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As a nation the United States devotes nearly four percent of electrical energy generation to lift, move, pressurize, distribute, and treat water. Federal estimates state that water treatment facilities use an average of 2 kWh/kgal while wastewater facilities use an average of 3 kWh/kgal. Inefficient facilities can use much more energy. A study completed in 2009 found that a wastewater treatment facility in northern Arizona was using 8.5 kWh/kgal. While not all facilities are inefficient it should be noted that throughout Arizona there are more than 366 water treatment and 776 wastewater facilities. Each of these systems is unique in its design and its energy footprint.

Communities throughout Arizona and the Nation face daily struggles in maintaining water and wastewater facilities and infrastructure, training of staff, energy management and funding. The Governor’s Office of Energy Policy, working with its partners plan to develop an approach to assist communities in developing energy management plans, conduct deep energy retrofits on facilities, educate and train facility staff and community leaders in energy management and provide assistance in obtaining financing for upgrades. The plans are to develop strategies and methods that can easily be replicated and used by any community regardless of size; bringing together energy professionals, financing groups, government agencies, community leaders and water and wastewater staff in a common goal of energy and facility management and responsibility.

In September the Governor’s Office of Energy Policy was one of 22 states to receive funding from the U.S. Department of Energy’s competitive grant program. This three-year grant was awarded on a collaborative basis with nine agencies and organizations including, the AZ Water Association. The US Department of Energy State Energy Program Competitive grant award provides funding to states submitting proposals to increase energy savings goals, finance energy efficiency upgrades and improve policy and planning of public facilities. With this building energy efficiency grant, the State of Arizona will work with partners on a statewide basis to implement deep, whole facility upgrades to improve the energy efficiency of 50 wastewater and drinking water systems.

The Water Energy Partnership in Arizona (WEPA) is intended to assist in a better understand of facility energy consumption by benchmarking energy use, identifying and addressing barriers to energy efficiency, and creating sector-based models of success that can be emulated by other state or local governments. Various agencies, universities and water groups throughout the state have focused on the importance of the water-energy nexus, yet much work remains. The intent is to provide details for wastewater facility leaders to recognize the value of the demand for clean, safe, affordable water and energy efficiency. To reach this goal, facility managers and operators will need resources to monitor and manage energy usage; and community decision makers will need facts that demonstrate the financial wisdom of supporting energy efficiency projects at their facilities.
Wastewater Treatment Committee Presents

Pima County Plant Tours
February 13, 2013

The Tour starts at 9:30 am at the Ina Road Facility.
Lunch will be at noon - sponsored by CH2M HILL

“Special thanks to Pima County and their staff for the opportunity to visit the facilities”

Pima County Regional Wastewater Reclamation District Water Reclamation Facility, Pima County, AZ

CH2M HILL designed and is providing engineering services during construction to expand the WRF from 37.5 to 50 mgd and convert high-purity oxygen treatment to nitrogen and phosphorus removal to meet stringent discharge standards. A unique disinfection approach using sequential chlorination to manage THMs and NDMA formation and upgraded and expanded the biosolids treatment system, including digesters, sludge dewatering, and thickening facilities was implemented. Other improvements include a new facility-wide odor control system, construction of a new electrical distribution system with a new 46kV substation and switchgear building, upgrade and expansion of the SCADA system, design and implementation of a new security system, remodel of the administration building, central maintenance building, and operations control center.

Ina Road WRF Capacity and Effluent Quality Upgrade
Pima County, AZ

The process scheme for the new WRF include influent screening followed by a grit/flocculation chamber, dissolved air flotation (DAF), secondary treatment, tertiary treatment and chlorination disinfection. Waste solids from the secondary treatment will be combined with float from the DAF and conveyed in a dedicated sludge pipeline to the Ina Road WRF. The secondary treatment system is a 5-stage Bardenpho system with the capability of operating in plug-flow or step-feed mode. The process scheme will purposely “bleed” ammonia through the secondary system for use later in forming chloramines for disinfection. Because of the process scheme selected, Pima County saved $70,000,000 in capital and will save over $5,000,000 in operational and maintenance cost over the 20-year life of the new WRF.

Questions: Contact Doug Kobrick, WWT Committee Chair, at jdkobrick@gmail.com
RSVPs: Due to space limitations, reservations are required. Please register online by Friday, February 1st, 2013 at www.AZWater.org - under “Featured Events”.
**Water Treatment Committee Seminar Series**

**Water Availability / Water Quality / Climate Change**

**Thursday, February 21, 2013**

**GateWay Community College**
Center for Health Careers Education Auditorium
Room CH1106
108 N. 40th Street, Phoenix, AZ 85034

**REGISTRATION FORM**

Note: use this form or register on-line at www.azwater.org

Attendee Name: ___________________________________________________________

Organization: ___________________________________________________________

Address: __________________________________________________________________

Phone: ________________ Fax: _____________ E-mail: __________________________

**Registration Fee:**

☐ AZ Water Member: $70
☐ Non-Member: $95

**Payment:**

Check (made payable to AZ Water)
Credit Card Payment (Mastercard, VISA and AMEX accepted)

Credit Card Number: ___________________________ Exp. Date: _____________

Cardholder’s Name: ___________________________

**Mail Registration and Payment to:**
Jacqueline Mubarak
Jacobs
101 North First Avenue, Suite 3100
Phoenix, Arizona 85003
Tel.: (602) 650-4960 Fax: (602) 253-1202

Valuable Professional Development Hours are available. You may be eligible to receive up to 5 PDHs!
**Water Treatment Committee Seminar Series**

*Water Availability / Water Quality / Climate Change*

**Thursday, February 21, 2013**

GateWay Community College
Center for Health Careers Education Auditorium
Room CH1106
108 N. 40th Street, Phoenix, AZ 85034

**AGENDA**

8:30 a.m. - 8:55 a.m.  REGISTRATION

8:55 a.m. - 9:00 a.m.  Welcome: Chairman, AZ Water Association - Water Treatment Committee
Herb Durbin, Jacobs

9:00 a.m. - 9:30 a.m.  Water Sustainability and Urban Climate Adaption in Central Arizona
Dave White, Arizona State University

9:30 a.m. - 10:00 a.m.  SRP Water Supply
Michael Patrick, SRP

10:00 a.m. - 10:30 a.m.  Potential Implications of Climate Change on Colorado River Supplies Available to the Central Arizona Project
Chuck Cullom, CAP

