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MISSION: Provide value to our membership and the public through education, training, and public awareness regarding enhancement of Arizona’s water and environmental resources.
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Having just returned from the 29th Annual Tri-State Seminar, held September 24-26 at South Point Hotel & Casino in Las Vegas, Nevada... all I can say is WOW! FANTASTIC LOCATION, FANTASTIC PROGRAM, AND THANK YOU EACH AND EVERY VOLUNTEER!

A landmark decision was made by AZ Water, CWEA and NWEA to move to South Point with the goal to improve facility use in order to have adequate space for the attendees, participants, registration, and exhibitors to ensure an effective, informative, and enjoyable seminar. As a result, attendance increased by 400 over last year and the exhibit hall was sold out within a week. With over 175 one-hour classes to choose from, plant tours and a safety workshops; the Program Committee delivered an outstanding program.

The concept of the Tri-state Seminar was introduced in 1985, when a meeting was held in Yuma, Arizona with representation from California Associations - California Water Environment Association (CWEA) and Colorado River Basin (CORBS); and Arizona, which was Arizona Water Pollution Control Association (AWPCA). The recommendation was to have a training seminar in Laughlin, Nevada. This meeting was considered the foundation for the development of the Tri-State Seminar.

As a result, Arizona, California, and Nevada were drawn together by the common need to provide continuous education for their certified operators and professionals at a reasonable cost and with a potential to earn over 20 credit hours. This philosophy still holds true today and is the foundation that the current sponsoring associations (AZ Water, CWEA and NWEA) strive to achieve.

Through the years, processes, standards, and technology have changed. And with that, Tri-State continues to focus on providing the operator/professional the latest in work practices, techniques, and regulatory requirements while learning from the opportunities of networking in order to resolve and explore issues. Imagine all this in the spirit of education!

Today, the Tri-State Seminar continues to focus on education credits by a dynamic group of volunteers from Arizona, California and Nevada - consisting of an executive board, committees, moderators, monitors, and speakers. A big thank you goes out to them for their continued involvement in making this seminar possible every year.

Although the Seminar just concluded, planning has already begun for 2014. Did you know that it takes over 100 volunteers to coordinate Tri-State? Won’t you consider investing you time and talent by volunteering for one of the committees? Go to www.tristateseminar.com to view the list of committees and volunteer opportunities available.
Thank You

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Cindy Martinez, Hector Perez, Annette Duarte, Adam Zendejas

Steve Davis, Program Volunteer
With the kids back in school and as the hot days and nights start to give way to cooler temperatures, I find my family settling back into the normal (if you can call anything with small children “normal”) daily routine that gets interrupted by summer craziness. The swim parties and summer camps replaced with homework and football. It’s really a great time of year that provides me with a renewed energy to set new priorities.

I am setting a path with my priorities and I hope to inspire you to take on a new priority by being an active AWWA (and AZ Water) member. You may recall that I discussed in the last Kachina News that AWWA has updated their strategic plan. One of the Strategic Goals is “Membership Engagement & Development”. AWWA strives to be the “association of choice for water utilities, professionals, and organizations.” The strategic objectives, in addition to expanding AWWA membership numbers, are mainly focused on adding value and benefits to AWWA members. I’m sure many of you understand the value that AWWA gives by having information available when you need it. This can include information provided in the Kachina News, The Journal, and Opflow. It may also include the use of AWWA Standards, Manuals of Practice, or one of the many books available through AWWA. There are also various online webinars and eLearning now available in addition to the traditional learning found at a variety of conferences and seminars.

Whatever your need, AWWA has the technical resources to help guide important aspects of your job and career. But is that all AWWA is about – getting information to members? I personally don’t think so. AWWA is about what you make it to be. It’s about the hundreds of professionals that volunteer to be a part of AWWA. Volunteering can be as small as helping on a local AZ Water committee to as big as being the chair of an AWWA committee. Volunteering comes in all sizes and shapes to fit the amount of time and effort you can give. AZ Water and AWWA have a plethora of local and national volunteer opportunities to fit your individual water passion whether it be in distribution or treatment or one of the many other aspects of water.

I have found that the greatest benefit I receive from my AWWA membership is through volunteering. I challenge each of you to make a new priority this fall to get involved and make a difference in the value you receive from AWWA because YOU are AWWA!

“We make a living by what we get, we make a life by what we give.”

Winston Churchill
The Partnership for Safe Water is a voluntary utility program with a mission of improving the quality of drinking water delivered to customers by optimizing treatment plant and distribution system operations. The program is sponsored by six prestigious drinking water organizations including: AWWA, US EPA, Association of Metropolitan Water Agencies (AMWA), Association of State Drinking Water Administrators (ASDWA), National Association of Water Companies (NAWC) and the Water Research Foundation (WRF). The Partnership’s comprehensive self-assessment and optimization programs provide utilities with the tools they need to improve performance beyond even proposed regulatory levels.

The Treatment Plant Optimization Program is open to surface water filtration plants of all sizes and process configurations and is focused on reducing treated water turbidity to protect public health. The Distribution System Optimization Program is open to any water utility that applies a distribution system disinfectant and is focused on evaluating and optimizing distribution system performance based on a variety of parameters, including disinfectant residual. Low annual subscriber fees are based on population served and cost utility customers less than a penny per year, while providing a measureable improvement in drinking water quality.

Partnership utilities receive public recognition as they progress through the program’s phases and reach optimization milestones, demonstrating their commitment to improving water quality and protecting public health. Join the more than 220 Partnership utilities that participate in and benefit from the Partnership for Safe Water’s utility optimization programs. To learn more, visit www.awwa.org/partnership or contact the Partnership at 303-347-6169.

Partner with us to Optimize Operations: The Partnership for Safe Water

Optimize Operations and Improve Water Quality

Systems that complete the Partnership’s self-assessment process reduce filtered water turbidity by an average of over 60% and are recognized nationally. That’s an impressive accomplishment—one that builds confidence with customers, community, and regulators. Subscribe today and join the hundreds of utilities that rely on our guidance to optimize performance and deliver safe, high-quality water to millions.

The Partnership is an alliance of six prestigious drinking water organizations.

www.awwa.org/partnership
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): ___________________________

Phone: ___________________________ Fax: ___________________________

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
Water
is the sustaining element of all Life

For more than a century, Pirnie/ARCADIS has helped local communities address water issues with an emphasis on sustainability and environmental protection.
We have had a nice monsoon season in the high country of Arizona this year – it’s about time to finally be above the 30 year average for rain! The Summer brought plenty of apples and elk calves – now fall’s blanket starts to settle and envelop us.

Last issue I wrote about a lobbying trip to Washington D.C. and the wonderful world of WIFIA. WIFIA would provide monies for badly needed public infrastructure and create jobs! Don’t we need jobs in the water industry? The main point of WIFIA is this – because the borrowing costs incurred by communities would be lower than typical municipal bond market rates, communities and their ratepayers would save millions of dollars in interest and finances charges over the life of their WIFIA loans. This will help communities stretch their own dollars to make more local resources available and simply ease the burden of increase service rates on the customer – you and me.

On May 15th, the U.S. Senate passed S. 601, the Water Resources Development Act (WRDA) containing a title creating a WIFIA pilot program, by a significant margin: 83-14! Unfortunately, both of our Arizona Senators (Flake and McCain) voted no on the bill. The bill now is awaiting House hearing and approval. Hopefully, Arizona’s Representatives in the House will have heard AWWA/WEF’s message and vote in the majority to pass WRDA and WIFIA.

The House Transportation & Infrastructure Committee has indicated that it will begin moving WRDA in September, with plans to put it on the House floor in October. The WIFIA provision is unlikely to be in the House WRDA bill, but it may be offered as a stand-alone bill, in addition to already being a part of the Senate passed WRDA bill. And both the House and Senate tax writing committees said that this fall they will begin working on major tax reform legislation, which may include changes to the tax-exempt status of municipal bonds (which WEF opposes) and lifting the cap on Private Activity Bonds for water infrastructure projects (which WEF supports).

Please Let People Know: Water Puts America to Work! Help educate the public and decision makers that Water Puts America to Work – Investment in Water Infrastructure Creates Jobs, Drives Innovation, and Safeguards Public Health. Ask your elected officials what they intend to do to address our nation’s water infrastructure crisis; ask them to put America to work by making water a top priority. Visit WaterForJobs.org for more information on how you can support this effort.

WEFTEC 2013
I hope you are making your plans to attend WEFTEC in Chicago, October 5th – 9th. In many ways the 87th annual WEFTEC will be like the previous 86 – packed with reliable and useful information on water and wastewater operations and engineering, as well as a great exhibition hall! But much has changed this year as well:

Fees: All registration fees have been reduced and simplified for WEFTEC 2013. In addition, for WEFTEC 2013 there is no charge for exhibition-only registration, which is provided compliments of WEF and the WEFTEC exhibitors.

Technology: Attendees can benefit from this year’s WEFTEC Mobil App, which has been completely reimagined and redesigned. The App features are very robust and sure to add to your WEFTEC experience.

Special Focus: This year includes special focuses for two particular groups – operators and stormwater professionals. Since the beginning of sanitation, operators have been the backbone of effective treatment. WEFTEC exists in large part to help operators find the information they need. On the other end of the spectrum, stormwater professionals are relative newcomers to the wastewater sector. WEF has co-located the Stormwater Congress with WEFTEC 2013 to foster continued interaction and collaboration.

I hope to see you all at WEFTEC 2013 – I will be attending the House of Delegates before the conference and moderating a session during the conference. Please come up and say hi and let me know if I can do anything to help you enjoy the 87th WEFTEC even more!

REMEMBER – Together we are AZ Water!
IS WASTEWATER REUSE IN YOUR PLANT'S FUTURE?

Today’s water treatment standards are rapidly changing, requiring plants to implement adaptive water management strategies. Aqua-Aerobic Systems’ experience in Biological Processes and Filtration provide you with the most advanced technologies for reuse applications and meeting the most stringent effluent demands. Whether utilizing filtration following a secondary biological process or implementing a “green” approach to your plant’s water reuse initiatives, we have the ideal solutions to meet your water reuse goals.

AquaSBR® Sequencing Batch Reactor
- Enhanced nutrient removal in a single unit process prior to tertiary filtration or microfiltration.

Aqua-Aerobic® MBR Membrane Bioreactor
- Enhanced biological nutrient removal via time-managed sequential aeration in a compact footprint.
- Direct filtration of MLSS with submerged membranes achieves solids removal to submicron levels.

