers along the west side of the project and significant dewatering.

The connections to existing manholes were installed above the flowline but not so high that drop manholes would be required. This allowed the contractor to core through the existing manhole, eliminate the need for by-pass pumping, and make the connection more quickly for less cost. Where the connection could not be constructed above the flowline, a new manhole was constructed on the existing line. A new manhole allowed connection without shut-down or by-pass pumping. Constructing a new manhole was much less expensive than by-pass pumping and connection to an existing manhole.

**Restoration Requirements and Impact to Residents**

Construction impacts to residents could not be avoided because the project is located in a densely populated area. The residents were most significantly impacted during the installation of the sewer services through their yards. The project required the contractor to make the service line connection upstream of the existing septic tank or cesspool and to properly abandon the septic tank or cesspool. To minimize potential impacts, each lot was visited during design to determine the location of the existing septic tank, cleanouts and existing features. This information was used to locate the new service line to minimize impact to the resident and the restoration requirements to the project.

The Contractor was also responsible for a video or photo log of the existing site conditions prior to construction so that there were no questions later regarding the quality of restoration. A Right-of-Entry was acquired from each resident before entering their property for construction.

Throughout the project, the County conducted a public awareness program to inform the residents and general public about the project through flyers, signs and public meetings.

**The Future is Healthy**

Now that the project is complete, the community is enjoying a better standard of living. Public health, safety and welfare are significantly improved because of the elimination of septic tanks and cesspools contaminating the ground water and removal of open cesspool hazards. In addition, the sewage is being collected and conveyed to the City of Yuma Wastewater Treatment Facility for proper treatment.
Committee News

WATER FOR PEOPLE
Mark Stratton Receives
Kenneth J. Miller Award

Mark R. Stratton, General Manager of Metropolitan Domestic Water Improvement District and past President of AZ Water, received the Kenneth J. Miller Founders Award at the Water For People Founders Award Luncheon at ACE 2013 in Denver on June 10. The Kenneth J. Miller Award is presented to individuals who have made a significant contribution of time and talent to creating a better world through their involvement with Water For People.

Mark has been consistently making a significant impact in the lives of an untold number of small communities throughout the developing world with his close involvement in the creation of Water Buffalos, the motorcycle group who have acquired national attention amongst water professionals with their motorcycle trips and grand entrance to ACE conferences. Mark also has been instrumental in the success of Pedal with Purpose, which is part of the world-class El Tour de Tucson every November.

He is not a stranger to anyone in the water community and certainly not to AZ Water, having made comparable contributions to every aspect of this organization: as a former AWWA Director, chair of the Water Utility Council, and past President of AZ Water to name a few. Congratulations! Mark on this well-deserved recognition.

Water For People and Layne Christensen Announce Partnership

Water For People and Layne Christensen Company (Layne) are pleased to announce a new strategic partnership in which Layne will provide technical expertise to Water For People to establish best practices, as well as promote employee involvement with Water For People events in or near their work locations.

In a recent Layne press release, Ned Breslin, CEO of Water For People commented, “Our vision for the world is that everyone should have access to long term, reliable sources of clean water. In Layne, we have found a partner who shares our vision.” Layne President and CEO Rene Robichaud said, “Layne is honored to partner with Water For People to help combat the global water crisis. As the leading sustainable solutions provider to the world’s natural resources, we look forward to sharing our 130 years of water management expertise to help Water For People build and develop sustainable drinking water and sanitation solutions for communities around the globe.”

Although the partnership is new, Layne’s Arizona offices have hit the pavement running. According to Jeny Hausladen, Layne’s local Water For People Committee liaison, Layne is familiarizing its employees about Water For People. A workplace giving program has been established where employees can make automatic contributions to Water For People directly from their paychecks. Layne is encouraging employees to join co-workers, like Jeny and long-term Water For People supporter Chuck Ritter, volunteer by participating in the Arizona committee and help promote local Water For People events.

Chuck comments on his experiences – Water For People is “a terrific organization that provides an avenue for water professionals like myself to feel like they’re making a significant contribution towards the betterment of life for those in the developing world. Throughout the course of my involvement on the two Section Committees (Rocky Mountain and Arizona), I’ve gotten to “rub shoulders” with some truly outstanding and committed individuals, and had a lot of fun, not to mention, my fair share of laughs, in the process.” Jeny further reports, “We have seen a lot of excitement and support for Water For People in our local offices and know that will only continue to grow.”

AZ Water’s Water For People Committee is a growing group of committed professionals who want to make a difference. New volunteers are always welcome to the Committee. With every new volunteer, ideas, enthusiasm, and momentum grow exponentially. Contact the committee today!

Event Wrap-ups

2nd Annual Run for World Water. The 2nd Annual Run for World Water at Kiwanis Park on March 16, 2013 was a huge success with approximately 200 runners participating. The event included a 5K Fun Run, 1K Walk, and Kid’s Lollipop Run, followed by breakfast burritos by Chef Chuck Ritter. First Place male winner was Zac Zarling. First place female winner was Laura
Upcoming Arizona Water For People Events

Golf! Golf! Golf! By the time you are reading this, AZ Water’s 17th Annual Water For People Golf Tournament at Troon North Golf Club in Scottsdale will be history, ready to be recorded in the next Kachina News issue. But don’t put that golf bag in the closet. Get ready for a special golf event in Tucson; the 10th anniversary of the Water For People Southern Arizona Golf Classic on August 17, 2013 at Tucson National. This golf event is a favorite of golfers throughout the state. For registration information and sponsorship opportunities, see the flyers in this Kachina issue, or go to www.arizonawaterforpeople.org.

Other Upcoming Events!

November 2, 2013 - 9th Annual Water For People Hike-a-Thon, Phoenix South Mountain Park. This one just gets better and better. How much water can your team haul to the top of the mountain?

November 23, 2013 – Pedal With Purpose at El Tour de Tucson. Many opportunities for hard-core cyclers, not so hard-core cyclers, and the casual family pedal abound. You can also show your support by purchasing a Pedal With Purpose Team jersey. Competitor or not, this a great addition to any (biking) wardrobe. Proceeds support Water For People.

Go to https://www.azwater.org/wfp/cyclingjersey.aspx to purchase this cool jersey.

We are proud to announce that the Arizona Section of the American Water Works Association is the winner of a Section Membership Award - The Club Seven Award. The Club Seven Award recognizes the section that achieved the highest percent increase in new members during 2012.

The Section Membership Award was presented during Leading for Growth: Volunteer Appreciation and Awards Celebration at the 2013 Annual Conference and Exposition in Denver, CO on Tuesday, June 11.

The Membership committee has been working on new-member outreach programs and retention efforts for quite a while under the previous chairmanship of Troy Hayes and current chair Mark Gross with a lot of work by long-time committee members – Patty Kennedy, Brandy Kelso, Debbie Muse, Patrick Goodfellow, Tonja Lepur, and Uday Gandhe, with student outreach efforts from Jacqueline Shaw coordinating with the Young Professionals. Their efforts are paying off.