10:30 a.m. - 10:45 a.m.  MORNING BREAK

10:45 a.m. - 11:15 a.m.  Phoenix Drought Contingency
Brandy Kelso, City of Phoenix

11:15 a.m. - 11:45 a.m.  Flagstaff Water Management
Erin Young, City of Flagstaff

11:45 a.m. - 12:15 p.m.  Water Reliability - A Series of Investments to Ensure Tucson’s Water Future
Wally Wilson, Tucson Water

12:15 p.m. - 12:30 p.m.  LUNCH BREAK

12:30 p.m. - 1:15 p.m.  High Turbidity Event Panel Discussion - Contingency Plans and Lessons Learned
Paul Zelenka, City of Phoenix
Ray Shultz, City of Peoria
Ken Simpson, City of Tempe
Vicki Sharp, City of Chandler
Don Henderson and Brian Paulson, City of Scottsdale

1:15 p.m. - 1:45 p.m.  City of Phoenix Mixed Oxidant Trials for TTHM Reduction
Brian Fayle, City of Phoenix

1:45 p.m. - 2:00 p.m.  AFTERNOON BREAK

2:00 p.m. - 2:30 p.m.  Utility Case Studies of On-Site Generated Sodium Hypochlorite
Amlan Ghosh, Jacobs

2:30 p.m. - 3:00 p.m.  Operational Savings through Online THM Monitoring
Rudy Mui, Aqua Metrology Systems

3:00 p.m.  Wrap Up and Prize Drawings
I recently read a book called *Think and Grow Rich* written by Napoleon Hill that has sold over 15,000,000 copies. I would like to share from a chapter on “How to Outwit the Six Ghosts of Fear”.

For many of us there are three enemies which we must be aware of. These are indecision, doubt, and fear. Indecision crystallizes into doubt and the two blend and become fear! The six basic fears are:

- the fear of poverty
- the fear of criticism
- the fear of illness
- the fear of loss of love of someone
- the fear of old age
- the fear of death

It is important to remember that fears are nothing more than states of your mind. It is been said that, man can create nothing without first thinking of it. Man’s thoughts are immediately translated into some image which may as well be real. Every human being has the ability to completely control his or her own mind. The question is, will you control your mind or will you allow your mind to be influenced and be controlled by others? Nature has provided man with an absolute control over only one thing, and that is our thoughts. Everything that we create begins in the form of thought. Thoughts have a tendency to become their physical equivalent in the real world.

**Fear of Poverty** - the symptoms of the fear of poverty are exhibited by:
- indifference
- indecision
- doubt

It has been said, that 75% of all people who visit physicians for professional services are suffering from hypochondria. We all know how powerful the human mind is. It either builds or destroys. There are many psychological studies which have indicated that people may become ill through a series of internal or external suggestions.

**Fear of Ill Health** - The symptoms of the fear of ill health are exhibited by:
- hypochondria
- lack of physical activity and exercise
- self-coddling and susceptibility
- self-indulgence and substance abuse

It has been said that the money can’t buy the treasures of the heart and soul. The first step to being free from the fear of poverty is to associate with others which have clear goals and are positive about life. Your job should be more than just trading time or money, because when you think about it, time is all you really have. One needs to invest time rather than use time in order to have a balanced and successful life. When you are considering the purchase of anything in your life, consider how much of your life you are trading to earn the amount of money required to purchase that item. For example if you want to buy a new fishing boat, and it costs $10,000, ask yourself how much of my life is needed at work in order to earn $10,000? If the answer is one third of the year, then the fishing boat costs you one third of a year of your life and not a mere $10,000.

**Fear of Criticism** - The symptoms of the fear of criticism are exhibited by:
- self-consciousness
- lack of poise
- lack of a definite opinion
- inferiority complex
- spending beyond one’s income
- lack of initiative
- lack of ambition

Fear of Criticism takes on many forms, the majority of which are petty and trivial. The modern advertising industry takes significant advantage of our inherent fear of criticism in the means and methods they use through advertising. The fear of criticism robs man of his initiative, destroys his power of the imagination, limits his individuality, takes away his self-reliance, and does him damage in many other ways. It has been said, that criticism is one form of service of which everyone has too much. Criticism has been known to plant fear or resentment in the human heart, but it will not build love or affection or build a team.

**Fear of Loss of Love** - The symptoms of the fear of loss of love are exhibited by:
- worry
- over-caution
- procrastination

If you find yourself stuck in a pattern of any of these items, you may find it difficult to advance toward your goals and dreams. Remember that
• jealousy
• fault finding
• habitual negative behavior
• spending beyond one’s means to try and hold onto a loved one

It’s been said that jealousy is really man’s inherent fear of the loss of the love of someone. The fear of loss of love has probably always been with mankind.

Fear of Old Age - The symptoms of the fear of old age are exhibited by:
• tendency to slow down
• developing an inferiority complex
• habit of speaking apologetically
• habit of killing off initiative, imagination, and self-reliance

The fear of old age grows out of two main sources. The first is the thought that old age may bring with it poverty. The second is by far the most common source, that of urban legends and cultural fears. As our civilization advances, people naturally live much longer. Because our culture relies upon having enough money to purchase our goods and services that are provided by others, rather than being self-sufficient for our basic needs, the possibility of poverty in our later years of life becomes a greater fear. Another contributing cause of the fear of old age is the possibility of loss of freedom and independence, as old age may bring with it the loss of both physical and economic freedom.

Fear of Death - The symptoms of the fear of death are exhibited by:
• the habit of thinking about dying instead of living

To some this is the cruelest of all basic fears. The fear of the unknown coupled with the reality of eternity is a sobering influence. For many the fear of death is not as strong as it was in earlier times. Historically many ailments associated with the elderly have been linked psychologically to the fear of death. Intellectually we all know that this fear is useless. We all know the old saying, that the only two things that are certain are Death and Taxes. Because the world is made up of only two things, energy and matter, one must turn to their faith in the creator to be able to deal with this fear.

The greatest remedy for the fear of death a burning desire for achievement backed by useful service to others.

Old Man Worry

Worry is a state of mind based upon fear. An unsettled mind is helpless. Indecision is one of the major causes of an unsettled mind. It is been said that a recession is merely a series of worrisome indecisions which gain momentum until they create a state of mass indecision. During the great depression the whole atmosphere, all over the world, was filled with worry, fear, and indecision. The only known antidote for indecision is creating a habit of, and firm decision making coupled with action. Human beings no longer worry over conditions once they’ve reached a decision to follow a definite plan of action.