AquaDisk® and AquaDiamond® Cloth Media Filters
- Featuring OptiFiber® pile cloth media, ideal for reuse/recycle applications.
- Low backwash rates.
- Less operator attention and maintenance required.
- Small footprint.
- Disk and diamond configurations available.

AquaMB Process® Multiple Barrier Membrane System
- High level nutrient removal utilizing advanced biological treatment followed by cloth media filters and membranes.
- Less membrane area required

IntelliPro® Monitoring and Control System
- Integrated comparative analysis.
- Automatic chemical addition.
- Proactive operator guidance via the BioAlert™ process notification program.

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P 480.488.3009 | F 480.488.2525
john@iessouthwest.com | www.iessouthwest.com
Mike Ambroziak Joins CPM

Construction Product Marketing (CPM) is pleased to announce Mike Ambroziak, P.E. as a managing partner to their company. Mr. Ambroziak’s technical experience in the water and sewer industry providing design, project management, assessment services, and rehabilitation will provide essential elements as CPM further expands its offerings of both products and services throughout Arizona, New Mexico, Las Vegas and El Paso.

As a graduate in Civil Engineering from Arizona State University, Mike has spent the past 13 years in Arizona providing quality services to a variety of clients. His experience and understanding of assessment in both water and wastewater applications will allow CPM to provide clients additional solutions for their new and aging infrastructure.

Construction Product Marketing, LLC, is a manufacturer’s representative that offers a complete line of products and services for the water and wastewater industry. With the addition of Mr. Ambroziak, they will be adding assessment and rehab systems and services to their current offerings in distribution and mechanical plant systems, as well as equipment. In addition to the quality valve and process solutions, the company offers unparalleled service for owners, engineers, and contractors in the markets they service.

Brown and Caldwell Hires Industry Executive to Lead Private Sector Business

Brown and Caldwell has named Rich D’Amato as Executive Vice President and Private Sector Enterprise Leader. D’Amato joins Brown and Caldwell from CH2M HILL, where he was a Senior Vice President for their $500 million Operations and Maintenance business group. During his 21-year tenure with CH2M HILL, D’Amato held various senior positions supporting the firm’s industrial and municipal operations and business development.

D’Amato will lead Brown and Caldwell’s Private Sector Enterprise, a unit that is fast-growing and now represents over thirty percent of the firm’s business portfolio. He will be a member of BC’s Executive Management team, and will be based at the firm’s Denver, Colo., office.

“Rich brings executive experience and a great track record of providing integrated project delivery solutions to private sector clients” said Craig Goehring, Chief Executive Officer.

D’Amato has a Master of Science degree in environmental systems engineering from Clemson University and a Bachelor of Science degree in civil engineering from SUNY at Buffalo.

Rich D’Amato can be reached at Brown and Caldwell’s Denver, Colo., office at 303.239.5400.

PCL Construction/Fann Environmental Aid in Emergency Restoration from Devastating Fire Near Prescott

On June 28, a lightning strike caused a small fire near the town of Yarnell, Arizona. Due to the remote location, the fire quickly grew prompting a rapid emergency response and evacuations of this small town with a population of under 700. This fire gained national attention on Sunday, June 30, when 19 of 20 members of the elite Granite Mountain Hotshots team were trapped by the wildfire and ultimately perished. This team was based in the City of Prescott, Arizona, and their deaths had a deep emotional impact to this community and the nation. The Vice President of the United States Joe Biden, Arizona Governor Jan Brewer, Homeland Security Secretary Janet Napolitano, a former Arizona governor, Senator John McCain and other local, state and federal officials were in attendance during the memorial ceremony.

As a result of the fire, more than 120 homes were destroyed. The town’s water service system also suffered damage and was stressed to its capacity, and perhaps beyond, fighting the fires. This resulted in loss of water service to a number of homes in the fire’s aftermath. A call came to PCL’s Water Infrastructure Group to aid in the emergency restoration of some of these services. With a current water reclamation plant project in the City of Prescott, Arizona, the Joint Venture project team of PCL/Fann Environmental led by Matt Brown, Project Manager, and Don Whitfield, Project Superintendent, immediately visited the town and met with the Yarnell Water District thus developing and putting into action PCL/Fann Environmental’s response plan. PCL/ Fann Environmental quickly mobilized labor, material and equipment in a volunteer effort to
start repairs. It was pretty amazing how quickly suppliers and subcontractors stepped up and donated labor, material and equipment to aid in this effort at PCL’s request. This is a true testament to PCL’s strong relationships with suppliers and subcontractors in the Arizona market.

Over the course of 10 days, PCL/Fann Environmental restored water services to numerous homes by repairing or replacing water service pipe lines, replacing fire-destroyed plastic meter boxes with precast concrete boxes, and installing new water meters. Four mainline valves had to be exercised and cleaned up for use in water system isolation. Existing asphalt was saw cut, removed and replaced with new engineered base and asphalt.

**Yarnell Progress**

The Yarnell Water Improvement Board expressed their gratitude for PCL’s efforts, saying, “Without the help of your hard working crews and your generous company, the little water system would not have been able to prepare for the return of the residents!”

The Water Infrastructure Group would like to acknowledge and thank the following PCL personnel for their direct involvement in the repairs:

- Matt Brown, Project Manager
- Don Whitfield, Project Superintendent
- Ben Hutchinson, Field Engineer
- Mario Martinez, Pipe Laborer
- Steve Drennan, Pipe Laborer
- Nathan Rush, Pipe Laborer

PCL would also like express our heartfelt appreciation to the City of Prescott and the following suppliers and subcontractors for their donations:

- City of Prescott – Trucking for Aggregates
- L&L Asphalt: Pavement Patching
- Empire Southwest: CAT 420 Backhoe
- Ferguson: Pipe and Fittings
- Todd Flick with Dana Kepner – Pipe and Fittings (paid for himself, not a company donation)
- Cemex – 25 tons of asphalt

**Ray Montoya Joins EEC**

Ray P. Montoya, PE, has joined Engineering and Environmental Consultants, Inc. (EEC) as Director of Water and Wastewater Services in Arizona. Mr. Montoya has over 15 years of experience in project management, planning design, and construction services for various water and wastewater projects and was previously with Kennedy/Jenks Consultants.
Due to a projected increase in industrial wastewater discharge in the Ocotillo area, the City of Chandler decided to build a new 20 million gallon per day (MGD) lift station and a 4.5 mile 36-inch HDPE force main. The lift station project is located northeast of the Ocotillo Water Reclamation Facility (WRF) near the intersection of Old Price Road and Queen Creek Road in southeast Chandler. The force main is located from the lift station site, south to Ocotillo Road, then east to the Airport WRF. The new lift station provides the City flexibility to convey wastewater flows between the Ocotillo WRF and the Airport WRF located about five miles from each other. The project greatly improves the way sewer flows and treatment processes are managed. Being able to convey wastewater discharges from different sources to different treatment facilities depending on the wastewater characteristics considering which one is more adapted for treatment gives the City and its citizens an incredible tool to improve efficiency when treating a precious resource. Figure 1 provides a layout of the new lift station and ancillary facilities located at the Ocotillo WRF site.

In addition, a new water transmission main was also included in the design and construction project. This includes 3.25 miles of 24-inch ductile iron pipeline in Ocotillo Road parallel to the force main and is designed to improve the water supply system redundancy. Figure 2 presents the alignment of the force main and transmission main from the OWRF/AWRF Lift Station to Airport WRF. Depending on transmission main valve positions, the supply source for the pipeline is from either the City’s Pecos Water Treatment Plant or the Gilbert – Chandler Santan Vista Water Treatment Plant.

Innovative Solutions To Unique Challenges

What makes this project unique is the incorporation of redundancy and ability to use the lift station to separate industrial waste flows from domestic sewage or to combine them prior to distribution to the City’s WRFS. The combination of the structures, tie-ins, automated equipment, and programming gives the City the utmost flexibility for sewer collection and conveyance of flows either separately or combined to different treatment facilities. The lift station can be operated either as a single wet well or can be separated into three wet wells to operate as three individual lift stations. Controls for the lift station are based either on scheduled flows or level. Figure 3 provides a schematic representation of the lift station and sewer distribution options. The built-in flexibility in this project is a very important upgrade according to John Pinkston, the City of Chandler Wastewater Facilities Operations Superintendent, “The flexibility, added capacity and the expected reliability of this project make the system able to handle the current and future wastewater flow increases from all customers (mainly industrial) in the City.”

The material used for the construction of the pipeline (HDPE) has much lower friction loss when compared with other materials typically used for this size. Lower friction losses would reduce the horse power required and therefore uses less energy to convey flows. The pump station is designed to carry between 2 and 20 MGD flows. Therefore, the pump station design incorporated smaller and larger size pumps. This design further enhances energy efficiency by utilizing the correct equipment for the range of flows desired. The odor control system identified for this facility does not use any chemicals, thereby eliminating the need for chemicals typically used for the operation of this facility.

The use of advanced methods of pipe installation were developed with the HDPE pipe vendor and pipe fusing sub-contractor to accommodate fusing of the 3-inch wall thickness required for the HDPE pipe on account of the force main working pressures and external earth/roadway loads. The geotechnical conditions combined with the size of the force main HDPE fusing machine resulted in significant challenges. The size of the fusing machine made it necessary to fuse the long HDPE lengths above grade. If fusing had been done in the trench, the trench widths would have been appreciably greater.
and resulted in more disruption to the adjacent infrastructure and roadway. Fusing HDPE pipe on the surface required long pipe lengths (more than 80 feet long) that needed to be lowered into an open trench after fusing together and correspondingly long trenches ready to receive the fused lengths. Figure 4 illustrates the fusing equipment in action.

**Design And Construction Provides Opportunity To Win Public Support**

**Lift Station Highlights:**

The City of Chandler envisioned the new Lift Station to provide much needed flexibility in their wastewater collection system and also allow them to plan ahead for infrastructure needs due to potential growth in the west part of the City. It is also anticipated that industrial discharges may increase in the City’s sewer collection system altering the wastewater constituents entering the WRFs. This will lead to process impacts at two of the City’s WRFs. In order to minimize and mitigate the impacts, the team incorporated two additional features. First, the flexibility in the lift station that can function as one pump station or three pump stations depending on the configuration of the gates at the lift station and at adjacent structures. This allows the City to select the amount of industrial wastewater that can be sent to either of the two WRFs. Secondly, a supplemental Carbon Source Facility was built to augment the low COD in the industrial wastewater.