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The City of Casa Grande (City) is located in Pinal County, approximately halfway between Phoenix and Tucson, Arizona. Its economic base is a mix of retail trade, factory outlet shopping, manufacturing, and agriculture, with a population of approximately 49,000.

In the early 2000s, the City experienced rapid growth, and despite the economic slowdown that started in 2007, the City emerged as a center of economic growth within Pinal County. To accommodate the past and future growth potential, the City foresaw the need to have treatment and water reuse capacity to handle both current flows and the future growth, and recognized the need to expand their only water reclamation facility (WRF).

The City’s WRF was originally constructed as a mechanical plant in the early 1990s with a 3 mgd annual average daily flow (AADF) capacity and later expanded twice to 4 mgd and 6 mgd, with all three phases designed by Carollo Engineers. Due to rapid growth and the City’s vision to provide sufficient wastewater treatment capacity for future development, planning for the Phase 3 Expansion to 12 mgd AADF began in 2006 with a wastewater feasibility plan. The feasibility planning focused on future expansion alternatives, while taking into consideration newer technology and cost savings approaches rather than simply doubling the existing facilities. In 2008, the City and Carollo obtained funding ($62.5 million) from the Water Infrastructure Finance Authority (WIFA) for the project, which allowed the project to be bid by contractors in the fall of 2008. The lowest responsive bidder, Hunter Contracting, was contracted for under $49 million.

The Phase 3 Expansion included several improvements to the existing facility as follows:

- New 12 mgd AADF mechanical vortex grit removal system
- New fourth aeration basin (oxidation ditch-type configuration)
- Modification of existing aeration basins to increase aeration and biological capacity
- Four new 80-foot diameter secondary clarifiers
- New 12 mgd AADF disk filter facility with capacity to handle peak flows
- Expansion of the existing chlorine contact basin (CCB)
- New 12 mgd AADF on-site hypochlorite generation system (OSG) with capacity for peak flows
- New return activated sludge / waste activated sludge (RAS/WAS) pump station
  - Additional aerobic digester complex and aeration system
  - New solids handling building
  - One new gravity belt thickener to add to the existing two gravity belt thickeners
  - Three new belt filter presses with dedicated cake pumps
  - New solids handling odor control system
  - Additional standby generation capacity
  - Two new electrical service feeds from Electrical District No. 2
  - New Supervisory Control and Data Acquisition (SCADA) system, with programming by Carollo Systems

The design included new disinfection facilities to replace the existing gas chlorine system with the largest on-site sodium hypochlorite generation (OSG) system for a wastewater facility within Arizona. This approach uses salt to produce chlorine for the disinfection process, which reduces life cycle costs (compared to using bulk hypochlorite).

The design included several cost savings measures to optimize existing infrastructure, including modifying the existing aeration basins capacities from 2 mgd to 3 mgd each and the adding a new fourth basin, to bring the overall average daily capacity to 12 mgd. This approach saved approximately $20 million in capital costs.

The project was bid during the early stages of the economic slowdown, and the lowest responsive bidder (Hunter Contracting) provided a price that was below the Engineer’s estimate of construction. The Construction phase ran from the spring of 2009 with final completion obtained by the Contractor in early 2012. The team faced many challenges during construction, including maintaining the current plant operations (and meeting permit requirements at all times), while performing the construction activities. At the initial stages of the construction period, Carollo Engineers and Carollo Systems conducted a rapid asset management condition study. This study allowed the City to prioritize the replacement and rehabilitation of items that were not in the design scope and maximize the benefit of having Hunter Contracting on site. While these additional items may have prolonged the overall schedule of the project, it was a benefit to the City, and a testament to the collaborative approach of the City, Hunter, Carollo Engineers, Carollo Systems, and EUSI (providing contract operations support).
Coordination meetings were held by Hunter secondary clarifiers’ Extensive workshops and boxes upstream of the aeration basins and the valves at key transition areas such as splitter provided additional compartments and The design took into account these challenges the existing WRF during the construction activities. The major challenges involved maintaining the operators’ The new solids handling building houses thickening, dewatering, and cake loading to trucks. This building is operator friendly with access to the polymer feed systems, gravity belt thickeners, belt filter presses, thickened sludge pumps, and cake pumps, all within the single floor building. Currently, the City sends dewatered solids to their landfill for alternative cover use, which provides additional flexibility and control for the City.

Complexity

The Phase 3 Expansion included challenging aspects that were overcome by the entire project team. The major challenges involved maintaining the existing WRF during the construction activities. The design took into account these challenges and provided additional compartments and valves at key transition areas such as splitter boxes upstream of the aeration basins and the secondary clarifiers. Extensive workshops and coordination meetings were held by Hunter Contracting to coordinate the activities with the City operations staff and Carollo to make sure that the permit limits were met at all times during construction.

An example of designing to maintain the plant during construction, contractor execution, and operator coordination was the tie in to the new filter complex. The new filter complex included a concrete structure that was built around the existing filter effluent pipe that heads to the chlorine contact basin. This new structure was built along with two gates, one to send flow to the new disk filters, and a second to shut flow off to the chlorine contact basin. (Note that the disk filters send filtered water to the chlorine contact basin.) During construction, the disk filters were tested with water that was already filtered by the existing traveling bridge filters to assure meeting the permit to reduce the stress of bringing a new system on line. Once the disk filters passed the appropriate tests, the traveling bridge filters were taken off line.

Meeting and Exceeding Owner’s Needs

The City’s expectations were exceeded when the final construction project came in under budget. The City, Hunter Contracting, and Carollo worked together during the construction phase to improve other areas not in the original design. The low bid, as a result of the economic slowdown, allowed the team to rehabilitate areas that would have otherwise been slotted for future rehabilitation, which will result in lower operation costs. The facility was completed in 2012, in time for the recent increase of wastewater flows, which are now past the prior capacity of the WRF. This $50 million construction project commenced at the start of the Great Recession and was the largest design-bid-build wastewater project in the area during this period. Despite the weak economy and turnover that was experienced throughout the Arizona construction industry, the project teams were maintained and saw this project through to a successful completion. To save capital costs while increasing capacity, innovative approaches were employed, such as modifications to the biological treatment system. The disinfection system was converted from gas chlorine, which was a safety hazard, to on-site generation of chlorine using salt. The solids handling system was also improved to provide the City with options to dispose of biosolids with two beneficial uses (land application or as alternative cover at the City landfill). Finally, the reclaimed water quality was improved to Class A+ to allow increased reuse flexibility. The City, Carollo, and Hunter Contracting are extremely proud of this project. In addition to the AZ Water Wastewater Project of the Year for 2013, the Casa Grande WRF Phase 3 Expansion also received the 2008 Innovations in Water Resources Award for 3D Design (Bentley Be Inspired Awards) and the 2012 Project of the Year from WIFA.
WIFA News

Residents of Queen Valley, a small rural community in Pinal County will have a new source of water soon.

The community’s Domestic Water Improvement District received a grant from the Water Infrastructure Finance Authority (WIFA) of Arizona last month. The awarded funds will go toward the planning and design portion of a project to connect a new well to their water system, which serves approximately 1,500 people.