So you can see that the six basic fears become translated into a state of worry through indecision. Relieve yourself, forever from the fear of death, by reaching a decision to accept death as an inescapable event and come to terms with your creator. Win over the fear of poverty by reaching a decision to get along with whatever wealth can be accumulated without worry. Put your foot upon the neck of fear of criticism by reaching a decision not to worry about what other people think, do, or say. Eliminate the fear of old age by reaching a decision to accept it, not as an handicap, but as a great blessing which carries with it wisdom of age and experience, self-control, and a deeper understanding not known to youth. Free yourself of the fear of ill health by the decision to forget symptoms. Master the fear of lost love by reaching a decision to get along without love, if that is necessary and kill the habit of worry, in all of its forms by reaching a general, blanket decision that nothing which life has to offer is worth the price of worry.

With these decisions will come, poise, peace of mind, and calmness of thought which will bring Success and Fun to your life.

There is an additional threat that I want to share with you. This threat cannot properly be classified as a fear. This is more deeply seated and more often fatal than all of other fears that I’ve mentioned. This is the susceptibility to negative influences. Successful people protect themselves against negative influences and associations. If you do not protect yourself against negative influences you may forfeit your right to achieve your goals and desires.

Steps to Protect Yourself from Negative Influences:
• recognize that you may be lazy or indifferent and susceptible to all suggestions that harmonize with your weaknesses
• recognize that you are susceptible to these basic fears and develop habits that counter these fears
• remain sensitive and recognize negative influences
• stop pandering minor medical issues with medicines and other substances
• seek the company of positive people
• don’t expect trouble, expect prosperity and success

My hope is that this issue of Success and Fun will help each one of us change the way we think and act in our daily lives. I am honored to share my perspective on “SUCCESS and FUN”.

I hope to hear from you, contact me at phendricks@cox.net if I can be of assistance to you.
**AWWA DIRECTOR REPORT**

*Important Caveats.* While AWWA consulted experts in both parties in the development of this report, please remember that many important decisions that affect the water community won’t be made for some time. You can probably count on surprises as senior Administration officials and advisors change from election mode back to governing, and as the new Congress convenes.

Conclusion. Whether the candidates you supported in this election won or lost, please remember how special it is that Americans get to choose their leaders and set the nation’s fundamental direction. We really do have – to quote Abraham Lincoln – a government of the people, by the people, and for the people. To realize that vision, though, we have to “close the circle” after each election and look beyond the partisanship that elections necessarily entail. The nation now deserves our best efforts to pull together. AWWA knows the water community will do that, ever mindful that protecting public health and the environment is a sacred trust going far beyond politics.

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**TRIVIA QUESTIONS**

*From the Office of the AZ Water Association Historian*

| A. Where (and what) is the location that some people call the “longest cemetery” in the world? |
| B. Birth place of paper currency? |
| C. The earliest known written records? |
| D. Was Thomas Edison the first person to invent the electric light? |
| E. During which war and, at what battle, was Francis Scott Key inspired to write the words to “The Star Spangled Banner”? |

*See answers on page 54*
Call for Award Nominations...

Don’t Forget!

It is that time again to identify fellow Arizona water/wastewater professionals and worth projects for recognition at the 2013 AZ Water Association Annual Conference & Exhibition. Nominations due by March 25, 2013!

Award criteria, nomination forms, and points of contact for the AZ Water Awards Program can now be found ONLY online at www.azwater.org under the “Awards” committee page. Electronic applications will be accepted on the website starting January 1, 2013.

Questions can be directed to the Awards Program Committee Chair, William McCarthy at (602) 954-0407 or the Vice Chair, Alan Palmquist at (602) 438-2200.

Don’t Miss the March 25, 2013 Deadline!

2013 Awards Include:

AZ Water Awards
- Environmental Stewardship
- Kachina Award for Outstanding Service
- Nathan Burbank Environmental Educator
- Quentin Mees Research Award
- Select Society of Sanitary Sludge Shoveler
- Gimmicks & Gadgets
- Operator of the Year (Large and Small Systems)
- Plant of the Year (Large and Small Systems)
- Operations Supervisor of the Year (Large and Small Systems)
- Electrician of the Year
- Maintenance Mechanic of the Year
- Instrumentation Technician of the Year
- Water Reuse Project of the Year
- Water System Project of the Year
- Wastewater System Project of the Year
- Water Treatment Project of the Year
- Wastewater Treatment Project of the Year
- Engineer of the Year
- Young Professional of the Year
- Laboratory Excellence Award
- Safety Awards
- Scholarship Award
- Innovative Water Professional of the Year

AWWA Awards
- Warren G. Fuller Award

WEF Awards
- Arthur Sydney Bedell Award
- George W. Burke, Jr. Award
- William D. Hatfield Award
- Laboratory Analyst Excellence Award
Committee News

New AZ Water Committee – Energy Management and Sustainability

AZ Water is pleased to announce creation of the Energy Management and Sustainability Committee. The committee will seek to assist Arizona water and wastewater utilities with becoming more efficient and sustainable by promoting the exchange of information between the utilities, government agencies, academia, and consultants in the areas of energy conservation and management.

Through the committee, we plan to identify common goals, share success stories, and educate our members on the nexus between water and energy. Strategies for accomplishing this will include:

• Organizing specialty conferences in the areas of energy management, renewable and alternative energy, and water loss control.
• Organizing energy management specialty workshops.
• Soliciting papers and presentations for the AZ Water annual conference and AZ Water technical luncheon program.
• Organizing tours showcasing energy management and alternative energy technologies.
• Writing regular AZ Water Kachina News articles to highlight important issues and events related to energy.

The inaugural meeting will be held in early February. If you are interested in participating in this group, please contact Andy Terrey at andy.terrey@phoenix.gov.

Young Professionals Committee

The AZ Water YP Committee wrapped up another successful year – recruiting, networking and reaching out to our members!

Out networking events included a monthly luncheon that really allowed members to get to know one another and create a strong bond between those members who attended. It also gave the students a chance to hear what it is like working in the industry because they got to hear about life outside the classroom. It is definitely a more intimate level. Other networking events were student-targeted including happy hours get-togethers with ASU, GateWay Community College and U of A. These were perfect for getting new recruits and supporting our big focus on sharing the importance of membership. In addition to meetings, this was great for getting to talk one on one with other members about why being a Young Professional is important to them.