The City has a no tolerance policy toward odor nuisance on neighbors. The team ensured that odors during sewer bypass operations were treated. This effort was discontinued after confirming that the bypass operation did not generate odor or odor complaints in the neighborhood. The project team was very sensitive to the visual impact of the new facility. Efforts were made to blend the lift station and its bridge crane with surrounding architectural features. Thus, the lift station bridge crane was covered with a canopy roof system and visually blended it with the Ocotillo WRF buildings by using similar colors and patterns. Landscaping around the facility was included to match surrounding features.

**Force Main and Transmission Main Highlights:**

The City of Chandler was very conscientious of the impacts to the citizens resulting from a 4.5 mile long pipeline construction project. Careful planning was required to minimize impacts on traffic, neighborhoods and businesses in a part of the City which includes large industrial customers, residents and schools. The City and the design / construction team made this item their top priority. Construction in a public right-of-way required careful consideration of the impacts to traffic, public safety and a proactive public outreach program. The project team including a public relations sub-consultant, worked closely with the City’s Communications and Public Affairs (CAPA) Office to develop an extensive public relations plan including preconstruction newsletters, public meetings, meeting one-on-one with business leaders, school officials, school transportation, home owner associations, and the Sedgig Sports Complex employees and users who would be impacted by the construction corridor. In the interest of transparency and educating the public on this project, the City conducted regular meetings with the facility’s industrial and residential neighbors and shared project information including maps, alignment, and timelines. In an effort to minimize disruption in the construction corridor and optimize cost, the project team also constructed the new transmission main along with the force main work, thus avoiding repeat roadwork and closures. In addition every effort was made to reduce construction wastes by minimizing the roadway demolition that was needed as well as reusing the local materials as backfill whenever possible.

Every step of the public information effort provided an avenue for people to ask questions and address concerns. A project website, hot-line and e-mail were also set up to receive comments from public. During the entire duration of construction, the team’s representative continued to meet with impacted businesses and residents, addressed questions and concerns voiced through the project hot-line, updated the project website with the latest information and sent out e-mail blasts to inform the impacted public of the planned activities, traffic changes and potential traffic delays. Additional measures such as pipeline crossing of roadway intersections at night and pipe installation using trenchless construction methods were also incorporated into the project to minimize disruption to traffic in key intersections. Figure 5 demonstrates the boring machine in action at a trenchless crossing. The force main included four different trenchless crossings including under the Union Pacific Railroad and three major intersections. The transmission main project included trenchless crossings, at the Union Pacific Railroad and under the SRP Consolidated Canal.

In essence, the public relations effort successfully increased public awareness about the project as well as provided a positive public perception despite the unavoidable disruptions to traffic and accompanying delays.

**Fast Track Schedule Met Using Multiple Design And Construction Packages**

In order to meet upcoming sewer flow increase in the south west Chandler area, a fast track design and construction process had to be implemented. Design documents were issued in six packages.

The first package for the lift station involved major concrete work. A close coordination between the design team and the contractor also allowed procurement of the main lead items early in the design phase. The concrete work involved complex planning as two of the ancillary structures had to be connected to a 66-inch sewer pipe near the Ocotillo WRF, an end of the line treatment plant. Incoming sewer had to be diverted around the job site via a temporary pump station (Figure 6). Suction lines to the temporary pump station had to be inserted into the top of the influent pipe after removing several coupons. Operations of the temporary pump-around demanded a very close coordination between the

---

**Figure 4**

- The force main in action at a trenchless crossing.

**Figure 5**

- The transmission main project included trenchless crossings, at the Union Pacific Railroad and under the SRP Consolidated Canal.

**Figure 6**

- Fast track schedule met using multiple design and construction packages.
plant operation personnel and the project team for several months. Upon completion of the structures, the coupons and pipe were carefully repaired by welding PVC sheets to the existing T-locks and reassembled before placing a reinforced concrete mat on top of the line before backfill.

Another challenge was the excavation pit to allow the 43.5-foot deep lift station to be erected. Shoring walls around the work area were made up of up to seven rows of 40-foot long soil nails, wire mesh and shotcrete as shown on Figure 7.

The second package for the lift station included all mechanical and electrical design. Several interconnected headers of different size were connected with various tees and valves to allow the lift station to be operated either as a single pumping facility or as three independent wet wells.

Therefore, depending on the operation mode, sewage from different sources can be sent to three different locations at once: to the Airport WRF via the new 36-inch force main and via an existing 24-inch force main, and directly to the adjacent Ocotillo WRF. A pig launching station was included in the design to allow the City to clean and maintain the newly installed 36-inch force main.

The remaining four packages included early material procurement, trenchless crossing, and open trench for the force main and for the transmission main.

Due to the number of operating modes and the complexity of the programming involved in the completion of the lift station, the project team tested the lift station around the clock for over two months to ensure the design intent was accomplished. Coordination was crucial between the City, the treatment facilities staff and the project team during the commissioning phase.

Successful Completion Of Project

The City embraced the challenge to provide a means to handle the additional load on its water delivery and wastewater treatment systems due to the goals of a major new industrial customer facility that was scheduled to come on line June 2013. This project met those needs and was completed on-time and within-budget with a compressed design and construction schedule through a cooperative partnership between Owner, multiple engineering consulting firms (Wilson Engineers, Black and Veatch), and contractors (Achen Gardner, MGC Contractors).

<table>
<thead>
<tr>
<th>PROJECT HIGHLIGHTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ocotillo WRF / Airport WRF Lift Station</strong></td>
</tr>
<tr>
<td>Project Duration: 2 years</td>
</tr>
<tr>
<td>Construction Cost: $18 Million ±</td>
</tr>
<tr>
<td><strong>Force Main and Transmission Main</strong></td>
</tr>
<tr>
<td>Project Duration: 2 years</td>
</tr>
<tr>
<td>Construction Cost: $21 Million ±</td>
</tr>
</tbody>
</table>

The lift station and force main / water transmission line were placed in operation as scheduled in June of 2013, just in time to receive additional loads from industrial sources and has been running successfully.

“The project team consisting of multiple consultants and contractors formed a well-oiled cohesive unit displaying an unparalleled level of commitment to the project from day one leading to a very successful project for the City of Chandler.”

John Knudson, MUD Utilities Engineering Manager, City of Chandler.

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**TRIVIA QUESTIONS**

**From the Office of the AZ Water Association Historian**

A. Many think that the first "submarine" used in war by Americans was in the Civil War. In actuality, the idea came up and was tried much earlier. When?

B. What was the first state in the United States to require automobile license plates?

C. The passenger ship Titanic sank at about 2:20 am on 15 April 1912. When was the ship’s wreck located — i.e., found on the bottom of the Atlantic?

D. When was the United Parcel Service founded?

E. When was news of the "gold rush" in California (1840’s) made known to the general populace —compared to when gold was actually discovered in that area?

See answers on page 42
AirPro Max® air valves offer maximum protection for your pipeline. Seat leakage and float mechanism failures do not occur with this robust design. And these new valves offer the following features as standard:

- Ductile Iron Bodies & Covers
- 316 Stainless Steel Cover Bolts, Floats & Trim
- Hoods or Threaded Caps

AirPro Max® air valves for clean water applications are all NSF61/372 certified. All AirPro Max® air valves are manufactured to meet or exceed AWWA standards.
WATER FOR PEOPLE COMMITTEE

A recent report by the University of North Carolina Chapel Hill Water Institutes contests the United National Millennium Development Goal (MDG) estimate that 783 million people worldwide don’t have regular access to safe drinking water. The Water Institute’s findings put this figure more accurately at 1.8 billion people, more than double the number proposed by the MDG.

The result of these shortfalls is devastating. Every day, more than 6,000 people in our world die from water-related illnesses—nearly two million each year—and most of them are young children. Women are most impacted by the lack of access to water and frequently travel many miles from their homes to collect water for their families, preventing them from going to school or contributing to the family income. The water crisis is hitting the most vulnerable populations—the world’s poor. About half the world’s population lives in abject poverty on less than $2 per day. Preventable water-related diseases are killing them and arresting development in their communities.

The solution to this crisis is really quite simple. It’s about helping people help themselves so that solutions last and don’t break down. Water For People is committed to helping entire districts with many communities take the critical first steps out of poverty with the development of sustainable access to water that reaches Everyone and lasts Forever.

“Everyone, Forever” is at the core of who Water For People are. With the AZ Water’s support, they are accomplishing the goal in a growing number of communities around the globe. AZ Water and the Water For People Committee’s efforts raising funds will continue to play a vital role in continuing this success. This summer, AZ Water and the water community have raised approximately $40,000 to realize “Everyone, Forever”. And we are NOT done. Here is what happened and what is coming up.

Water For People Golf Tournament – Phoenix

June 22 2013... 100 golfers descend onto the prestigious Troon North Golf Club for the 17th Annual AZ Water | Water For People Golf Tournament Presented by ARCADIS on a fantastic day in Scottsdale, Arizona.

The tournament was a huge success again raising more than $10,000 for Water For People and the competition was intense. Jim Albu, Mark Seamans, Trent Kelso and Alex Hewett of Team Brown and Caldwell won it all with an amazing score of 52 (6 shots better than last year’s winning score!). Splinter Creative’s foursome of Norm LeBlanc, Brandon Cook, Kyle Spahn and Ed Williams, could not get over the hump again this year and took the 2nd Place spot with a round of 55. Last year’s First Place Winners, Team CAP, with Dave Modeer, Brian Henning, Dave Mahaffay and Tom McCann captured 3rd Place with a score of 56. In the skills competitions, the longest drive contest...
was won by Jessica Dresand and Dave Sobeck. The closest to the pin contest winners were Chuck Ritter, and Greg Sistek. A Par-3 challenge, sponsored by Dixon Golf, a valley based 100% recycled golf ball manufacturing company, raised an additional $150 for the Water For People.

The real winner was Water For People and the communities it helps in its program countries. We would like to thank all our sponsors, golfers and door prize donors for making this possible! We hope that your support will continue to grow in years to come. A special thanks go to the numerous volunteers who work tirelessly before, during, and after the tournament. A few pictures from this memorable event are shown on page 68. All the pictures from the golf tournament can be viewed and downloaded for free from http://picasaweb.google.com/AZWaterForPeople.