WIFA's planning and design grants are directed to communities with limited resources that need assistance in completing the planning and/or design phase of an infrastructure project. WIFA's Board of Directors recently approved $165,000 in planning and design grants to seven water providers around the state.

Vail Water Company, another small water provider in southern Arizona, will complete an energy audit and pump efficiency study. Results of the energy audit will include low-cost process improvement recommendations and suggestions for operating more efficiently. Since Vail’s project qualifies as “green,” the 40% local match requirement was waived. A waiver for the match is provided as an incentive to encourage green projects such as green stormwater infrastructure, water and energy efficiency improvements, and other environmentally innovative activities.

The full list of grant awards is:

- Harrisburg Utility Company, Inc. - awarded $12,000 to help with planning and design for replacement of a failing water storage tank.
- Brooke Water LLC - awarded $34,500 to investigate water loss from their Moovalya Keys and Lakeside Water Systems.
- City of Benson - awarded $35,000 to develop and design a SCADA system. SCADA (Supervisory Control and Data Acquisition) systems are computer systems that gather and analyze real time data and alert the water provider to water system status and potential problems, such as water leaks.
- Black Rock Water Treatment System - awarded $34,200 to plan for needed water treatment plant improvements aimed at decreasing total trihalomethanes (THMs), a disinfection byproduct of the water treatment process.
- Tonto Village Water Company - awarded $10,500 to have a preliminary engineering report completed to assist with making improvements to water lines and storage tanks.
- Queen Valley Domestic Water Improvement District - awarded $4,650 to engineer and design a new well.
- Vail Water Company - awarded $35,000 to complete an energy audit and pump efficiency study.

WIFA funds roughly $450,000 per year in infrastructure planning and design projects. Funding comes from Clean Water and Drinking Water Revolving Funds, which WIFA manages for the state of Arizona. The purpose of WIFA's Planning and Design Grant Program is to help prepare water and wastewater facilities for future construction of capital improvements. The grant program is designed to complement WIFA’s low-interest loan program.

Awards Planning and Design Grants

Arizona’s Water Infrastructure Needs Survey and Assessment

Imagine coming home after a long walk, turning on your faucet to grab a drink and finding that you don’t have water. Turning on your tap and enjoying good quality drinking water is something many of us take for granted. We use it to bathe, to cook, to clean, to water our plants. Access to clean and safe drinking water is something everyone can agree is a priority.

A report released early in June by the U.S. Environmental Protection Agency (EPA) shows that Arizona will need $7.44 billion in drinking water infrastructure improvements over the next 20 years.

Such a large number might make one wonder what is wrong with our water. But actually this is just the cost of maintaining what we already enjoy. Because the pipes that need repair are underground and treatment plants are hidden behind block walls, we typically don’t think about what it costs until we see our water rates rising. Rate increases usually go hand in hand with the infrastructure improvements necessary to ensure a reliable water supply.

The Drinking Water Infrastructure Needs Survey and Assessment report identifies the investments needed in each state through 2030. Much of Arizona’s infrastructure is over 30 years old, and investments in upgrading and repairing pipes and treatment plants, storage tanks and water distribution systems, are vital to public health and the economy. It’s important that Arizona’s infrastructure needs are evaluated and addressed so that Arizonans continue to enjoy the quality of life we’re accustomed to.

Every four years, each state conducts a survey of drinking water providers to determine what infrastructure they will need over the next 20 years to continue to provide safe drinking water to their customers. The Water Infrastructure Finance Authority (WIFA) of Arizona is responsible for collecting the information and submitting it to EPA. Consistent with all other participating states, Arizona gathered data from a statistical sampling of the state’s approximately 800 water providers. These data were used to calculate the total needs for the state.

Arizona ranks 16th out of the 36 states that completed a full needs survey. Our neighbor to the west, California, reported nearly $45 billion
in needs, about six times greater than Arizona’s. Indeed, California has a population that is about six times larger than ours. More people means more infrastructure and more money required to provide water.

The assessment shows that improvements are primarily needed in:
- Distribution and transmission (pipes): nearly $5 billion to replace or refurbish aging or deteriorating water lines
- Treatment: approximately $1.4 billion to construct, expand or rehabilitate infrastructure to reduce contamination
- Storage: $684 million to construct, rehabilitate or cover finished water storage reservoirs
- Source: $334 million to construct or rehabilitate intake structures, wells and spring collectors

This is consistent with the national outlook – distribution and transmission needs were the greatest and source needs were the lowest ranked nationally.

The national report helps determine the percentage of funding that WIFA of Arizona will receive from EPA. In 2013, WIFA received $18.3 million in federal funds for drinking water infrastructure. WIFA manages the State Revolving Funds for both drinking water and wastewater and is able to provide low cost financing and grants to ensure safe, reliable drinking water and proper wastewater treatment. The funds are sustained by the loan repayments that come back from WIFA's borrowers, along with bond proceeds and federal dollars. Over the last twenty years, Arizona has received $500 million in federal funds, yet has invested over $2 billion into drinking water and wastewater infrastructure for Arizona’s communities.

In essence, Arizona’s infrastructure dollars are recycled from community to community as loan repayments that come back to WIFA. It’s a smart way for Arizona to provide a sustainable source of funding to keep our infrastructure in good condition and preserve the quality of life that we enjoy.

WIFA has more than $100 million available for financing water infrastructure projects to ensure Arizonans have safe, reliable drinking water. Funding is directed to communities with the greatest need, whether those needs are financial or environmental.

Water Infrastructure Finance Authority

Despite the budget cuts the federal government is facing, WIFA continues to have a very large amount of funding to offer. Because WIFA has bonding authority, funds received from the federal government (EPA) are just a small portion of our financial portfolio. WIFA’s Triple A rating allow us to borrow money at the best rates available and pass those savings on to our customers in the form of below-market interest rates.

WIFA Offers:
- Top-notch customer service
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- Funding available year-round
- No application fees or closing costs
- No minimum or maximum loan amount
- Low interest rates (2.69%, public avg. in 2012)
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DEER VALLEY WTP — RESERVOIR INTERCONNECT PROJECT
2013 WATER SYSTEM PROJECT OF THE YEAR

Sreeram RENGARAJ, Uday GANDHE, Wilson Engineers;
Aimee CONROY, Mike KASEM, Raghu NANDAN, City of Phoenix

Project Background

City of Phoenix is quick to respond to the growing infrastructure needs with dynamic and robust solutions. Challenges presented by the needs for water storage capacity, operational flexibility and water quality control are taken into consideration when the City adds or modifies their water treatment plant and distribution system infrastructure. In order to meet the aggressive deadlines, the City uses alternate project-delivery methods. The Deer Valley Water Treatment Plant (WTP) — Reservoir Interconnect Project was one such project where the project needed to be completed within a short time frame of plant shutdown to minimize impact on water system demands. The City used the Construction Manager at Risk (CMAR) project delivery method with the project completed and placed in operation within a span of approximately 7 months and at a construction cost of approximately $ 6.5 Million. Kiewit Infrastructure was the CMAR Contractor selected by the City.