One of the most fun aspects of the YP committee is reaching out to our K-12 and secondary education community. Our annual outreach activities included a “tap water taste test challenge” during E-week activities at the Arizona Science Center, judging for the AZ Water Scholarships, and awarding a prize to the Future Cities contestants. Talk about “young” professionals! It is inspiring to see so many little scientists together in one room.

The annual conference is always a fun opportunity for us. Hawking raffle tickets in the hallways and giving new YPs an opportunity to network. This year we focused on career and personal development with a series titled, “How to build your career and keep your head on straight”. Speakers touched on the careful play of developing your career without losing sight of your personal goals.

The fall always keeps us busy with the annual Bowl-A-Thon in September drawing 40 bowlers to show off their 10-pin skills. We look forward to growing the bowl-a-thon back to its historic proportions and this year was a great start. Also, the YPs volunteered to work a booth at Oktoberfest slinging beers in support of Tempe Sister Cities. This sparked ideas for the next annual Oktoberfest to promote the Young Professionals as well as the water industry and being water wise. No Water, No Beer!

November’s kickball tournament between AZ Water YPs, ITSE and ASCE was a huge success! With about 30 attendees, the field was packed and comradeship was in the air. Although there was a spark of competition, fun was had by all. The trophy went home to its rightful place with the AZ Water YPs, however, we stopped keeping score and it may have been closer than we’d like to admit.

As the year winds down we come to give our appreciation. We simply cannot thank our supporters within the AZ Water Association and our partners enough. Without our core committee of dedicated members and passionate YPs and even the “seasoned” professionals we couldn’t accomplish nearly so much as we did this year. Cheers to another great year!

Wastewater Treatment Committee

The revitalized Wastewater Treatment Committee is working on a number of education and outreach activities. The committee meets monthly and new members are always welcome to join in! The committee has created a new vision, mission and strategies statement and launched a new committee webpage on AzWater.org. Check it out for committee news, information and also many helpful links to wastewater treatment information resources.

The committee held its first plant tour at the Ocotillo WRF in November, which was well-attended and an excellent start on a series that will include numerous other plant tours in the future. The next two tours are at the newly expanded and upgraded City of Casa Grande WWTP on January 18 and the two Pima County reclamation facilities, currently undergoing major improvements, to be held on February 13.

The committee is also planning a series of webinars to be held in 2013, building a registry of Arizona wastewater treatment facilities to serve as an information-sharing resource, continuing to add useful information to its webpage, and working on an effort to help improve preparation and success for Arizona WWTP operators taking their certification exams.
Below is more information about the Pima County Tours in February (also see flyer on page 33). And, if you are interested in learning more about Doug Kobrick please contact him at jdkobrick@gmail.com.

On February 13, 2013, the AZ Water Wastewater Treatment Committee is hosting tours of two Pima County wastewater reclamation facilities; the Pima County Regional Wastewater Reclamation District and the Ina Road facilities. The tour will start at 9 AM at Ina Road facility, followed by the Regional Wastewater Reclamation District, then a hosted lunch.

This will be a great opportunity for all AZ Water members to see these facilities and hear about some of the unique design features at the plants. Capacity is limited, so sign up before February 1, 2013!

Pima County Regional Wastewater Reclamation District Water Reclamation Facility

The process scheme for the new WRF include influent screening followed by a grit/flocculation chamber, dissolved air flotation (DAF), secondary treatment, tertiary treatment and chlorination disinfection. Waste solids from the secondary treatment will be combined with float from the DAF and conveyed in a dedicated sludge pipeline to the Ina Road WRF. The secondary treatment system is a 5-stage Bardenpho system with the capability of operating in plug-flow or step-feed mode. The process scheme will purposely “bleed” ammonia through the secondary system for use later in forming chloramines for disinfection. Because of the process scheme selected, Pima County saved $70,000,000 in capital and will save over $5,000,000 in operational and maintenance cost over the 20-year life of the new WRF.

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The 9th Annual YP Summit, Sunday, March 2013, will be held in conjunction with the Utility Management Conference, March 10-13, 2013 Renaissance Phoenix Glendale Hotel, Glendale, AZ.

Saturday, March 9th—AWWA and WEF YP Committee Meetings
Sunday, March 10th—YP Summit
YP Summit Fee—$75
YP Summit and UMC Registration Fee—$150
To register, go to UMC, YP Summit is listed under Workshops
www.awwa.org/conferences/utility

Questions on YP Summit
Corianne Hart, 503.977.6678 CHart@BrownCald.com | Dustin Dale, 218.299.5610 Dustin.Dale@ae2s.com

Questions on YP Summit Sponsorship
Contact Corrine Kluge, 972.239.9949 clingen@carollo.com | Nancy Sullivan, 303.347.6155 nsullivan@awwa.org
Committee News

Continued from page 41

Does she update AZ Water members, she also coordinates database updates from WEF and AWWA too! Other City of Phoenix volunteers are also helping to develop strategies to make the database easy to use.

Brandy Kelso and Troy Hayes recently recruited 23 new student members from ASU while giving a water/wastewater presentation at Dr. Rosa Krajmalnik Brown’s Civil and Environmental Engineering (CEE) 361 – Introduction to Environmental Engineering class. The Membership Committee is also planning several more university and college recruiting presentations in 2013 including at the U of A and NAU, and will be coordinating these efforts through the YP Committee and Mike Ambrozak.

Uday Gandhe and Monica Flores are putting the final touches on new membership certificates featuring the (relatively) new AZ Water logo. These certificates will be mailed to all current members in spring 2013, and will be very sharp!

Jacqueline Shaw and Patrick Goodfellow are working on updating the Association’s recruiting brochures and materials. They will also be keeping us at the leading edge of ‘the latest’ technologies by incorporating QR codes into recruiting materials, and a future ‘app’ to track annual conference activities.

If you have ideas on how to further the Membership Services Committee objectives, or can lend some of your talents, please contact the committee chair Mark Gross at mgross@carollo.com or Debbie Muse at musegroup@aol.com. Come to one of our monthly meetings and you will at least get a free lunch in exchange for an assignment!

Water for People Committee Recap 2012

The Committee looks forward to another big year for Water For People. The schedule of events for 2013 is taking shape. Visit the Water For People Committee page on the AZ Water website (www.azwater.org) throughout the year for dates, sponsorship opportunities, and other information.

The Committee wants to include Everyone in helping end water poverty throughout the world. Everyone can do something important: join the committee, sponsor a Water For People event, or your own workplace giving event at your place of employment, make a personal contribution to Water For People, spread the word to family, friends, and neighbors. As part of the water community, we all understand the importance of safe water and sanitation, and are aware of the crisis in the developing world.