After leading this tournament for the past four years, Venkat Radhakrishnan has moved to California. We thank Venkat for his leadership and help with continuing to grow this event. We wish him well in all his future endeavors.

The 18th Annual AZ Water | Water For People Golf Tournament returns to Troon North Golf Course in 2014 led by Dave Christiana (dchristiana@cox.net), Michelle Marsh (michelle.marsh@hdrinc.com) and Bhaskar Kolluri (bkolluri@burnip.com). Please contact them for sponsorship and other details.

Water For People Committee Milestone Event: Ten Years of Giving

On Saturday, August 17, 2013, a large group of committed individuals convened at the Water For People Southern Arizona Golf Classic to celebrate “Ten Years of Giving” in support of clean water and adequate sanitation in the developing world. This annual event at the Omni Tucson National Golf Resort continues to be “feel good” fun for participants as well as a successful fundraiser that supports the vital work of Water For People. Thank you to the tournament sponsors and golfers who helped raise more than $30,000 this year, to add to the more than $260,000 over the ten years since the inaugural event.

Tournament Chair Jeff Biggs and his 2013 volunteers all deserve a hearty “Thank You” for their continued support and selfless dedication to Water For People. Jeff’s team includes Brian Biggs, Katie Biggs, Taryn Biggs, Tiffany Biggs, Teresa Biggs, Peter Chipello, Laura Macklin, Harold Maxwell, Corin Marron and Gabe McGowan. See photographs of the event, slides from Mark Taylor’s luncheon presentation on World Water Corps, and our Thank You to sponsors on page 67.

Visit arizonawaterforpeople.org for additional photos... and, mark your calendars for next year’s event: Saturday, August 23, 2014.

Up Off the Sofa for Upcoming Water For People Events!

The Water For People Committee has two upcoming events to round out another impressive year for Water For People fundraising in Arizona.

The 9th Annual Water For People Hike-a-Thon is Saturday November 2, 2013 at Phoenix South Mountain Park. Sponsorship opportunities are available and it is never too early to assemble your team and register. The event will include the popular team challenge. How much water can your team carry to the summit? See the flyers on pages 46-47. Contact Tasha Lewis at CH2M Hill for more information.

You can Pedal with Purpose at El Tour de Tucson on Saturday, November 23, 2013. This event has grown to become one of the Arizona Water For People Committee most important event. A variety of sponsorship opportunities is also available for this popular bike ride. All participants must register online. See the flyers on pages 59-61. Check out the options at the Tour de Tucson. Whether you are a casual biker, a family with small children, there is a place for you to participate and support Water For People. Contact Corin Marron at Arcadis for more information.

continued on page 45
Work is nearing completion on the North Indian Bend Wash (NIBW) Groundwater Treatment Facility (NGTF) in Scottsdale. The facility is a public-private partnership between Scottsdale’s Water Resources Division and the NIBW Participating Companies (which include Motorola Solutions, Siemens and GlaxoSmithKline) to continue groundwater cleanup on the NIBW federal Superfund site.

For the last several years, Scottsdale and the NIBW Participating Companies have worked with stakeholders to determine the best use of a Salt River Project (SRP) well designated as PCX-1 that would benefit Scottsdale and its residents and support groundwater sustainability.

The new facility, located near Cattletrack (Miller Road) and McDonald Drive, will use liquid Granular Activated Carbon (GAC) to remove Trichloroethylene (TCE) from well PCX-1. The facility has a lead-lag configuration with two duty trains running in parallel and one train in stand-by. The treated water will be delivered to Scottsdale’s Chaparral Water Treatment Plant (CWTP) located approximately one mile to the east. The facility will demonstrate removal of TCE to less than 0.5 parts per billion (ppb) at the Compliance Point before treated water is delivered to the city. The treated water can also be distributed into the Arizona Canal if necessary under a new AZPDES permit.

The plan was approved by the EPA in September 2011 and by Scottsdale City Council in May 2012.

**Plan Details**

Details of the plan include the NIBW Participating Companies building a new water treatment facility on land owned by Motorola Solutions and delivering the water to the CWTP. The NGTF will be owned by Motorola Solutions and operated by the city of Scottsdale Water Resources staff and will be included in the city’s Public Water System permit inventory.

The NIBW Participating Companies are also building a pipeline connecting the NGTF to the clear well at the CWTP and the water, approximately 3 million gallons per day (MGD), will be used as part of the Scottsdale’s allocation of SRP water. The NIBW Participating Companies financed the cost of the pipeline but ownership will be transferred to the city once it starts receiving water from the new facility. Scottsdale was not responsible for any costs related to the design or construction of the NGTF or the pipeline but was involved in the design process for both components.

With the addition of well PCX-1 to Scottsdale’s groundwater portfolio, and to offset the pumping of well PCX-1 thereby continuing to achieve safe yield, other wells within the Superfund area will have reduced pumping. Successful cleanup efforts for the Superfund site have allowed TCE concentrations to migrate away from wells that are currently pumped and treated at Scottsdale’s Central Groundwater Treatment Facility (CGTF) and toward other wells tied into treatment. The regulatory agencies agree that the goal is to continue clean-up and maintain capture of the plume, and that can be achieved with strategic well pumping. In Feb. 2012, the EPA granted Scottsdale permission to reduce the use of certain CGTF wells and only pump them as needed to meet customer demand. Scottsdale and SRP also agreed to add well PCX-1 to the city’s list of direct well connections in the Water Delivery and Users Agreement.

As part of the regulatory process, Scottsdale provided a copy of the agreement between the city and Motorola Solutions to Maricopa County to acknowledge that it establishes Scottsdale’s control to treat and convey potable water as part of the city’s Public Water System permit. The city and the NIBW Participating Companies will continue to work closely with the county as the project nears completion. The EPA and ADEQ agreed that no additional superfund regulatory requirements will be placed on the CWTP.

**Construction Information**

Scottsdale and the NIBW Participating Companies worked together to develop a three step schedule that could be easily implemented and have the least amount of impacts to residents and traffic flow.

The first phase of construction was to install a water line from the clear well at the CWTP to the west side of Hayden Road. The preferred alignment required going through a portion of Scottsdale’s Xeriscape Garden and through the middle of the largest and most popular dog park in the city. To reduce the impacts to the dog park patrons, this work was performed during the summer of 2012 when activity is lowest.

While the first phase was under construction, Water Resources and the NIBW Participating Companies worked closely to complete all the
necessary permits required to begin building the actual treatment facility. This second phase of the project began in the Fall of 2012 and was completed earlier this summer.

The third and final phase of the project was to install a water line connecting the facility to the pipe already in place on the west side of Hayden Road. This step in the process should be completed by the end of October 2013.

Project Benefits

There are numerous benefits to this agreement including plume management, long term groundwater sustainability, water quality and some operational cost savings to Scottsdale.

**Plume Management** – Well PCX-1 is a critical well in the containment of the NIBW plume. The agreement allows for continuous use of well PCX-1 while putting the water to local, beneficial use.

**Groundwater Sustainability** – The agreement positively impacts groundwater sustainability within Scottsdale’s city limits. Once treated water from well PCX-1 is brought into the city’s system, it will offset groundwater pumping by minimizing the use of other NIBW wells.

**Water Quality Compliance** – The agreement also addresses water quality issues since the water from well PCX-1 will be treated through GAC prior to it being delivered to the CWTP where it will be blended with other water before being placed in the city’s distribution system. The blending will help reduce Disinfection Byproducts (DBPs) in the distribution system and the water leaving the CWTP will continue to meet or surpass all federal, state and local requirements at the Entrance Point to the Distribution System.

**Cost Reductions** – Overall expenses for well pumping will be reduced for the city since pumping of well PCX-1 will be shared with SRP. The use of well PCX-1 may also help avoid or defer the replacement of another NIBW well that is owned and operated by the city. Finally, the use of GAC at the CWTP will be reduced once the well water is part of Scottsdale’s water distribution system. The blending of the water will reduce DBPs.

Current Status

Ongoing testing of the new facility to ensure the potable water is meeting and surpassing all drinking water standards is currently under way. The facility is undergoing the commissioning process during which time it is being closely monitored. Any issues that arise will be addressed cooperatively between the Scottsdale and the NIBW Participating Companies. During the commissioning phase, the treated water is being distributed into the Arizona Canal. Once commissioning is complete, Scottsdale will complete the Approval of Construction process with Maricopa County for the NGTF and the associated pipeline. Once all approvals are received Scottsdale will begin receiving the water at the CWTP, which is expected to commence this fall.
WIFA Announces $3 Million Loan Closing for Pinewood Sanitary District

The Pinewood Sanitary District will soon extend sewer service to unsewered areas of Munds Park. The Water Infrastructure Finance Authority (WIFA) of Arizona announced that they have closed a $3 million loan with the Pinewood Sanitary District to connect the unsewered areas of the east and west commercial areas, North Lodge Subdivision, and Northern-Aire Subdivision of Munds Park to the Blackman Wastewater Treatment Plant.

The Pinewood Sanitary District has plans to eventually service all areas of Munds Park not already serviced by centralized sewer. The $3 million WIFA loan gets the District one step closer to making their plan a reality.

Experts agree that sewering the area will provide watershed protection and water quality improvements to Oak Creek, which is impaired due to exceedances of Escherichia coli (E.coli). The Arizona Department of Environmental Quality (ADEQ) completed a Total Maximum Daily Load (TMDL) in 2010 for Oak Creek and identified septic systems in the watershed as one of the potential sources of contamination to the creek.

Connecting homes and businesses currently served by septic systems in Munds Park will further the implementation of the TMDL and protect Oak Creek,” said WIFA Executive Director, Sandy Sutton. "In Bisbee’s case, we were able to offset the project costs with $400,000 in forgivable principal after evaluating the financial impact of the loan along with the benefits this project brings to the community,” said WIFA Executive Director, Sandy Sutton. This additional financial assistance gave Bisbee the opportunity to move forward with these energy efficiency improvements and increase the cost-effectiveness of the treatment plant.

"By using energy more efficiently, we can conserve resources and preserve Arizona’s energy and water supplies for future generations,” said WIFA Board Chairman Henry Darwin, who is also Director of the Arizona Department of Environmental Quality.

Through low-interest loans, subsidies and grants, WIFA is able to save its customers a significant amount of money. WIFA offers funding for drinking water, wastewater and stormwater projects designed to ensure safe, reliable drinking water and proper wastewater treatment. Since its inception in 1992, WIFA has invested over $2 billion in Arizona’s communities.