Original and Innovative Considerations

The intent of this pipeline project was to provide the City with increased flexibility in their ability to operate the reservoirs. Prior to this project, short circuiting occurred within either of the reservoirs if one of them had to be taken out of service for maintenance or repairs. To avoid short circuiting, the plant is limited with reservoir operation patterns. With the interconnect pipeline in place, short circuiting is eliminated as illustrated in Figure 1. The pipeline also allows the system to be operated in various patterns and maximizes the reservoirs storage capacity.

The entire process of the pipe installation was limited to a very short duration so that the connection to existing piping can be started once the plant is taken out of service during annual inspection. Therefore the design of the pipe excavation, backfill and installation methodology was very critical for successful completion of the work.

Besides limited time, there were physical limitations for the pipe installation. Challenging site conditions along with the need to install a large diameter pipe between two reservoirs in a limited space that must remain in operation warranted the need to think out of the box for the installation of the 96-inch pipe. The pipe was installed at an approximate depth of 23 ft. in a 15 ft. wide by 30 ft. deep trench. The Contractor developed a rail system (Figure 2) that was installed between the shoring boundaries for transport and placement of the pipe.

Another key challenge at this job site is the poor and soft soil conditions around the reservoirs. Continuous monitoring was conducted between the reservoirs to monitor soil conditions during construction. Data was analyzed in real-time by geotechnical engineers to evaluate the impact of the construction on the site. Frequency of monitoring was increased and backfill/trench conditions (addition of a cross bracing) were adjusted to mitigate impact of soils that was deemed unsuitable for pipe bedding.

Construction of pipeline and junction structures are completed and all permits including the interim Approval of Construction permit were acquired on time to allow the Deer Valley WTP to be placed in service as scheduled.

Social and Economic Considerations

The City of Phoenix has always considered its utmost priority to provide a very high quality of water to its customers. By providing operational flexibility, full usage of storage capacity and meeting CT requirements, this project is definitely a very important tool in enabling this goal is met. By choosing the CMAR project delivery method, the City has ensured that the project is completed in a challenging schedule minimizing unforeseen shutdowns.

The approach included construction of two junction boxes on existing reservoir pipelines and installation of a 96-inch pipeline between the two junction boxes. Finished water flows to the Eastern Junction Box and was then routed to different structures with several open/close operation of the sluice gates at the junction boxes and the reservoirs (Figure 3). The improvements allow parallel, series and single reservoir operation patterns of the reservoirs without impacting water quality or introducing short circuiting.

Prior to this project, the two reservoirs were connected by a reverse-sloped pipeline. A significant amount of water was trapped within the reservoirs due to the existing piping configuration. The new parallel operation pattern allows the reservoir to be operated separately therefore maximizes the reservoir storage capacity.

The interconnect pipeline was installed while the two reservoirs remain in operation. Connection between the new pipeline and existing pipes and construction of the junction structures were performed during the annual plant inspection. Extensive planning and coordination with environmental agencies was conducted throughout the construction phase of the project.

Complexity

Geotechnical investigations indicated that the project area is located near soft soil plumes (Figure 4). This meant that construction would require significant care and effort mainly to prevent unforeseen disruption to plant operations. Taking soft soils into consideration during the
design, CLSM slurry was used for pipe bedding and select material for backfill. Over-excavation was performed until suitable material was found. Contingencies were established to allow for additional excavation if a soft soil plume was encountered.

A robust drain system (Figure 5) was designed around the junction structures to prevent water puddling and to allow water percolation down to better soils. Continuous geotechnical monitoring was conducted during the entire duration of the project with inclinometers. Soft soils excavated during the project were discarded and select material was used for backfill.

A sound structurally designed shoring system (Figure 6) was also installed due to the limited site space for the installation of the pipe and the two junction structures.

The new junction boxes were located adjacent to existing structures such as the reservoirs, the Chlorine Building and the Chlorine Dioxide Building. Structural shoring system was installed to protect the existing structures.

**Meeting and Exceeding Owners Needs**

By planning extensively prior and during the course of construction, all the stakeholders were able to deliver a sound project that was completed under budget and on time for the City. In fact, a portion of savings from the project budget was later used for improving the paving condition in the reservoir area and grading around the site to better navigate storm water flows to the retention basins.
Pretreatment Committee Announcement

Pretreatment Training Workshop
November 6 and 7, 2013
From 8:00 am to 5:00 pm

TOPICS:
Overview of the National Pretreatment Program; Pretreatment Program Regulations: Legal Authority; Industrial User Identification and Classification; Industrial User Permitting; Prohibitions and Categorical Standards; Local Limits; Inspections and POTW Monitoring; Reporting Requirements; Data Management and Compliance Evaluation; Civil Enforcement; Criminal Enforcement; Resources and Funding

CONTACT:
Gus Lopez, 602-882-1750, Gus.Lopez@wilson-engineers.com

PDHs will be provided for the participants of the Workshop.
Pretreatment Committee Announcement

“Slug Loads into 23rd Avenue WWTP: Lessons Learned” Webinar
Tuesday August 13, 2013
From 11:00 am to Noon (1-hour)

SPEAKERS:
Marji Dukowitz (City of Phoenix Chief Water Quality Inspector),
John Jacobs (23rd Ave WWTP Process Control Specialist)

CONTACT:
Gus Lopez, 602–882–1750, Gus.Lopez@wilson-engineers.com

PDHs will be provided for the participants of the webinar.

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Top: 42-Inch Sewer Line Construction – Phoenix, Arizona
Bottom: Vertical Turbine Pump – San Tan Valley, Arizona
WATER TREATMENT GRADES 1 AND 2
1. What is the primary treatment process in a conventional water treatment that utilizes Chlorine?
   A. Coagulation
   B. Disinfection
   C. Sedimentation
   D. Filtration

2. What is the primary treatment process in a conventional water treatment that utilizes Chlorine?
   A. Coagulation
   B. Disinfection
   C. Sedimentation
   D. Filtration

3. What is the dosage in parts per million (ppm) when feeding gaseous chlorine at a rate of 35 pounds per day (ppd) to a flow of 2.4 Million Gallons per Day (MGD)?
   A. 1.0 ppm
   B. 1.2 ppm
   C. 1.5 ppm
   D. 1.75 ppm

4. What is the detention time in a basin measuring 72 feet long, 24 feet wide, and an average of 16 feet deep with a flow of 1.5 million gallons per day flowing through it?
   A. 1.0 hours
   B. 1.8 hours
   C. 3.3 hours
   D. 6.5 hours

5. What is the detention time in a basin measuring 72 feet long, 24 feet wide, and an average of 16 feet deep with a flow of 1.5 million gallons per day flowing through it?
   A. 1.0 hours
   B. 1.8 hours
   C. 3.3 hours
   D. 6.5 hours

WATER TREATMENT GRADES 3 AND 4
1. What is the primary hazard associated with feeding gaseous chlorine to water containing precursors?
   A. Formation of Disinfection By-Products.
   B. Failure to kill Cryptosporidium.
   C. Overdosing causing residuals to exceed 4.0 mg/L.
   D. Chlorine gas is an Extremely Hazardous Substance.