We have the power and knowledge to do something about it!

Water For People Hike-a-Thon

A year winds down and a new one springs anew with promises of more exciting days to come. Water For People in Arizona had another banner year in 2012, all due to the unbounded generosity of the Arizona water community and the undying dedication of a growing group of committed volunteers. Fund raising events in 2012 netted $44,000 for Water For People. Thank you to all event sponsors, participants, committee volunteers, and friends.

Whatever one’s interests, the Water For People Committee has an event for you: golf, volleyball, water pong, biking, hiking, and now running.

Added to the lineup of great events in 2012 was the inaugural “Run for World Water” at Kiwanis Park in Tempe.

The final events of 2012 were the Pedal with Purpose at El Tour de Tucson and the Hike-a-Thon at South Mountain Park. Both events have truly become major AZ Water fundraisers for Water For People.

Pedal with Purpose, El Tour de Tucson

What an exciting time we had this year at the El Tour de Tucson bicycle event. While for many it’s a race or a chance for a personal best, for many others it’s a chance to enjoy an event that offers so much. With the numerous sag stops to visit along the way, friendly riders to share conversations along the route or the friendly bike patrol when you find you need assistance, those of us riding for Pedal with Purpose had a fun and wonderful time.

Pedal with Purpose was formed several years ago to provide for an opportunity to raise funds for Water For People. It was based from the nation Ride with Purpose motorcycle ride to AWWA’s annual conference to benefit Water For People.

To begin the festivities of the race, the Pedal with Purpose committee organized a carb loading dinner the night before the event. It was held at the Temple of Music and Art and the food was outstanding. Many thanks go to the Southern Arizona Water Users Association (SAWUA) for sponsoring the dinner for all of us.

Well, this year there was so much more as the ridership increased from 7 last year to 28 riders this year. While there were a couple of diehards that did the full 111 mile ride, the majority of us weekend warriors chose the 60 or 42 mile events. I decided the 60 mile was good enough for me and was joined by a couple other water utility directors along with a few consultants from both Phoenix and Tucson. The day was absolutely perfect for a ride and getting a late morning start allowed the temperature to warm a bit for us. With the start of the ride climbing uphill on Swan Road, the large group of riders began to spread out quickly. A few of us chose to ride together and proudly display the new Water For People bike jersey made specifically for this event.

For most of us, the ride was fast, safe and lots of fun. Some new riders with little experience surprised themselves with how well they were able to do and except for a flat tire or two, everyone made it to the finish line safely.

What awaited us at the Pedal with Purpose tent at the finish was probably the best part. Sandwiches, beverages and cookies helped replenish our bodies with much needed nutrition and fluids. However, the surprise gift was the ability for a full massage! With some of us maturing a bit, having those tired and sore muscles worked over by a professional masseuse was worth the price of admission.

The Pedal with Purpose committee did a great job in organizing this event and helping to raise money and awareness for Water For People. It’s never too early to begin thinking about next year’s ride and start your training early. Next year there are plans to include opportunities for families to participate in some shorter fun rides as well. And if you’re looking at wanting one of those sharp looking bike jerseys to wear while you are training for next year, they will be available on the AZ Water Association website. Many thanks to the sponsors of the jerseys for their continued support of Water For People (see pages 52-53).

Want to be a part of a stellar El Tour team, even though you were not able to Pedal with Purpose or attend the event? You can proudly display the new Water For People jersey made specifically for this event. For even those who have never ridden, you can proudly wear the team jersey and support Water For People. Team jerseys are for sale at the AZ Water website at: http://www.azwater.org/wfp/cyclingjersey.aspx

Mark your calendars for next year’s race on Saturday, November 23, 2013.

Water For People Hike-a-Thon

Also on November 17 was the 8th Annual Water For People Hike-a-Thon at South Mountain Park. Eighty-five hikers and volunteers braved the chilly morning temps at South Mountain Park in Phoenix to conquer the mountain. Teams carried more than 150 gallons of water to the top of the mountain to symbolize the struggle of many in the developing world without access to clean water.

Kudos to this year’s Water Haulers:
➢ Most Gallons Total: Snoopy 2.0 (Henkel team) carried up 67 gallons total.

➢ Most Gallons per Person: Scottsdale Water Dogs (City of Scottsdale) hauled up 32 gallons or 10.67 gallons per person!!

➢ Additional kudos to Gannett Fleming’s haulers (36 gallons), Black and Veatch (6 gallons), Sha Sha Walker’s hikers (1 gallon) and to the Scottsdale Water Dogs for donating gallons of water as well!!

After the hike to the top and back, Chefs Levi Dillon and Chuck Ritter had breakfast burritos prepared for the hungry hikers, and DJ Twist supplied the awesome music. The food and music added to the fun atmosphere of the morning!

The event netted $2735 for Water For People and made a substantial donation of water to Lodestar Day Resource Center in downtown Phoenix. See the full-page summary of the event and acknowledgement of our generous sponsors on page 55.

UPDATE ON THE LEAD AND COPPER RULE

USEPA is scheduled to propose its “long-term” revisions to the Lead and Copper Rule (LT-LCR) in 2013. The exact timing is uncertain, but it is likely in 2013. Of particular interest is USEPA’s approach to implementing the Reduction of Lead in Drinking Water Act (P.L. 111-380). Agency statements emphasize the need for regulatory language to implement P.L 111-380 and that the most expedient administrative process is the LTLCR rulemaking.

P.L. 111-380 changes the Safe Drinking Water Act (SDWA) definition of “lead-free” to <0.25% and changes the compliance calculation. At present, there seems to be broad technical agreement that NSF-372 is a sound, independent standard for determining if a plumbing product meets the new definition of lead-free, but USEPA has not made any official statements to this effect.

Perhaps most important, the law’s effective date is January 4, 2014, and this effective date will occur well before USEPA finalizes the LT-LCR. The drinking water community will need to use its best judgment as to how to effectively comply. Providing more timely guidance than the proposed LT-LCR seems unlikely given recent court cases on rulemaking through guidance.

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THURSDAY | 01.03.13

Topic: Central Arizona Salinity Study (CASS)
Presented By: Tom Poulson, U.S. Bureau of Reclamation
Register By: January 2, 2013
Sponsored By: Brown and Caldwell

THURSDAY | 02.07.13

Topic: Water for People Experience in Bolivia
Presented By: Mark Taylor, Westland Resources, Inc.
Register By: February 6, 2013
Sponsored By: HDR Engineering, Inc.