For more information, please visit WIFA’s website at azwifa.gov.

WIFA Announces $1.6 Million Loan Closing for City of Bisbee

The City of Bisbee is going solar and becoming more energy efficient. To mitigate increasing energy costs, the City of Bisbee obtained a $1.6 million loan from the Water Infrastructure Finance Authority (WIFA) of Arizona to pay for the installation of a 400 kW solar system to power their San Jose Wastewater Treatment Plant.

The solar array will generate nearly 680,000 kilowatt hours of electricity per year, or 60% of the plant’s electric requirements. Bisbee will install fixed mounted photovoltaic solar panels. Once installed, Bisbee estimates they will save $50,000 per year in energy costs and $1 million over the next 20 years.

Using a renewable energy source like solar power is beneficial to the environment and the pocket book. But, saving energy also means saving water and that’s particularly meaningful in an arid state like Arizona. With solar photovoltaic panels, virtually no water is used when generating electricity.

WIFA is dedicated to guiding its resources to communities with the greatest need. “In Bisbee’s case, we were able to offset the project costs with $400,000 in forgivable principal after evaluating the financial impact of the loan along with the benefits this project brings to the community,” said WIFA Executive Director, Sandy Sutton. This additional financial assistance gave Bisbee the opportunity to move forward with these energy efficiency improvements and increase the cost-effectiveness of the treatment plant.

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For more information, please visit WIFA’s website at azwifa.gov.

Water Infrastructure Finance Authority of Arizona
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PUTTING WORKFORCE STRATEGIES TO “WORK” IN MARICOPA COUNTY

Mark HAINES, Estrella Mountain Community College

More than half of the nation’s states are today exploring or implementing sector strategies, making this model the most consistently adopted approach to meeting businesses’ need for skilled workers and workers’ need for good jobs. Sector strategies are among the few workforce interventions that statistical evidence shows provide improvement in employment opportunities for workers and increased wages once on the job.

Employers report increased productivity, reduced customer complaints, and a decline in staff turnover, all of which reduce costs and improve the competitiveness of their companies. This is why an estimated 1,000 sector partnerships are operating across the country. Sector strategies are partnerships with employers and government, education, economic development, labor, community organizations and other stakeholders. They focus on the workforce needs of an industry within a regional labor market. At the state level, they are policies and investments that support the development of local sector partnerships. They are welcomed by governors, who are increasingly focused on the needs of critical industries and workers. Amid the challenges of a slowly recovering national economy, sector strategies can address current skill gaps and forecast new ones. Sector strategies also provide a means to engage directly with industry across traditional boundaries and better align state programs and resources serving employers and workers.

The demand for balancing budgets at the state level can threaten initiatives in education, training, economic development, and other essential state services. Sector strategies help to reduce inefficiencies and streamline state efforts by coordinating various programs and braiding disparate funding streams intended for the same purpose.

Arizona embeds strategies

Over the past two years, Arizona’s Sector Strategy Initiative has been led by the newly formed Governor’s Council on Workforce Policy, housed in the Arizona Commerce Authority. Like other states, this council focuses on training local areas on the sector partnership approach. Unlike other states, Arizona did not have funds to provide start-up grants to local partnerships. Finding funding is an ongoing goal, but in the meantime Arizona is embedding sector strategies into plans, grants, and guidance across the board, including state workforce plans, guidance for local area workforce programs, as well as apprenticeship and career pathway programs. Sector strategies are involved in a recent joint application by the Commerce Authority and Department of Economic Security to the U.S. Department of Labor Workforce Innovation Fund.

Arizona has also purchased access to real-time vacancy rates data on behalf of local areas, and plans to integrate training on this data with training on sector strategies. Arizona created a Sector Strategy Committee as part of their Governor’s Council on Workforce Policy that includes leadership from their Departments of Education, Economic Security and Commerce.

They have created an additional group called Friends of Sector Strategies made up of over 65 representatives (and growing) from industry associations, community organizations, local workforce boards, economic development agencies, tribes, and others. The outgrowth of this effort has been accurately identifying specific regional area labor deficiencies.

Maricopa County implements strategies

Using this data, in the Phoenix-Maricopa County region, Maricopa Workforce Connections has targeted several industry clusters as “in demand” occupations:

• Advanced Manufacturing (including Aerospace and Defense)
• Biosciences
• Green Technologies
• Healthcare
• Information Technology (including Advanced Communications)
• Solar (including Manufacturing and Construction)
• Transportation, Warehousing and Logistics.

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“Representing quality equipment for the treatment of water and wastewater”
One outcome of this collaborative effort is a need identified by McClendon for specific employee training opportunities imbedded within the industrial skill programs offered at EMCC. Specifically, several training areas were identified including industrial safety, hydraulics and pneumatics, technical math, math of electronics and several electrical/electronic courses, all of which are offered through the college’s industrial programs.

**College partnership responds with solutions**

The SouthWest Skill Center at EMCC, one of the ten Maricopa Community Colleges, has studied the results of Arizona targeted industry sectors as compiled by Maricopa Community Colleges Workforce Development Department and has focused on program development based around identified “in demand” occupations. As a result, EMCC responded by developing programs in these areas.

“According to our strategic industry partners, they identified training needs in Industrial Electronics Technology, Distribution Logistics and Precision Manufacturing,” said Tom Cotner, Director of the Skill Center at EMCC. “These in-demand programs are where we see the future of niche-skilled education and training.”

Mark Haines, the Industrial Skills Program Manager at EMCC, has also been working on this concept and responded to Niagara Bottling need of specific employee training opportunities by developing single course training modules for employers to develop their current workforce.

The sector training program was refined and the first group of Niagara Bottling employees started an evening course in “Math for Electronics” in mid-September 2013. According to Haines, the training opportunities that will be afforded to industry, both public and private, regarding this new program are enormous.

“The ability for single course student enrollment within an industrial skill based program will provide highly specialized, specific, short-term training in a wide variety of industrial skill areas,” said Haines. “These areas include maintenance skills related to pumps, motors, chemical feed injection systems and more.”

Coming from the water/wastewater industry as an operator, Haines foresees an enormous potential benefit to water/wastewater treatment system operators, in terms of both refresher and advanced mechanical and electrical training for employees. In Haines’ view, advanced sector strategies will increasingly create career pathway systems to meet most industry’s workforce needs, and is an efficient way to train specialized workers. For workers, sector strategies will establish clear paths to good jobs and careers.

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4. L. Woolsey, State Sector Strategies Coming of age, Implications for State Workforce Policymakers, Jan 2013
Surface Water / Ground Water Sampling and Analysis Workshop

Date: November 19-21, 2013
Location: Arizona Department of Health Services
         State Laboratory
         250 N. 17th Avenue
         Phoenix, AZ

Offered by: AZ Water Association, Arizona Department of Environmental Quality, and Arizona Department of Health Services

Up to 21 PDHs will be offered for completion of the workshop. Partial PDHs may be given. In the event of unforeseen circumstances, agenda items and total number of PDHs offered may change without notice.

Environmental samples collected for monitoring and compliance purposes must be collected using defined protocols to obtain reliable and defensible data of known quality.

This workshop is designed to give an overview of sample project planning, and the collection and analysis of surface water and ground water samples for research and regulatory compliance purposes. It is recommended for environmental samplers, consultants, engineers, laboratory technicians and analysts, laboratory directors, inspectors and water system operators.

Topics Include:
Laboratory Quality Assurance
Evaluating a laboratory for environmental analysis
Tour of the Arizona Department of Health Services Laboratory
Sample Plan development
Ground water sample collection techniques
Surface water sample collection techniques
AZPDES monitoring requirements
Safety in sampling and sample handling
Legal (evidentiary) requirements of environmental samples and chain of custody
Field Demonstration - Ground Water and Drinking Water Sampling Techniques
Field Demonstration - Surface Water and Biomonitoring Sampling Techniques
Interpretation of laboratory data
Working with your laboratory to obtain the data quality you require
Drinking Water Rules
The necessity of Standard Operating Procedures
Aquifer Protection Permit monitoring requirements
How Water Quality Standards drive monitoring
Biomonitoring as a regulatory tool
Use of proper documentation throughout the project

Registration fee: $200.00 includes lectures and printed materials.

There will be NO on-site registration.

Class size is limited to 45.

Registration

Online at: www.azwater.org
Credit Card Payment (MasterCard, VISA, American Express accepted)
Check (made payable to AZ Water Association)
NOVEMBER 19-21, 2013
SURFACE WATER/GROUND WATER SAMPLING AND ANALYSIS WORKSHOP

REGISTRATION FORM

(Please type or Print)

(Dr., Mr., Ms.) ____________________________
(First) (M.I.) (Last)

Employer’s Name: ______________________________________________________

Position Title: __________________________________________________________

Employer’s Address: _____________________________________________________

City: ___________________________ State: ____________________ Zip: ____________

Phone Number: (____) ______________ Fax Number: (____) ________________

E-mail Address __________________________________________________________

Check enclosed ________________ Check to be mailed ________________

Credit Card Payment: VISA MasterCard American Express

Credit Card Number __________________________________________ Exp: ________

Cardholder _____________________________________________________________

Signature __________________________________________________________________

Email Receipt to: __________________________________________________________________

Registration fee: $200.00

Make checks payable to: AZ Water

Mail checks to: AZ Water Association
1042 Willow Creek Road
A101-510
Prescott, AZ 86301
WATER TREATMENT GRADES 1 AND 2

1. What is the primary treatment process that is present in a conventional water treatment plant but absent in a direct filtration water treatment plant?
   A. Coagulation
   B. Disinfection
   C. Sedimentation
   D. Filtration

2. What is the feed rate on a rotometer in pounds per day (ppd) when feeding gaseous chlorine at a dose of 3.6 milligrams per liter (mg/L) to a flow of 1.8 Million Gallons per Day (MGD)?
   A. 10 ppd
   B. 18 ppd
   C. 36 ppd
   D. 54 ppd

3. How many pounds of aluminum sulfate (alum) are used from a day tank that is 3 feet in diameter and 6 feet tall if the starting level is 66 inches, 200 gallons are added during the day and the ending level is 30 inches. Presume the alum weighs 5.36 pounds per gallon.
   A. 1000 lbs
   B. 1920 lbs
   C. 3600 lbs
   D. 6600 lbs

4. What is the maximum contaminant level in milligrams per liter (mg/L) for chloramines exiting a conventional water treatment plant?
   A. 0.5 mg/L
   B. 2.0 mg/L
   C. 4.0 mg/L
   D. 10 mg/L

5. Which of the following would normally be worn while handling 150-pound cylinders of chlorine in a truck bed?
   A. Steel toed shoes
   B. Leather gloves
   C. Full-faced cartridge respirator
   D. All the above

WATER TREATMENT GRADES 3 AND 4

2. What happens to the pH of water as it is softened with lime?
   A. It decreases.
   B. It stays the same.
   C. It increases.