2. What is the dosage of Fluoride as Hydrofluorosilicic Acid (HFS) in mg/L when 25 gallons of HFS are used to treat 15.8 Million Gallons per Day (MGD)? Presume there are 1.93 pounds per gallon of HFS.
   A. 0.25 mg/L
   B. 0.37 mg/L
   C. 1.93 mg/L
   D. 25.0 mg/L

WATER DISTRIBUTION GRADES 1 & 2
1. How many Million Gallons per Day (MGD) are produced by a well that pumps at an average rate of 1150 gallons per minute for 15 hours?
   A. 1.0 MGD
   B. 1.5 MGD
   C. 2.0 MGD
   D. 3.3 MGD

2. Which material has been banned from usage in service lines by the EPA?
   A. Copper
   B. Galvanized steel
   C. Lead
   D. Plastic

3. What is the MCL for arsenic residuals in distribution systems?
   A. 1.0 mg/L
   B. 2.0 mg/L
   C. 3.0 mg/L
   D. 4.0 mg/L

4. How many gallons of water will a reservoir hold if it is 44 feet in diameter and 28 feet tall?
   A. 240,000 gallons
   B. 273,000 gallons
   C. 474,000 gallons
   D. 750,000 gallons

5. If a pressure gauge at the bottom of a standpipe reads 70 pounds per square inch (psi), how many feet of water are above it?
   A. 43 feet
   B. 86 feet
   C. 160 feet
   D. 231 feet

WATER DISTRIBUTION GRADES 3 & 4
1. What is the dose of Sodium Hypochlorite (as mg/L chlorine) in 5.2 Million Gallons per Day of water when 42 gallons of Sodium Hypochlorite are used? Presume the Sodium Hypochlorite contains 1.25 pounds of chlorine per gallon?
   A. 0.5 mg/L
   B. 1.2 mg/L
   C. 2.6 mg/L
   D. 4.3 mg/L

2. How many acre-feet (AF) of water are used by a community monthly if the average daily usage is 15.9 Million Gallons per Day (MGD)? Presume there are 30 days per month.
   A. 1,460 AF
   B. 2,600 AF
   C. 5,430 AF
   D. 8,500 AF

3. What is the EPA’s MCL for Arsenic expressed as parts per billion (ppb) in drinking water?
   A. 20 ppb
   B. 15 ppb
   C. 10 ppb
   D. 5 ppb

4. If a 250,000 gallon reservoir is half full and has a well pumping 1.5 MGD while the residents use 800 GPM, what will the level of the reservoir be in gallons after 4 hours?
5. What is the most common type of valve in distribution systems?
A. Ball valve
B. Diaphragm valve
C. Gate valve
D. Plug valve

WASTEWATER COLLECTION GRADES 1 & 2

1. What is the most hazardous gas produced in wastewater collection systems?
A. Carbon dioxide
B. Hydrogen sulfide
C. Methane
D. Chlorine

3. What is the velocity of wastewater in feet per second (fps) through a 12 inch force main with a flow of 1800 GPM:
A. 1.0 fps
B. 2.0 fps
C. 4.0 fps
D. 8.0 fps

3. How many cubic yards (cu. yds.) of spoil are removed from a trench 2.5 feet wide, 20 feet long and 7 feet deep?
A. 1.0 cu/yds
B. 3.0 cu/yds
C. 10 cu/yds
D. 13 cu/yds

WASTEWATER COLLECTION GRADES 3 & 4

1. The purpose of a check valve is to:
A. Adjust discharge flows from the pump.
B. Isolate the pump from the force main.
C. Prevent the force main from draining back into the wet well.
D. Prevent plugging of pumps.

2. Voltages greater than 220 Volts can seriously harm operators.
A. True  B. False

3. While testing a pump, it is discovered that the pump lowers a wet well that is 6 feet in diameter by 15 feet in 9.5 minutes. What is the production of the pump in Gallons Per Minute (GPM)?
A. 290 GPM
B. 480 GPM
C. 650 GPM
D. 834 GPM

4. What is the average slope in percent (%) of a wastewater collection line 500 feet long with an upstream invert elevation of 1597.50 and a downstream invert elevation of 1573.75?
A. 2.50 %
B. 4.75 %
C. 6.30 %
D. 7.66 %

5. Risk Management refers to:
A. Advise on safe operating and work procedures.
B. Industrial waste inspectors discovering industrial spills.
C. Damages resulting from accidental flooding of homes.
D. Whether stoppages will overflow manholes.

WASTEWATER TREATMENT GRADES 1 & 2

1. What is the detention time in a sedimentation basin measuring 75 feet long, 15 feet wide and 12 feet deep with an influent of 1.2 Million Gallons per Day (MGD)?
A. 1.2 hours
B. 2.0 hours
C. 3.5 hours
D. 5.6 hours

2. One factor to optimize operational control of aerobic wastewater treatment processes is to maintain dissolved oxygen above 2.0 mg/L in aeration basins.
A. True  B. False

3. What is the biological loading rate in pounds per day (ppd) to a circular trickling filter 56 feet in diameter with an influent flow of 13.2 MGD and a BOD of 238 mg/L?
A. 12,300 ppd
B. 26,200 ppd
C. 34,800 ppd
D. 56,000 ppd

4. What is the chlorine feed rate in pounds per day (ppd) to a wastewater treatment plant with an effluent flow of 8.4 MGD while dosing 4.8 mg/L?
A. 123 ppd
B. 210 ppd
C. 335 ppd
D. 480 ppd

5. Calculate the pounds of solids under aeration of a wastewater treatment facility with a mixed liquor suspended solids of 890 mg/L and the aeration basin measuring 120 feet by 40 feet by 18 feet.
A. 3,000 pounds
B. 4,800 pounds
C. 6,350 pounds
D. 9,800 pounds
The Ak-Chin Indian Community (Community) is nestled in the Santa Cruz Valley of South-central Arizona, approximately 50 miles south of Phoenix in the northwestern portion of Pinal County. Ak-Chin is an agricultural community comprised of over 920 tribal members. The name Ak-Chin, is an O’odham word meaning “mouth of the wash” or “place where the wash loses itself in the sand or ground” – a term referring to a method of farming that relies on washes. The Community’s first major enterprise was Ak-Chin Farms, which today harvests over 15,000 acres, making it one of the largest farming communities in the United States.

For years, the Community has relied on groundwater to meet their potable water needs. However, increasing levels of nitrate and other contaminants were rendering this once dependable source unreliable. The Community recognized the need to supplement their existing water supplies to provide a safe, reliable, and robust source of potable water. These improvements would be critical to improve quality of life, sustain on-going projects, and support current and future community and economic development goals. Consequently, during a period when many communities were forced to postpone critical infrastructure projects and delay needed upgrades to reduce costs, the Ak-Chin Community undertook their second largest infrastructure project ever— a new Surface Water Treatment Plant (SWTP) – to meet this need. The Community commissioned Plateau Engineering, Carollo Engineers, and PCL Construction to design and build their new 2.25-mgd “Sudagi Kenajunkud Ki” (O’odham for “House where Water is Filtered”), which would process a portion of the Community’s surface water allocation from the Santa Rosa turnout of the Central Arizona Project (CAP).