THURSDAY | 03.07.13

Topic: Pima County’s Sanitary Sewer Rehabilitation Program
Presented By: John Warner, PCRWRD
Register By: March 6, 2013
Sponsored By: Carboline

THURSDAY | 04.04.13

Topic: Tucson Water’s Recycled Water Master Plan
Presented By: Jeff Biggs and Wally Wilson, Tucson Water
Register By: April 3, 2013
Sponsored By: EMA, Inc.

PDH Certificates are available for attendance at these meetings.

For more information please register online at the AZ Water Website under “Featured Events” http://www.azwater.org
2013 AZ Water Conference & Exhibition
Marketing Brochure Cover Art Competition

A competition is underway to find a fabulous cover for our 2013 AZ Water Annual Conference & Exhibition marketing brochure cover. We’re reaching out to our talented membership to create a fantastic cover for our program.

The Specifications

- Finish cut/trim size of brochure: 8.375” x 10.875”
- Finish bleed size: add 1/4” to all margins to be trimmed: 8.625” x 11.125”
- High Resolution PDF file preferred, with NO CROP MARKS. Also accepted: High resolution jpg, tiff or vector eps file, with all fonts outlined.
- For use throughout the brochure, please supply any images or logos or text in separate files with no backgrounds, so they can be used by themselves, separately, throughout the brochure.

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The city of Boston, Mass., has recently built and now has in full operation a system of sewage and drainage works that mark an important advance in sanitary engineering. A summary account of these works has already been published by us. But as they include engineering work of the highest order, and as a number of perplexing problems are successfully solved in their construction, they appear to merit a fuller account.

By referring to the map which accompanies this article, it will be seen that Boston lies upon a peninsula. One side is the Charles River, separating it from Cambridge; on the other side are the waters of the South Bay; while a portion of its water front abuts directly upon the expanse of Boston Harbor. Originally, the sewage was disposed of as in New York. It was allowed to run out into the water from numerous outlets. This was found objectionable. The water became contaminated, and the dock frontage was injured by the deposits of sludge. As the sewers were all constructed and in place, only the radical method of dealing with the problem seemed practicable. It was determined to surround the city with an intercepting sewer, which should receive the delivery from all the lines formerly discharging into the harbor and adjacent water. From this intercepting sewer, that was to encircle the city like a girdle, the sewage was to be taken to a distant point and, after proper clarifying, was to be discharged into the harbor.

Referring again to the map, the course of the new works, constructed in accordance with these ideas, may be traced. The old system, though still in place and in use, is not shown. The heavy black line encircling the city indicates the intercepting sewer. While it was constructed so as to cut off the discharge into the water of the bay of all ordinary drainage, the old outlets were not completely closed. They are preserved, and, by means of dams or gates, are arranged to discharge all over a certain amount. This amount is made great enough to allow for all ordinary flow and for the lighter rain storms. In case of heavy falls of rain, the overflows come into action, and permit part of the water to run directly away into the bay.

From the city the transit lines run eastward, and reach eventually a low, marshy piece of land called the “calf pasture”. Over this a causeway, marked Mt. Vernon Street on the map, has been built. Under its roadway the sewer runs for about a mile. At the end of this line the pumping station is established. Up to this point in the main and intercepting sewers, devoted to the city of Boston and environs, a length of 13½ miles is included. The diameter of the main line varies from 7½ to 10½ feet. Its mean descent is 1 in 2,500. The bottom of its delivery end at the pumping station is 14 feet below low water level.

The pumping station, of which we give an exterior and interior view, is a fine structure. It is built of granite, and in its architectural features is worthy of all commendation. Its general plan includes two wings, with a connecting building. One wing is devoted to coal storage, and from within it the large chimney rises. The capacity of the coal bins is 6,000 tons. In the connecting building the boilers, four in number, are placed. Each pair is of 250 horse power,

WITHIN THE UNITED STATES, NEW SEWERAGE DEVELOPMENTS OFTEN STARTED ON THE EASTERN SEABOARD AND SPREAD FROM THERE.

The late 1800’s, within the United States, were the times of new ideas; and, the industrial age was available to help bring those ideas to practical fruition. Such was the case with the collection, conveyance and the disposal of sewage. The following article, entitled “The Boston Sewer System and Main Drainage Works” (from the 3 Dec 1887 edition of Scientific American), illustrates the use of (then) modern steam powered pumps (and, other mechanical innovations) to collect the City’s “combined sewage flows, screen it and thereafter transport it out, away from the City (proper), to a point of discharge in Boston Harbor. “Learning” was a slow process, but at least their “direction” had merit; even so, quite an endeavor for the 1880’s!
and can supply all the steam required in ordinary working. They are built of steel; each one has 45½ square feet grate surface and 1,826 square feet heating surface, giving a ratio of 40:1. Exhaustive tests of efficiency were made in the spring of 1885, showing an evaporative power of 10×43 lb. of water per pound of dry coal from water of the actual existing temperature; reducing to a commercial efficiency of about nine pounds. During these tests the boiler under trial was indicating from 112 to 134 horse power.

In the other wing are situated the pumping engines. These are divided into high duty and low duty engines. Of each class there are two, each engine having two cylinders.

On the first page of this paper we illustrate the great high duty pumping engines, designed by Mr. E. D. Leavitt, Jr. They are impressive structures, and present an imposing appearance, as the great flywheels ceaselessly rotate, and the engines quietly do their duty and dispose of the drainage from nearly ten square miles of territory. They are compound beam engines. The pumping cylinders, of which there are two, are directly below and in line with the high and low pressure steam cylinders. The low pressure steam cylinder is situated at one extremity, the high pressure cylinder at the other extremity of the walking beam. This secures a very even disposition of the main working parts of the engine. The walking beam is pivoted at about the floor level. From one of its ends the pitman rises to the crank. The pitman end of the walking beam is provided with an oblique extension or horn of suitable angle to secure the best working of the connections. The flywheel journal is nearly on a line with the lower heads of the steam cylinders. The leading dimensions of these engines are as follows:

Diameter of plunger..........................48 in.
Length of stroke........................................9 ft.
Distance between centers of | cylinders..........................15 ft. 2 in.
Radius of beam to end centers..................8 ft. 3 in.
Radius of drum........................................4 ft.
Diameter of flywheel.............................36 ft.
Weight of flywheel..............................36 tons
Nominal capacity of each engine, ..............................25,000,000 gallons a day
Speed for capacity....................11 revolutions per minute