3. How many gallons of 23% Hydrofluorosilicic Acid (HFS) are needed to increase the fluoride residual from 0.3 mg/L to 1.0 mg/L when treating 35 MGD of surface water? Presume there are 1.93 pounds of fluoride per gallon of HFS.
   A. 105 gals
   B. 204 gals
   C. 250 gals
   D. 700 gals

4. If 5000 gallons of sludge are pumped to a drying bed, how many cubic feet (cu/ft) does that occupy?
   A. 100 cu/ft
   B. 433 cu/ft
   C. 600 cu/ft
   D. 668 cu/ft

WATER DISTRIBUTION GRADES 1 & 2

1. How many gallons are used by a customer in one month if the initial reading on his meter is 237644 ccf and the final reading is 237716 ccf?
   A. 72 gals
   B. 105 gals
   C. 299 gals
   D. 963 gals

2. Which is preferred while repairing small leaks in water mains; Repair wet or dry?
   A. Wet
   B. Dry

WATER DISTRIBUTION GRADES 3 & 4

1. Which of the following is the best backflow device to deliver water to a small company that uses hazardous chemicals in its processes?
   A. Gate valve
   B. Check valve
   C. Reduced Pressure Principle Backflow Assembly
   D. Vacuum Relief Valve combined with Double Check Valve

2. How much will it cost each day to feed 2.4 mg/L Chlorine using 12% sodium hypochlorite to 5 wells producing a total of 4350 Gallons per Minute (GPM)? Presume there is one pound of chlorine per gallon of sodium hypochlorite and it costs $1.12 per gallon.
   A. $140 /day
   B. $260 /day
   C. $330 /day
   D. $500 /day

3. Which of the following contaminants is not an EPA DBP?
   A. Bromite
   B. Chlorate
   C. Chlorite
   D. Halo-Acetic Acids

4. A reservoir measuring 36 feet in diameter and 30 feet tall can contain how many gallons of water?
   A. 50,000 gal
   B. 125,000 gal
   C. 183,000 gal
   D. 228,000 gal
5. If it is desired to flush an 8” main at a velocity of 2.6 feet per second, how many Gallons per Minute (GPM) should a meter read where the water is discharged?
A. 100 GPM  
B. 200 GPM  
C. 300 GPM  
D. 400 GPM

WASTEWATER COLLECTION GRADES 1 & 2
1. While designing wastewater collection systems, a route survey will pinpoint the location of physical features that may influence:
A. The elevation of other underground utilities.  
B. The horizontal location of a sewer line.  
C. The location of drinking water lines.  
D. The location of future roads.

2. If a lift station pumps 350 gallons per minute (GPM) 8 times a day for 20 minutes each time, how many gallons will it have pumped by the end of the day?
A. 1,000 gals  
B. 35,000 gals  
C. 56,000 gals  
D. 80,000 gals

3. Which of the following would be considered an oxygen deficient atmosphere?
A. Greater than 23.5% oxygen.  
B. 21% oxygen.  
C. Less than 19.5% oxygen.  
D. Less than 21 ppm oxygen.

4. Wastewater collection lines are surcharged when:
A. The lines are laid on a steep grade.  
B. Wastewater flow is less than the hydraulic gradient.  
C. Intrusive roots build up in wastewater lines.  
D. The supply of water exceeds the capacity of the pipes.

5. The best way to control roots is to:
A. Apply chemicals.  
B. Install sewer lines that don’t leak.  
C. Allow grease to seal cracks.  
D. Kill all trees along the sewer line route.

WASTEWATER COLLECTION GRADES 3 & 4
1. The water velocity in a 12-inch pipeline is 6 feet per second. What is the velocity head?
A. 0.56 ft  
B. 4.7 ft  
C. 6 ft  
D. 72 ft

2. What happens when the absolute pressure at the pump inlet drops below the vapor pressure of the water being supplied?
A. Backflow  
B. Cavitation  
C. Higher discharge flow  
D. Higher discharge pressure

3. If a pump lowers a wet well that is 4 feet in diameter by 18 feet in 7.5 minutes. What is the production of the pump in Gallons per Minute (GPM)?
A. 100 GPM  
B. 180 GPM  
C. 225 GPM  
D. 334 GPM

4. What is the primary force used to convey wastewater through the sewer system?
A. Gasoline motors  
B. Pneumatic pumps  
C. Vactor trucks  
D. Gravity

5. What is the brake horsepower (bHp) of a pump that lifts water 45 feet at a rate of 365 GPM and has an efficiency of 65%?
A. 3.8 bHp  
B. 6.4 bHp  
C. 7.5 bHp  
D. 8.34 bHp

WASTEWATER TREATMENT GRADES 1 & 2
1. What is the detention time in a primary sedimentation basin measuring 80 feet long, 20 feet wide and 12 feet deep with an influent of 2.75 Million Gallons per Day (MGD)?
A. 1.25 hrs  
B. 2.20 hrs  
C. 3.65 hrs  
D. 5.60 hrs

2. How may the operation of an anaerobic digester be optimized while pumping sludge from primary clarifiers?
A. Pump sludge only at night to minimize influence of algae growth.  
B. Pump sludge through a drying bed first.  
C. Pump only thick sludge to the digester.  
D. Pump the same amount every day.

3. What is the biological surface loading rate in pounds per day per square foot (ppdpsf) to a circular clarifier 86 feet in diameter when the clarifier has an influent flow of 16.2 MGD and a BOD of 288 mg/L?
A. 1.0 ppdpsf  
B. 6.7 ppdpsf  
C. 8.8 ppdpsf  
D. 9.6 ppdpsf

4. What is the capacity in a basin that measures 40 feet long, 15 feet wide, and 15 feet deep?
A. 9,000 gals  
B. 67,320 gals  
C. 77,250 gals  
D. 98,080 gals

5. Which of the following is the flow through a grit chamber?
A. 1 ft/sec  
B. 2 ft/sec  
C. 3 ft/sec  
D. 4 ft/sec

WASTEWATER TREATMENT GRADES 3 & 4
1. Which of the following is the most accurate measure of the organisms present in an aeration basin for treatment of incoming waste?
A. Dissolved Oxygen  
B. Suspended Solids  
C. Mixed Liquor Suspended Solid  
D. Mixed Liquor Volatile Suspended Solids

2. What is the organic loading in pounds per day (ppd) to a wastewater treatment plant treating a flow of 15.0 MGD if the influent BOD is 318 mg/L?
A. 1,500 ppd  
B. 8,340 ppd  
C. 15,000 ppd  
D. 40,000 ppd

3. When considering a change to an activated sludge plant that has become upset, the first thing the operator should do is:
A. Collect additional samples to verify existing conditions.  
B. Divert influent to emergency holding tanks.  
C. Review plant data for the past 3 weeks.  
D. Call the superintendent.

4. How many pounds of solids are in an aeration basin measuring 60 feet by 30 feet containing 18 feet of activated sludge and having a suspended solids concentration of 2,200 mg/L?
A. 1,400 lbs  
B. 2,800 lbs  
C. 4,450 lbs  
D. 6,125 lbs

5. Power couplings between electric motors and pumps should be:
A. Kept in alignment  
B. Kept sealed  
C. Painted annually  
D. Mounted vertically

SEE ANSWERS ON PAGE 65
Background

With growing concerns over sustainability, municipalities and their operations staff have heightened focus on optimization of treatment processes. The City of Glendale received an Energy Efficiency and Conservation Block Grant (EECBG) from the United States Department of Energy (DOE) to implement a number of improvements across the City. The largest of the City’s energy efficiency upgrade projects is the Ultraviolet Disinfection (UV) Upgrade at the Arrowhead Ranch Water Reclamation Facility (ARWRF).

The ARWRF is located north of Union Hills Drive and west of the Loop 101 in the City of Glendale (Figure 1). The ARWRF was originally constructed in 1983 and has a rated capacity of 4.5 mgd of average annual daily flow (AADF).

The ARWRF provides total nitrogen removal with the use of anoxic and aeration zones in three activated sludge treatment trains. Following biological treatment, the plant has six rectangular final clarifiers, sand media tertiary filtration followed by UV disinfection with sodium hypochlorite for back-up.

Medium Pressure UV Disinfection Systems have been used in a number of wastewater treatment plants (WWTP) and water reclamation facilities (WRF) in the state of Arizona and nationwide. A growing trend in the last several years has been to replace medium pressure systems with a more cost efficient alternative. In several local cases the solution has been to transition to Low-Pressure High-Output (LPHO) UV systems. Previous case studies indicate that power efficiency improvements can result in significant power usage reductions.

Establishing Goals

Prior to implementing the energy efficiency upgrades at the ARWRF, the City sought to establish the primary goals associated with upgrading the UV disinfection systems. Through a competitive process, Black & Veatch was selected to provide engineering services through the preliminary design, final design, construction, start-up and commissioning phases of the project. With the City, Black & Veatch established energy reduction, reduced O&M and permit compliance as the priority project goals.

The ARWRF UV disinfection system designated for replacement was a two-stage medium pressure UV disinfection system installed in a retrofitted chlorine contact basin (Figure 2). The existing system was installed in 1998 as part of the City’s Phase III ARWRF Capacity Expansion Project. The old medium pressure UV system exhibited a number of operational issues including high energy consumption, low UV lamp life, and unreliable disinfection performance. In order to establish a benchmark for power savings, the City installed temporary power monitoring to quantify the energy costs associated with the medium pressure system. The power monitoring indicated that the City was using between 1.5M and 1.8M kWh per year for disinfection alone at a cost of $120k to $145k annually. Additionally, with heightened concerns over maintenance and reliability, the estimated O&M costs for the older UV system were substantially higher (2:1) than what more modern systems require, primarily due to the reactive nature of the issues experienced with the older technology including premature bulb/ballast failure, and failure of other electronic components.