A Tailored Approach to Meet the Community’s Needs

In only 20 months, the design team and the Community transformed an agricultural field into a state-of-the-art 2.25-mgd initial phase (3.15-mgd ultimate) membrane filtration SWTP. The SWTP process provides consistent, high quality potable water and the flexibility to easily and cost-effectively expand future treatment capacity. The team also provided expansion of the Community’s existing infrastructure including almost 10,000 linear feet (LF) raw water transmission piping, as well as modifications/upgrades to an existing potable water pump station. The design team and the Community spent significant time, money, and effort to ensure the facility would be a showcase in the Community and surrounding area.

In general, the SWTP consists of the following components:

- Raw Water Pipeline
- Raw Water Canal Inlet (Secondary Feed Source)
- Raw Water Pump Station
- Self-Cleaning Strainers
- Rapid Mix Pumps
- lroculation Basins
- GE/Zenon 500D Membrane Facility
- Granular Activated Carbon (GAC) Vessels
- 0.75 mg Finished Water Reservoir
- Finished Water Pump Station
- Used Water Lift Station

Carollo involved the Community’s operations staff early in the project to evaluate and select treatment processes for the new SWTP. The project team facilitated workshops, tours, and hands-on equipment demonstrations with Community staff to share information and support decision making relative to appropriate treatment processes. Because of this approach, operations staff embraced these new technologies and remained actively engaged throughout the design and construction process.

While the facility includes a variety of high-end features, day-to-day operational functionality was at the heart of the design. Every aspect of the facility was closely coordinated to increase functionality. Process areas were configured on the site to minimize required infrastructure and to closely locate process areas that require regular operator attention. The design also incorporated...
several existing water infrastructure components (including an off-site storage and pump station facility) to maximize the value of the Community’s existing resources. In addition, the site was designed to provide future flexibility/functionality and support remote operation from the nearby water reclamation facility (WRF).

Specific to the process, the selected membrane technology (GE 500D series membranes) was identical to that employed at the Community’s new WRF – promoting consistency in operations, supporting cross training of staff, and minimizing spare parts requirements. Furthermore, the GAC system was designed with flexibility/optimization in mind to minimize costs associated with operation and maintenance. The total organic carbon (TOC) levels in the source water, as well as the Community’s water demands (and associated water age), vary significantly depending on the time of year. Consequently, to optimize the life of the carbon, the system was designed to allow operations staff to treat the entire flow, a portion of the flow (blend), or bypass the system entirely, depending on water quality drivers.

Finally, the design team used 3-D modeling to assist the operations staff in visualizing the proposed processes. 3-D models helped the operators to envision the size, configuration, and accessibility of the proposed water treatment facilities and equipment. 3-D design also served as an essential tool to better convey the aesthetic aspects of the design to a diverse group of Community stakeholders. Distinctive architectural features like decorative building trim (water-jetted steel banding of a water symbol created by Ak-Chin Artist Waylon Antone), integrally colored concrete, split face masonry, etc. were all vetted and approved by the Community as part of this process. This coordination was critical to obtain support from Community Council, Elders, and members regarding the facility’s “place” in the Community.

**Using Communication to Overcome Complexities**

With the multitude of challenges the team faced during design and construction of the new SWTP, this project would not have been a success without the efforts of all team members working together to find creative and innovative solutions. In an effort to maximize the overall value of the project, the Community elected to prequalify a group of select contractors and utilize a modified Design-Bid-Build approach, which included evaluation of bid pricing as well as several non-cost related factors. The team worked closely with the selected general contractor to quickly familiarize the new team members with the project nuances and incorporate new value engineering.

Community Council, Elders, Capital Improvements staff, operations and maintenance staff, the Community GIS Department, Ak-Chin Farms, and the Community Fire and Police Departments. In addition, bridging the gap between the Community’s history, culture, and tradition, and their progressive thinking, growth initiatives, and desired flexibility, provided a challenge. The project was located in the heart of the Community’s development district and was being constructed adjacent to, and simultaneously with, the Community’s Central Plant Facility and new Entertainment Complex. Consequently, communication was critical. The team met regularly with all stakeholders through weekly meetings and dedicated workshops designed to present information in a tailored format that was easily understood by the participants and promoted critical decision making. Every team member was vested in making the Community’s vision a reality from the start.

**Meeting and Exceeding Owner’s Needs**

The entire project team worked diligently to exceed the Community’s expectations. The project was ultimately delivered under budget and prior to the grand opening of the Community’s new entertainment complex. Since its commissioning, Community members have regularly commented on the improved quality and aesthetic characteristics of the water.

Community development has rapidly changed the way of life at Ak-Chin. Many of the Community’s Council members and elders vividly recall “bucketing” potable water from wells or driving miles for services many of us take for granted. Today, the Community’s growth and prosperity serves as a model for the Valley. Their new state-of-the-art SWTP provides a high quality, reliable, and safe source of drinking water, which supports the continued growth and prosperity of the Community as well as the greater Santa Cruz Valley. The facility and associated infrastructure will also play an important role in supporting future generations by promoting continued flexibility, growth, and economic development. Ak-Chin’s progressive and innovative thinking, commitment to their members, and dedication to preserving the environment portrayed during the design and construction of this showcase facility was truly a tremendous accomplishment for the Community.

The new 2.25-Mgd SWTP employs membrane filtration followed by GAC contactors, which provide consistent, high quality potable water for use throughout the community.

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SUCCESS AND FUN

By Paul HENDRICKS

PART 2
KEYS TO SUCCESS –
THE 17 PRINCIPLES OF PERSONAL ACHIEVEMENT

I recently read a book written by Napoleon Hill, “Keys to SUCCESS, The 17 Principles of Personal Achievement” that I would like to share with each of you in the spring and summer Kachina News magazine.

In summary, the 17 principles of success are as follows:

**Part 1**
1. Develop definiteness of purpose
2. Establish a mastermind alliance (or close circle of advisors)
3. Assemble an attractive personality
4. Use applied faith
5. Go the extra mile

**Part 2**
6. Create personal initiative
7. Build a positive mental attitude
8. Control your enthusiasm
9. Enforce self-discipline
10. Think accurately
11. Control your attention
12. Inspire teamwork
13. Learn from adversity and defeat
14. Cultivate creative vision
15. Maintain sound health
16. Budget your time and money
17. Use cosmic habit force

Think accurately with a positive mental attitude. Accurate thinking is based upon two major fundamentals:
• Inductive reasoning, based upon the assumption of unknown facts or hypotheses.
• Deductive reasoning, based upon known facts or what are believed to be facts.

Accurate thinking and common sense are in part the result of experiences. You can learn from your own experiences as well as those of others. We must learn how to recognize, relate, assimilate, and apply principles in order to achieve our goals.

1. Separate facts, fiction or hearsay evidence.
2. Separate facts into classes: important and unimportant.

Be careful of others opinions. The accurate thinker learns to use his or her own judgment and to be cautious, no matter who may endeavor to influence you.