They were tested at the same time with the boilers, and gave a very high efficiency. Each test extended over 24 hours’ running. In one trial an indicated power of 251 H.P. was obtained, in the other 290 H.P. In sewage lifted with no allowance for slip of pumps (8½ per cent to 4½ percent to be added), an actual power of 219×9 and 243×5 H.P. respectively was attained. Per indicated horse power an average of 134 pounds of coal was burned per hour. With new valves, the slip of the pumps reduces to 2½ percent. A portion of the steam was used to drive the feed water pump. Allowing for this, the duty of the pumping engine reduced to 122,500,000 foot pounds per hundred pounds of coal. This gives an extremely high efficiency, and speaks well for the design of the pumps. They were built by the Quintard Iron Works, and cost $115,000 each. The low duty engines were built by Henry R. Worthington & Co. They cost $45,000 each. The leading data for each one is as follows:

Nominal capacity......................25,000,000 gallons a day
Speed for capacity.............................12 double strokes per minute
Diameter of high pressure cylinder..............21 in.
Diameter of expansion cylinder..................36 in.
Diameter of plunger..............................45 in.
Length of stroke........................................4 ft.
Guaranteed duty, in foot pounds...........................1,000 lb. of coal, 60,000,000.

They are of the well-known horizontal type of these makers, with a new style of hydraulic valve gear.

The pair of high duty engines cost $140,000 more than the pair of low duty engines. The total coal burned in 1886 cost $7,789.55. They cannot well be credited with a saving of over this amount during the year. Doing this, their saving will represent only a little over 5 per cent on their excess of cost over cheaper low duty engines. This is supplemented, of course, by a saving on boiler capacity; but the latter is of minor account. Hence they probably illustrate one of those cases in engineering where capitalization of improved apparatus is barely paid for by the increased economy effected. Still, every hydraulic engine aims for high efficiency, and it seems only fitting that such a great city as Boston should have the most perfect engines that are procurable for money.

The low duty engines are used when a heavy rain sends a large volume of drainage to the station. The bulk of the work is done by the high duty engines.

The sewage is pumped out of the delivery sewer, first being screened through cages of one inch mesh. Here one or two cubic yards daily of material is arrested. It is collected from time to time, pressed in a hand press, and burned under the boilers.

From the pumps the screened sewage is delivered through mains four feet in diameter, one for each engine, to two parallel lines of deposit sewers. The latter are built of concrete masonry, forming a monolithic mass, and each one is 1,260 feet long, 8 feet wide, and 16 feet high.

Through them the liquid flows at a rate of about 3 inches per second. The fine material held in suspension is almost completely deposited in the first 600 feet. About midway of their length a twelve inch pipe enters them, from one side, connecting with vertical trunks. One trunk is in each sewer, with two gates near the lowest level. On opening one or the other of these gates, the lower layers of water rush out with high velocity, carrying with them the solid material that has accumulated. To assist in feeding it up to these trunks, a chain feeder is employed and also a moveable scraper. Both are illustrated. The chain feeder, constructed on the principle of a chain pump or grain elevator, draws the material along to the mouth of the discharger pipe, which engulfs all that comes near it. The moveable scraper consists of a dam or screen that approximately fits the sewer. An extension platform runs back from its base, and when the

continued on page 50
machine is in use, received 4,800 pounds weight to keep the end down. A chain holds the gate upright against the pressure of the water. This machine is put in position at the end of the sewer nearest the pumps and the sewage is turned in. It runs over the gate and also to some extent around and under it, pressing the scraper forward at the same time. The pressure and scouring action of the water work and force the deposit forward until it reaches the outlet trunk. To replace the scraper, the weights are removed and it is floated back.

The current through the outlet pipe is sufficient to carry a half brick with it, and sticks can even be carried by it around the bends. The sludge is delivered to a tank. As much water comes with it, this, after settling, is permitted to flow on and into the sewer again, beyond the deposit lines. The sludge is taken out to sea in a barge, and dumped into the water.

In 1886 the maximum daily amount pumped was 111,587,337 gallons, the average daily amount was 36,866,129 gallons. The cost for labor, fuel, repairs, and general expenses, no interest or depreciation being included, was for 1886, $29,168.34. The lift varies from 35 to 45 feet, and the cost per million gallons lifted one foot is put at $0.059, or about six cents. Some seven or eight cubic yards of sludge are collected daily from the deposit sewers. The sewage, now almost clean water, is carried through a 7½ foot sewer, 7,160 feet long, across Dorchester Bay, then through a temporary flume, 11 feet high and 12 feet wide and about 6,000 feet long, to the reservoirs on Moon Island. Here it is collected and impounded. The gates are worked by a long shaft, nearly 600 feet long, that carries bevel cog wheels in pairs, one pair for each gate. By setting these, the shaft, though revolving in one direction, can be made to either open or shut the valves. The shaft is driven by a turbine wheel, which is turned itself by the drainage water, a portion of which is diverted for this purpose. A steam plant is provided, also for use when the turbine is laid up. The bottoms of the reservoirs are shaped so as to favor perfect drainage. To flush them, drainage is allowed simultaneously to enter at one corner and flow out at the other. This scour them perfectly, leaving the masonry bare and clean. Samples of the fluid collected here are as clean as rain water, except for a slight deposit. The fluid has a strong odor, however. The men in charge make no complaint, and their health seems perfect. The flume leading from Squantum to Moon Island, and which we have referred to as only temporary, is carried by a new embankment. When this shall have settled and reached a definite level, a permanent masonry structure will be built and the system will then be complete.

*See Scientific American Supplement, No. 524.

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For early registration, go to AZWater.org and click on “Calendar & Events” on the left hand side of the page. Select the workshop that you want to attend, and click “register”

The Distribution Committee strives to provide networking and training opportunities for all water professionals to advance their distribution system knowledge and education.

Distribution Committee Leadership:
• Mike Barone: Chair (mike.barone@westonsolutions.com)
• Brad Jeppson: Vice Chair (bjeppson@carollo.com)
• Larry Leischner: Secretary (LeischnerLarry@stanleygroup.com)
• Matt Tasch: Past Chair (mtasch@superiortanksolutions.com)
Many thanks to our riders, volunteers, and sponsors for a successful 2012 event!

**Pedal With Purpose** riders take on two challenges: riding El Tour de Tucson and raising money for Water For People to develop innovative and long-lasting solutions to the water, sanitation, and hygiene problems in the developing world. We celebrated our 5th year with 28 riders!