Equipment Selection

Due to the complex nature of UV disinfection equipment and the differences in equipment configurations, the City chose to preselect and pre-purchase the UV equipment, allowing for more tailored construction documents. The selection process began with establishing the requirements for each manufacturer that align with the City’s goals. The primary criteria used included energy efficiency, treatment reliability and experience. California Department of Public Health Title 22 was used to establish which manufacturers were acceptable for the application at the ARWRF, and National Water Research Institute (NWRI) guidelines were used to establish the appropriate design criteria for the new UV system. Each manufacturer was also required to provide a guaranteed lamp life and guaranteed lamp replacement cost for the first 5 years of systems operations.

The ARWRF is an Arizona Class A+ treatment facility requiring four of every seven samples to achieve a “non-detect” result for bacteria.
Given the history of treatment related issues, the new UV system design criterion was established to provide more robust disinfection at the ARWRF. The Trojan 3000Plus UV System was selected through the pre-purchase evaluation process.

**Facility Design and Construction**
Additional considerations during the detailed design phase of the project included how best to protect the City’s new investment. The old UV system was installed outdoors, exposed to the summer heat, wind borne contaminants and other weather elements that likely led to many of the equipment reliability and disinfection quality issues that the plant experienced. To mitigate these issues, the City decided to construct a new building and new channels for the new UV system (Figure 3). MGC Contractors was selected through the bidding process and constructed the new facilities. The new building was constructed immediately south of the older disinfection system leading to a number of challenges associated with temporary pumping/piping and old and abandoned buried infrastructure. The ARWRF is an end of the line treatment facility with no means for bypass. Therefore, maintaining the plant operation was a focus of the construction sequencing and required a number of carefully planned outages used to tie the new UV system into the existing effluent discharge and electrical systems.

**Start-up and Commissioning**
The start-up phase of the ARWRF UV Upgrade included a number of initial checks, followed by a two-phase performance testing period, and 30 days of commissioning. The purpose of the two-phased approach is two-fold; 1) to confirm the system meets permit limits and record baseline power consumption data under normal operating conditions and 2) to confirm the system meets treatment and energy consumption requirements under design conditions.

The first phase of testing was conducted on consecutive 8-hour days with bacteria samples recorded every hour downstream of each operational UV bank. Flows ranged from 2.5 mgd to 3.5 mgd with the system consistently meeting “non-detect” for all samples recorded. Power monitoring during the performance test indicated that the City could achieve an energy savings of up to 2,750 kWh per day or nearly 1M kWh for the year with an annual cost savings of approximately $80k.

Phase two included a third party witnessed bio-assay test and required installation of a temporary recirculation system allowing the new UV system to operate in a closed-loop (Figure 4). In accordance with NWRI guidelines, the characteristics of the water in the building were adjusted to match the design requirements outlined in the project specifications. A virus (MS2) was injected into the flow stream with samples collected a varying time intervals depending on the flow through the channels and the requisite hydraulic retention time. The testing proved the system functions as required, both from an energy consumption perspective and log removal of the test virus. Commissioning commenced immediately following confirmation that the system met performance criteria.

**Next Steps**
The UV disinfection upgrade at the ARWRF is a major step towards improving operational efficiency. The disinfection and filtration systems are closely tied together at any treatment facility, and historically the ARWRF has experienced some issues with the effectiveness of the existing filters. Currently, the City is in the process of scoping a project that will address the issues at the filters with potential to further reduce energy consumption associated with UV disinfection.

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![Figure 3: The new LPHO UV system will greatly improve disinfection performance and energy usage](image)

![Figure 4: Closed-loop operation provides the controlled environment required for bio-assay testing](image)
SUCCESS AND FUN

By Paul HENDRICKS

FOCUS

I recently heard a talk from Paul Tsika on the topic of “FOCUS”. I trust that you will find this information useful in your daily life.

We all understand the need for focus in our life and focus to accomplish the things we desire in our future. We’ve all heard of organizations and people in sports and other professions who have accomplished great things at one time, but have now lost their focus and are no longer achieving or performing at the level they once did. Of course there are many reasons for no longer performing at the same level, but today we want to consider one of the main things that each of us can do to restore or improve our circumstances and performance. FOCUS is something we all have significant control over. Even in today’s busy life with all the self made and imposed distractions, each of us can improve our FOCUS.

Remember that we all have the same amount of time each day and we have only one life to live. It is our responsibility to make intentional choices in our life. If we do not make choices with a purpose we will be consumed by the purposes of other agendas. The greatest among us focus on process and progress rather than perfection or the end goal. A worthwhile goal is never met if you do not focus and engage in the process of making progress toward that goal. There are two major barriers to success, Procrastination and Perfection. Those that delay and those that will not engage until things are perfect. So do not delay and do not wait until things are perfect. START TODAY!

If you are a person seeking maximum joy in your life you should start by reducing the distraction in your life, while increasing the focus in your life. The most important focus in your life is focusing on your future and not on your past. This is because are life is in our future. Like a set of expensive binoculars which are focused properly, our life is most valuable when focused. This same set of expensive binoculars has no value without proper focus. It is been said that the human being has an unlimited capacity to do absolutely nothing with their life. An unfocused life feels like that.

Without Focus we may have some of these areas blurred in our lives.

Without Focus We:
1. Replace destiny with strong misconceptions of destiny
2. Replace faith with fear
3. Become overwhelmed by problems rather than remain open to the provisions available to solve problems
4. Put more emphasis on obstacles rather than opportunities
5. Embrace a victim’s mentality
6. Are caused to talk negatively and act cowardly
7. Determine how much we receive verses how much we achieve
8. Misrepresent our life purpose.

Most successful people have a coach or a mentor that can help them deal with finding or maintaining their life focus. One of the blessings I’ve had in my life is my wife Elaine. Believe me if I lose focus or become blurred in my thinking, she helps me refocus. She and I have been happily married for over 43 years. During that time she has learned how to effectively help me understand when I have lost focus. To make the most of any focused endeavor you must understand the following:

1. Life is a Trade Off - You will trade off your time, your effort, your emotions, your money, your energy, and your resources. If you want to accomplish something great and maintain your focus, you will have to trade things like taking the evening or weekend off to watch TV versus applying yourself in your area of focus that will lead to your life goal. A focused person does not settle for less than best. So trade up rather than just trade off. Trading up is choosing things that align with your Major Life Purpose. Success in life is more about our willingness to change than it is about our talent or abilities. So many are "Just Enough People", doing just enough to get by or to get to the end of the week. A Focused person is not a "Just Enough" person.

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2. **Association is Everything** - A focused person must seek to be insulated from negative voices and inputs. It has been said that, "You cannot drive a dump truck of correction over a cardboard bridge of relationships". A successful person is focused on building relationships with like-minded and focused associations and friendships. Seek out a coach and mentor that will help you stay focused on your life purpose. Seek out positive people that have an outlook that is uplifting. Critics and negative people are not normally seeking personal growth and development.

3. **Talk without Walk is Dead Talk** - Simply saying "it" is not enough to make "it". You cannot remain focused and accomplish your life purpose without action that is focused on the process and progressive realization of your goals and dreams. You must see yourself as a worthy person and your work must match your talk. A focused person has alignment in their talk and walk. The more you believe the more you achieve. The more you complain the less you obtain. Negativity is a communicable disease and the only way to avoid it is to avoid negative talk and negative relationships.

I close with a quote from the great Chief Tecumseh from many years ago, *"Live your life that the fear of death can never enter your heart. Love your life, perfect your life, and seek to make your life long and its purpose in the service of people important. When you rise in the morning give thanks for the food and the joy of living, and if you see no reason for giving thanks, the fault lies only in yourself. Abuse no one and nothing, for abuse turns the wise person into a fool and robs the spirit of its vision. When it comes time to die, be not like those whose hearts are filled with the fear of death so that when their time comes, they weep and pray for a little more time to live their lives over again in a different way. Sing your death song and die like a hero going home."*

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 phenricks@cox.net if I can be of assistance to you.
As we move past the economic downturn, one of the challenges emerging for the Arizona water/wastewater industry is ensuring a sufficient supply of capable treatment facility and system operators who can advance through their careers to higher levels of capability and responsibility. The past several years have been marked by staff cuts and hiring freezes at many utilities, but more “normal” conditions are returning, growth is resuming, and issues that were deferred during the downturn must now be addressed. The need for capable operators is as great as ever and will only increase in the future.

Passing the certification examinations administered by the Arizona Department of Environmental Quality (ADEQ) is a key requirement for operators to move up to higher levels of responsibility. However, the success rates for operators taking ADEQ certification exams have declined from past years and are disturbingly low. In fiscal year 2012, 490 wastewater treatment operator certification exams were given in Arizona, and the overall passing rate was just 41%. The passing rate in Arizona for the Grade 4 wastewater treatment examination was only 13%; a mere 6 persons passed that exam during the entire year.

As a comparison, in California the overall passing rate for wastewater treatment operator examinations was 58%, a 40% higher success rate than in Arizona. The success rate in the various grades in California ranged from 49% on the top-level examination to 66% on the entry-level examination.

Half a dozen new grade 4 operators per year will not be sufficient to meet the needs of the 100+ wastewater treatment plants in Arizona. Similar issues exist with respect to the Arizona wastewater collection exams and the water distribution and water treatment certification exams as well. This is a compelling problem that needs to be addressed.

The baby boom generation is reaching retirement age and many of the senior operators in the state have left or will soon be leaving the profession. Reduced hiring practices over the past several years have depleted the numbers of personnel entering the industry who might have developed into replacements for retiring senior personnel. In addition, personnel who encounter trouble in passing the exams, particularly on repeated attempts, can see their careers stall out and some leave the industry to seek other opportunities.

Providing services and programs to meet the needs of treatment plant operators is a key goal of AZ Water’s Wastewater Treatment Committee, and the committee has undertaken an initiative to help our state’s operators improve their success rate on the certification exams.

Background
The Arizona Department of Environmental Quality (ADEQ) has the regulatory authority to certify operators of water and wastewater systems in Arizona. In the past, Arizona used a locally-developed test for its operator certification examinations. Most states use standard national examinations developed by the Association of Boards of Certification (ABC). Questions arose as to whether the Arizona examinations were sufficiently rigorous in their content and administration. Operators relocating from Arizona to other states often were not given reciprocity on their certification in the new state. Arizona converted to using the standard examinations provided by ABC. Since that change occurred, ADEQ reports that the passing rate on the wastewater treatment operator exams has declined significantly. This gives rise to a number of concerns including the potential for a shortage of appropriately-certified operators, and loss of operators from the profession if they cannot advance in their careers. Some have questioned whether the ABC test is fair or reflective of Arizona wastewater issues.