Truth will be truth regardless of a closed mind, ignorance, or refusal to believe.

**Answer the following question. My commitment to use this principle in my life is:**

_________________________________________
_________________________________________
_________________________________________
_________________________________________
_________________________________________

Control your attention with a positive mental attitude. Controlled attention is organized mind power. It’s the highest form of self discipline. It is an act that can be obtained only by the strictest sort of self discipline.

It’s important that you practice controlled attention focused on your definite major purpose. Remember that the mind never remains inactive, not even during sleep. The objective of controlled attention is that of keeping your mind busy with thought material which may be helpful in attaining the object of your desire.

Keep your mind on the things you want and keep your mind off of the things you don’t want.

**Answer the following question. My commitment to use this principle in my life is:**

_________________________________________
_________________________________________
_________________________________________
_________________________________________
_________________________________________
Inspire teamwork with a positive mental attitude. Teamwork is a willing cooperation and the coordination of effort to achieve a specific objective. It is a system which coordinates all team players, resources and talents and automatically discourages dishonesty and unfairness, while it adequately compensates the individuals who serve honestly and unselfishly. Teamwork produces power, but the question of whether the power is temporary or permanent depends on the motive that inspired the cooperation. True teamwork builds individuals and businesses and provides unlimited opportunity for all.

That which you share will multiply; that which you withhold will diminish.

Answer the following question. My commitment to use this principle in my life is:

_________________________________________
_________________________________________
_________________________________________
_________________________________________
_________________________________________

Learn from adversity and defeat with a positive mental attitude. Every adversity carries with it the seed of an equivalent or greater benefit for those who have a positive mental attitude and apply it. Defeat may be a stepping stone or stumbling block, according to your mental attitude and how you relate to it yourself.

The person with the positive mental attitude reacts to defeat in the spirit of determination not to except the defeat of the moment.

Remember, the worst thing that happens to you may be the best thing that can happen to you if you don’t let it get the best of you.

Answer the following question. My commitment to use this principle in my life is:

_________________________________________
_________________________________________
_________________________________________
_________________________________________
_________________________________________

Maintain sound health with a positive mental attitude. You are a mind with a body. What your mind focuses upon, your mind brings into existence, whether it is financial success or physical health. Our brain controls our body. Recognize that sound physical health demands a positive mental attitude.

Answer the following question. My commitment to use this principle in my life is:

_________________________________________
_________________________________________
_________________________________________
_________________________________________
_________________________________________

Budget your time and money with a positive mental attitude. Intelligently balance your use of time and resources, both business and personal. Take inventory of yourself and your activities so that you discover where and how you are spending your time and your money.

I recently viewed a science fiction movie named “In Time”. I would recommend it for anyone who is trying to understand the value of money and the value of time. Time is real, money is not!

Engage in study, thinking, and planning time. Don’t waste your time or your money. Using your time wisely toward attainment of your objectives is the key to your future success.

Answer the following question. My commitment to use this principle in my life is:

_________________________________________
_________________________________________
_________________________________________
_________________________________________
_________________________________________

Use cosmic habit force with a positive mental attitude. Cosmic habit force pertains to the entire universe and is the concept by which the equilibrium of the universe is maintained through established patterns or habits. These cosmic habit forces are employed when you use your mind powers, whether they pertain to your conscious or your subconscious mind. Remember that all of us are ruled by our habits. Some habits are good, some habits are bad. Each begins in your mind consciously or subconsciously. Each can be developed or neutralized or changed at will through the proper use of your mind and application of your daily habits. Remember that it takes a habit to replace a habit. Developing positive habits will allow you to achieve your definite purpose or goal.

Sow an act, reap a habit. So a habit and you reap a character. So a character and you reap a destiny.

Answer the following question. My commitment to use this principle in my life is:

_________________________________________
_________________________________________
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My hope is that this issue of Success and Fun will help each one of us change the way we think and act in our daily lives. I am honored to share my perspective on “SUCCESS and FUN”. I hope to hear from you, contact me at phendricks@cox.net if I can be of assistance to you.
2013 Tournament Winners:
1. Sand Blasters (ING)
2. Dream Team (ING)
3. Sand 4 Breakfast (Carollo Engineers)

Interested in playing or volunteering in 2014? Contact Levi Dillon, ldillon@carollo.com or 520-668-0120
Summer 2013  AZ Water Association | 33

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Celebrating our 10th Year!!! Saturday, August 17, 2013

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Don’t miss the special anniversary award luncheon directly following

For more information, contact
Asia Philbin: asiaintucson@yahoo.com, 520-661-1548

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Corporate ($10,000, includes 8 player entries)
Platinum ($3,000, includes 4 player entries)
Gold ($2,000, includes 4 player entries)
Silver ($1,000, includes 2 player entries)
Copper ($500, includes 1 player entry)
Individual Player ($125 per player)

I/We cannot participate at this time. Enclosed is a contribution of $______________

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LEADERSHIP

By Fred KRIESS, Severn Trent Environmental Services

HOW TO KEEP YOUR CAREER ON TRACK / PEOPLE MAKE THE DIFFERENCE

During our journey together on how to become more effective leaders, thus far we have discussed five “traps” that could potentially derail a promising career. These were part of my top ten lessons on leadership and include:

➢ Wanting to be “Liked” by everyone,
➢ Letting the job go to your head (i.e. having too big of an “ego”),
➢ Failing to always tell the truth,
➢ Setting low expectations because you don’t think that your teams can do any better,
➢ Not reaching out and asking for help for fear that it would be seen as a sign of weakness.

Let’s explore another one of those traps that can severely impact a promising career,

“Pretending to know what you don’t know”

Now, I must say that statement may be a bit confusing and the best way that I could explain what I mean is again by sharing with you a real life experience that really did result in my career becoming off track for a period of time.

Many years ago, I was part of an international team preparing a proposal for the operations and maintenance of a large water treatment facility. Each of us on the team had clearly defined roles, mine being system operations and maintenance. As a team, we had rehearsed for a presentation to a large municipal client. During our presentation, some questions came up regarding construction and quality control. In the interest of being helpful (and honestly trying to make a good impression on my team mates and executives), I spoke up and offered what I thought was a proper response to the questions. I had ventured out of my comfort zone. Unfortunately, there was a much bigger picture (which I failed to see) and my response, severely jeopardized the message that we had been communicating to this client.

You see, I ventured outside of my area of expertise. Another expression is “Don’t go wandering around in the weeds!” In our careers, there is a natural tendency to make good impressions on others by how much that we think that we know, rather than what we know. Each one of us has unique talents and abilities and are part of a larger team. Stick to what you know and remember that it’s OK to ask for help, that’s actually a “sign of strength rather than a weakness.”

Harvey Mackay said “You don’t have to know everything as long as you know the people who do.”

The Servant Leader

A close friend of mine sent me this illustration which I think really does express the concept of a “Servant Leader”. The top part of the image is the “old school” or traditional style of leadership, which shows a supervisor/manager (“Boss”) directing his/her team people to pull him along with them. That’s the world in which I grew up in and spent most of my early career experiencing this style of management.