Join us next year for El Tour de Tucson on Saturday, November 23, 2013. Main event distances include 111, 85, 60, or 42 miles, or choose the Fun Ride 10, 5, or 1/4 miles.
Thank you to our Pedal With Purpose sponsors!

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TRIVIA ANSWERS

A. The Great Wall of China. Records indicate that about 1 million prisoners and slaves were used to build this Wall; many died along the way and their bodies were added in with the rubble and masonry used to build the Wall – a quick way for the disposal of the bodies.

B. Paper currency was first developed during China’s Tang Dynasty – in the 7th Century. Its use spread from there! Marco Polo, a Venetian merchant traveler, brought samples of the currency back to Europe in the late 1200s. The Massachusetts Bay Colony issued the Colonies’ first circulating banknotes in the late 1600s.

C. The Phoenicians provided the earliest (1500 BCE) example of writing, in which sounds were represented by written symbols. The created symbols represented the 22 consonants they used in their verbal speech. The ancient Greeks generally get credit for bringing vowels into use and, they gave us the term we now use for describing this writing system called the alphabet.

D. No. Approximately 20 others invented an “electric light” before Edison did, but Edison was the first to invent an electric light bulb that was commercially viable with a 13.5 hour working life.

E. The War of 1812 (United States vs Great Britain). During the British attack on Fort McHenry (Maryland/Chesapeake Bay) in 1813, F. S. Key penned the words to “The Star Spangled Banner”.

See questions on page 38
8th Annual Water For People Hike-A-Thon

Saturday, November 17, 2012
South Mountain Park

The Water For People Arizona Committee sincerely thanks our wonderful sponsors!

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On November 7 and 8, 2012, the AZ Water Association Pretreatment Committee conducted its second annual "Pretreatment Training Workshop". Gathered at the Gateway Community College, 70 professionals with a wide range of experience in pretreatment activities were in attendance. Attendees learned about the regulatory and technical considerations that are important to successfully developing and implementing a Pretreatment Program under the National Pollutant Discharge Elimination System (NPDES) permitting provisions of the Clean Water Act (CWA). The training was conducted by more than a dozen experts representing a wide range of backgrounds and experience in pretreatment, including academics, regulators, managers and supervisors, plant operators, retired professionals and consultants.

The first day of the workshop consisted of twelve presentations. The presentations covered a wide range of topics related to implementation of pretreatment programs, including overview of the program at the national level, regulatory updates, legal authority, users identification and classification, industrial user permitting, prohibitions and categorical standards, local limits, inspections and monitoring, reporting requirements, data management, compliance evaluation, pollution prevention, civil/criminal enforcement and funding. Presenters used real world examples to walk through their approach and rationale. An opportunity for questions and answers followed each presentation.

The morning of the second day was dedicated to a field training demonstration of pretreatment procedures at an existing industrial discharger within the City of Phoenix. The field training activities were organized by the City of Phoenix Pollution Control Department. For this demonstration, the group was divided in smaller teams which rotated through different demonstration areas prepared by the City of Phoenix.

The afternoon of the second day included discussion of topics that are gaining increasing attention in the "pretreatment world." Instructors gave presentations on emerging contaminants, management of unused pharmaceuticals, new developments in flow metering and sample collection at metering stations, and improved procedures for conducting compliance inspection and monitoring.

The AZ Water Association Pretreatment Committee expresses its gratitude and appreciation to each of the instructors for their exceptional commitment and participation in this workshop. The Committee also thanks Gateway Community College for providing a very satisfactory conference room and related support for the workshop. The Committee further recognizes and thanks the AZ Water Association for the support, tools, and guidance it provided. Their assistance was critical in making this a successful workshop.

Finally, we send a thanks to each of the workshop participants. The Pretreatment Committee aims to improve the quality and content of future workshops and other activities. Please consider becoming a member of the committee to help us in that effort. We would be delighted in your participation. You may contact us through the AZ Water Association website: www.azwater.org.
Legend Technical Services of Arizona, Inc. (LEGEND), a full-service environmental laboratory, is providing assistance to water and wastewater operators and the environmental community in obtaining training and professional development hours (PDHs) through free workshops held throughout Arizona. Workshops will be held in outreach areas as well as in the Phoenix and Tucson metropolitan regions.

Check the AZ Water Association website (www.azwater.org) for upcoming workshops.

ENVIRONMENTAL WORKSHOP – TRAINING with 4 FREE PDHS
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72 E. 1st St., Florence, AZ 85132

8:00 AM – 8:50 AM  Dianne Frydrych, LEGEND – How To Get The Most From Your Commercial Laboratory
9:00 AM – 9:50 AM  Denise Edwards, City of Coolidge Operator – Field Testing Parameters
10:00 AM – 10:50 AM  Ron Lujan, Town of Florence Operator – Wastewater
11:00 AM – 11:50 AM  Denise, Ron, Dianne – Staying in Compliance for Your Facility

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Seating is limited and this Workshop will fill up fast.

LEGEND would like to thank the Town of Florence and the Florence Fire Department for their support to ensure Operators get their needed PDHs.

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☐ residual/biosolids management
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☐ toxic & hazardous materials
☐ public education / information
☐ instrumentation/automation controls
☐ other _________________________

JOB TITLE
☐ EXECUTIVE: commissioner, board member, city manager, mayor, president, vice president, owner, partner, director
☐ MANAGEMENT: division head, section head, manager, chief engineer, comptroller, etc.
☐ ENGINEERING/NON MANAGERIAL: civil engineer, mechanical engineer, environmental engineer, planning manager, field engineer, system designer
☐ SCIENTIFIC/NON MANAGERIAL: chemist, biologist, biophysicist, researcher, analyst, etc.
☐ PURCHASING: purchasing agent, procurement specialist, buyer
☐ OPERATIONS: foremen, operator, maintenance, crewman, service representative, etc.
☐ MARKETING & SALES-NON MANAGERIAL: market analyst, marketing representative, sales representative, etc.
☐ STUDENT
☐ RETIRED INDUSTRY REPRESENTATIVE
☐ OTHER _________________________

Member Dues are Subject to Change

☐ Individual Annual Membership — $45
☐ Student Annual Membership — $15

RETURN YOUR MEMBERSHIP APPLICATION ALONG WITH ANNUAL DUES TO:
AZ Water Association
1042 Willow Creek Rd., A101-510 • Prescott, AZ 86301

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