Certification Exam Procedures
Arizona is now one of over 40 states that use the operator certification exams provided by ABC. ADEQ contracts with Gateway Community College (GCC) to administer the registration process and proctor the exams. Four or five exam sessions are offered in Phoenix each month and another four or five in various locations throughout the rest of the state. Each exam consists of 100 questions; 70% is the passing score. Persons taking the exam can get their results the same day.

The exam fee is $87 or $107, depending upon whether a GCC site or an off-site location is used for the test. About half the exam fee goes to ABC and half to GCC for administering the testing program. The ADEQ Operator Certification webpage [http://www.azdeq.gov/environ/water/dw/opcert.html] provides links to ABC [http://www.abccert.org/testing_services/need_to_know_criteria.asp] and GCC [https://sites.google.com/a/maricopa.edu/adeq-operator-certification/home] for those seeking information about the exams and testing program.

Possible Causes of Decline in Test Results
Over the past several months, AZ Water’s Wastewater Committee members, operators, and ADEQ personnel have discussed in detail possible causes for the low passage rate on the examinations. One of the original concerns raised was that the ABC examinations include subject matter that is not applicable to Arizona and that operators are not familiar with. This was discussed early by the Wastewater Treatment Committee and has been discounted as a concern. While there may be wastewater treatment processes that are not common in Arizona, Arizona’s diverse geography, climate, options for disposal and reuse, and other factors have opened it to a wide variety of existing and potential unit treatment processes. In addition, having an exam that covers the full range of wastewater treatment technologies is necessary for the test be supportive with respect to reciprocity with other states.

On the basis of these discussions, the following potential causes were identified as contributing to this problem:
1. Some personnel have difficulty navigating the registration process. When the committee offered a webinar featuring Noah Adams of ADEQ to explain the certification examination process, there was a large turnout, many questions, and much discussion. In general, this can be interpreted to mean that although registration information can be accessed through the ADEQ website, there are many personnel who are not familiar with the process.

2. The ABC examinations are more rigorous than the state-developed exams used in the past. ADEQ personnel who have administered the current ABC exams and the previous state-developed exam believe that the ABC exams are in fact more challenging. In addition, the exams are administered with more rigorous conditions than has been reported for some past examinations (i.e., no “hints,” etc.).

3. “Operator math” problems appear to be the most challenging examination subject matter. This appears to be the single most critical factor in the high rate of failure. This conclusion is based on analysis of exam results by ADEQ as well as the experience of committee members offering tutoring to prepare individuals for the exam. Committee members were unanimous in recommending that measures need to be instituted to address this need.

4. Operators need to work harder to prepare for the tests. Because the examinations are more challenging, a greater level of effort to prepare for the exams is necessary and operators accustomed to the past exams may not be ready for the demands of the new tests.

5. Resources are available to help prepare for the exams, but operators need assistance in accessing them. Numerous resources are available to help operators prepare for certification exams, but they are scattered—offered by a variety of entities and probably not fully known to many of those preparing for the exam.

**Operator certification webinar.** This past spring, the Wastewater Treatment Committee sponsored a webinar featuring Noah Adams of ADEQ, who made a presentation on the operator certification program works and how the certification examination process works. This webinar will likely be offered again in the future.

**Operator’s math workshops.** Since mathematics problems are one of the most challenging aspects of the exams for many operators, the Wastewater Treatment Committee offers an “operator’s math” workshop focusing on the issues that many operators have with that portion of the certification exams. Several of these workshops have been presented by committee members Doug Berschauer, Gary Whitten, and Jesse Black, and they have been very well-received. The committee intends to continue offering these sessions; if you are interested please contact committee chair Doug Kobrick [doug.kobrick@atkinsglobal.com].

**Certification Corner.** This and every issue of Kachina News includes a certification corner (called The Pipeline) with practice examination questions. The committee is planning to compile the questions from past issues into a resource that will be posted on the committee’s webpage.

**ADEQ resources.** In addition to the information provided on its webpage, ADEQ offers training sessions around the state throughout the year, covering various aspects of operator certification [http://www.azdeq.gov/environment/water/dw/other.html]. Dean Moulis [Moulis.Dean@azdeq.gov] of the Wastewater Treatment Committee, and based in ADEQ’s Tucson office, has offered to allow interested persons to visit his office and take a practice exam and offer them feedback in preparation for the exam. The ADEQ website also includes links to AWWA, WEF and ABC resources for preparation for certification exams.

**AZ Water resources.** AZ Water offers a number of other resources to assist operators in advancing their careers, including preparation for certification exams. There is an entire series of operator training tracks offered at the annual conference, and the annual Tri-State Seminar is focused on operator training. The Wastewater Treatment Committee is building a list of operator certification resources that will be posted on its webpage.

**Free on-line accessible training manual.** Ragsdale Associates LLC offers training courses on a variety of operations issues throughout the Southwest. Although there is a fee for the training courses, they have made their training manual available on-line free of charge at the following link: http://www.ragsdaleandassociates.com/WastewaterStudy.htm.

**Cal State Sacramento training class.** California State University Sacramento has developed an on-line certification exam training course that is well-regarded. The cost of the course is $99; it can be accessed at http://www.owp.csus.edu/courses/wastewater/operation-of-wastewater-treatment-plants-vol-i.php. They also offer other treatment-related courses at http://www.owp.csus.edu/courses/online-courses/wastewater-treatment.php.

**Other resources.** The State of Tennessee has compiled a list of training courses that it has screened and approved for operator training, which might be a source for other possible training opportunities of interest. This list can be accessed at http://www.tn.gov/environment/water/docs/fleming/approvedce_ongoing.pdf.

**Ongoing Efforts**

The Wastewater Treatment Committee believes that the best areas to be of service with respect to this issue are in improving the availability and accessibility of the training available to the persons taking the exams. The new examinations are here to stay and the goal is to assist operators in building their capabilities and knowledge base so that they can succeed on the examinations and in their careers. In the coming months the committee will continue to offer training sessions and expanding its resource base of information to assist our state’s operators in advancing their careers and meeting the needs of Arizona’s wastewater treatment facilities.
LEADERSHIP

By Fred KRIESS, Severn Trent Environmental Services

KEEPING YOUR CAREER ON TRACK / PERSPECTIVE IS THE KEY

Over the past couple of months, I’ve had some reminders about how important it is to really keep events, circumstances, happenings and whatever life throws at us all into perspective. A key challenge of becoming an effective leader is to develop the ability to “weather the storm” while stepping up and meeting what at times are difficult and what seems like insurmountable challenges. Our industry is one where we deal with emergencies which generally occur when least expected. When I first broke into our industry, I had someone tell me that main breaks or sewer line stoppages occur on holidays and sure enough he was right more often than not!

One of the key attributes of becoming a successful leader is to avoid becoming overly emotional and “Caught up in emotions of the moment.” I think back to the great leaders that I have observed (and worked with) and the one characteristic that stands out to me is their ability to project an air of calmness and controlled demeanor. They also have the ability to stay in the moment and retain their focus. One that comes to mind is Rudy Giuliani and how effectively he led his city through the difficult events of September 11, 2001. Stated simply, effective leadership is learning to control emotions during a crisis and times of high stress.

Now, I would be the first to admit that this is far easier said than done and it is something which I have to constantly work on. Our teams and people are looking for leadership and watching us. Our ability to guide and steer them during tough and difficult circumstances is one of the most important responsibilities that we carry. I also would suggest that calm and confident leadership will ensure that those whom we are privileged to lead will remain safe on the job and won’t get injured due to excessive stress.

I always ask myself – How important is this issue, whatever it is, going to be a year from now? Is it really worth stressing over? There is an old saying that “Stress isn’t worth dying for.”

There are certainly times where we must take immediate and decisive action to deal with a crisis. However, most of the time, when presented with a challenge or situation, we do have the luxury of some time to evaluate the challenge and determine the best way to respond. One of the mistakes which can be made is the temptation to immediately and quickly respond so that we get the thing off of our plate and can move on to something else.

A Decision that is made quickly and based on Emotions is rarely the best decision.

Don’t make a permanent decision on temporary feelings.

Here is an example that illustrates the dangers of an immediate response where it wasn’t necessary. Several years ago and late on a Friday afternoon, I received an email from a corporate Vice President who was himself reacting to a customer complaint that had been received and the tenor of his words came across as accusatory and making some blind unfounded statements. His words were based on his perspective and view of the situation from several thousand miles away (our corporate offices were in the northeast).

I read the email and found myself getting hot and irritated. I then wrote out a three page response (which was full of emotion) and sent it out at about 6 p.m. on a Friday evening (which would have been 9 p.m. Eastern time).

During the weekend, I reflected on what I had written and by Monday morning (when my emotions had calmed down), my response would have been far different and not have been written out of emotion. In any event, what was the reason to send an email out late on a Friday night? Would it have made any difference and who was going to be reading it? I certainly had time to review the situation and should have taken full advantage of that time. This was something which could have derailed my career. Fortunately, I called the Vice President on Monday and worked things out on the phone.

The lesson learned for me, was that if I have time to evaluate a situation and make a decision, it is best to use the time. It allows time to consult with team members, peers and then formulate the best and most appropriate response while keeping everything in perspective.

Another thing that I have learned to avoid over reacting to bad news, for things are seldom what they first seem.

More Thoughts On Perspective

I was making my first trip in a new vehicle with only a couple of hundred miles on it, when a small chip flew up off the freeway resulting in a large chip on my windshield. I have to say I felt an immediate flush of anger and build-up of stress. Shortly thereafter, I was relaying the story to my son, Matt, who gently reminded me that “Things could have been so much worse Dad,” and he was absolutely right on the mark. I wasn’t in an accident or injured and cars can be fixed. On the other hand, it’s not always easy to fix a broken body.

I travel frequently on business and as such stay in many hotels. Recently, I checked into a hotel and when I got to my room, the room didn’t feel cool. I tried to adjust the thermostat but the room still didn’t cool down. I checked with the front desk and the hotel desk employee’s response was to send up a floor fan. Again, I felt that twinge of irritation until I stepped back and realized that my accommodations were so much better than the majority of the world. After all, I had a clean room and a roof over my head.

These two situations helped me again realize how important it is to keep things in their proper perspective and focus on the positives rather than the negatives.