The bottom part shows how a leader works to pull his/her team along with them by leading the way and being down in the trenches. The leader is out in front and leads by example. Stated another way, by staying in front you can maintain the vision for your teams and direction to achieve goals and success.

Jesse Jackson expressed it best by saying - “Never look down on anybody unless you are helping them up.”

People Make the Difference

Lately, I have been reflecting on how much people truly do make the difference. When all is said and done, life (and work) is all about people doing business with other people. Organizations are nothing more than the sum total of their people. People create the culture and it starts with leadership.

A couple of stories may best illustrate how people can make a huge difference in our perception about organizations or companies. In my job, I travel frequently and recently flew two long trips on an air carrier that I had not flown on for some time. On the first trip, the flight attendants didn’t smile, and looked as if they were bored in their jobs and going through the motions. I got off the flight with a poor image of the airline. However on my return trip, the flight attendants had quite the opposite demeanor, seemed happy, attentive to service details and looked as if they truly were enjoying themselves and having fun.

Same airline, same brand/logo, but I left with a whole different image and it was again a reflection of the people and how they had conducted themselves.

Several years ago, my family and I were traveling on vacation in northern Arizona. It was late on a Saturday evening and we stopped in Williams Arizona for dinner. We got out leaving for Phoenix and seeing that we had a tire that was going flat and it was obvious that without some service, we would not be able to make it home.

We began to drive around Williams in an effort to get some help, but were turned away by some businesses/gas stations and so forth that were in the process of closing. We had just about given up hope, when we saw one gas station still open. We pulled in and were greeted by an attendant who was wearing greasy clothes and unshaven. My reaction was “Oh No”, this isn’t going to go anywhere.

continued on page 36
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I explained our situation and the man said that he would be happy to help us out and asked me to pull our vehicle around into his garage. We stood by while he handled the cash register, other customers who had pulled in for gas, etc. Whenever he had a spare moment he would come back for a few minutes at a time and work on repairing our tire. All the while, he was happy, cheerful and I still remember how he was encouraging my two sons on the importance of getting a college education.

I learned more about customer service from that gentleman than from all of the seminars, classes, programs that I have gone through in my career. The simple (and small things) make a huge difference.

After completing his work, I fully expected that he was going to charge me a premium for doing the tire repair and quite honestly I would have paid whatever he wanted to charge. I asked him what his charges were and he responded “Ten Dollars.” Needless to say, I was stunned by this and offered to give him a bit more. He refused and said that was their normal charge and that he didn’t believe in taking advantage of someone. I would say that ever since then, I haven’t forgotten the brand and if given a choice will always go to that particular retailer station for gas, whenever given the choice. There is an old expression, “Don’t judge a book by its cover” and the same can be said for people.

As leaders (and people), our attitudes and demeanor can make a huge difference in someone else’s life.

Let me close with a confession and admission regarding Balance:

In our last visit of the Kachina News, I had written about the importance of maintaining balance in our lives. I should share with you that upon showing a copy of the final draft to my wife, her words to me were “You need to practice this and pay attention to your own advice.” I have to tell you that this was a wake-up call and a true reminder to me about what I must do in my own life to ensure that I do keep a sense of balance and don’t become too much consumed in my career.

As we conclude this month, I leave you with a few more thoughts or quotes:

“If you feel like quitting, remember why it is that you started in the first place. Step back and see the goal that you established.” You will accomplish your goals one step at a time.”

“You never know when a moment and few sincere words can have an impact on a life” — Zig Ziglar

“What we see depends mainly on what we look for.” — Sir John Lubbock

“Your life does not get better by chance, it gets better by change.” — Jim Rohn

Finally — “Wake up with determination. Walk with conviction. Serve with passion. Treat others with kindness and respect. At the end of the day, go to sleep with a sense of satisfaction and a smile.”

Thank you for the opportunity to continue sharing more lessons of life and leadership. Please feel free to contact me at fkriess@stes.com if you have any questions or thoughts. Also I am very interested in feedback and ideas on ways that you have learned to become a better person and leader.

Have a super fantastic day and make it the best one ever!
CH2M HILL is the full-service delivery firm of Arizona with a track record of successfully delivering single-source engineering design, construction, and operations projects. We have the local resources, experience, and technology to provide sustainable and cost-effective water, wastewater, and utility management services as we have done for our valued Arizona clients since 1981.
GENERAL INSTRUCTIONS

Individuals interested in presenting at AZ Water’s 87th Annual Conference & Exhibition must **submit the following four documents by November 15, 2013:**

1. Complete the **Abstract Submittal Form**
2. Provide a **300-500 word count abstract** describing the subject matter in sufficient detail to allow evaluation of the proposed topic.
3. Provide a short paragraph description of the session presentation not to exceed 125 words. This summary will be included in the conference marketing brochure.
4. Provide a **short biography** of the presenter, not to exceed 60 words. This summary will be read by the moderator before the presentation. Generally, presentations will be limited to 25-30 minutes including time for questions.

SUGGESTED TOPICS

**WATER**
- Consumer Confidence
- Distribution Systems
- Groundwater
- Operations
- Source Protection
- Treatment Processes
- Water Conservation & Auditing
- Water Quality
- Water Resources Planning

**WASTEWATER**
- Bio-energy
- Biosolids Management
- CMOM
- Collection Systems
- Odor Control
- Operations
- Pretreatment
- Receiving Water Quality
- Treatment Processes

**WATER REUSE/RECHARGE**
- Advanced Treatment
- Benefits and Challenges
- Distribution Systems
- Dual Plumbing
- End Users
- Public Acceptance
- Regulators
- TDS Issues and Brine Treatment

**JOINT**
- Alternative Delivery/Design Build
- Construction Projects
- Facility Operations
- Green/Sustainability Issues
- Instrumentation and Control
- Operation Certification Training
- Public/Private Partnership
- Public Information
- Regulatory Issues
- Research Topics
- Security/Vulnerability
- Utility Management
- Watershed Management

SELECTION CRITERIA

Abstracts will be reviewed and judged on the basis of the following criteria:

— Describes the paper in a clear and concise manner.
— Significance of the work to a broad audience.
— Originality of the work, including new concepts, innovations, or data.

**ABSTRACT SUBMITTAL FORM** (Fill out Form or Create Word Document)

**TITLE OF PAPER:** _________________________________________________________________

List Main Topic and Sub-topic (closest to suggested topics listed above) __________________________________________________

If your presentation is for a Committee Block, List Committee ____________________________________________

Corresponding Author (all correspondence will be with this author)

Name: ___________________________________________________  Title: _____________________________________________

Employer: _________________________________________________________________________________

Address: _________________________________________________________________________________

City, State, Zip: ___________________________________________________  E-mail Address (required): __________________

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Check here if interested in receiving more information about the Young Professionals “Fresh Ideas” contest for accepted papers _____________

SUBMIT THE FOUR DOCUMENTS TO:

**OPTION 1: EMAIL TO:**

Mike Worlton
GHD
mike.worlton@ghd.com

**OPTION 2: BY USING AZ WATER WEBSITE**

2014 Annual Conference
http://www.azwater.org