APG-Neuros introduces efficient and affordable advanced technology blowers, blower packages, and complete aeration systems for municipal and industrial applications.

The NX series are on a different level: As of August 2010, APG-Neuros is confirmed as the market leader in the High Speed Turbo Blower category in North America, with over 300 units installed, and over 150 on order. The oldest unit is reaching four years, with over 30,000 hours of continuous operation, in an outdoor installation at a Waste Water Treatment Facility.

Compared to old technology, the NX series can save over 30% in operating costs, saving time and money. Our competitive advantage is superior quality, efficiency, performance, and UL, CSA, and CE certifications.

APG-Neuros produces their NX Series Blowers in the USA. A second production facility is scheduled to be completed by the end of May, in Québec, Canada. This facility will also serve as the head office, focusing our engineering and sales functions, and senior management.

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Kate Flanagan, Dave Redman, Dennis Ernie
1820 W. Drake Drive #105
Tempe, AZ 85283
Tel: 480-940-6823
Fax: 480-940-6935

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Production Facility
APG-Neuros Inc.
160 Banker Road
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  WEF National Delegate  
  602-391-8898  
  paul.kinshella@stantec.com

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  602-771-4661  
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**AZ Water 2012**

**Kachina News**

**Article and Advertisement Deadlines**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>WINTER</td>
<td>December 10</td>
</tr>
<tr>
<td>SPRING</td>
<td>March 10</td>
</tr>
<tr>
<td>SUMMER</td>
<td>June 10</td>
</tr>
<tr>
<td>FALL</td>
<td>September 10</td>
</tr>
</tbody>
</table>

**ACCEPTABLE FORMATS INCLUDE**

- high-resolution PDF files with fonts embedded, Adobe Illustrator 9.0 .eps files, .tif files, .jpg files, or Microsoft Word files. Include any high-resolution (300-dpi) photos or artwork used with Microsoft files separately as either .tif or .jpg.

Mail or e-mail all articles or advertisements to:

**AZ Water Association**

1042 Willow Creek Road  
A101-510  
Prescott, AZ 86301  
musegroup@aol.com  
www.azwater.org

Publication of any article/comment herein does not constitute an endorsement by the AZ Water Association or staff.

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- Aqualitec Corp.  
  37
- Black & Veatch  
  74
- Brown and Caldwell  
  46
- Carollo Engineers  
  10
- CDM Smith  
  6
- CH2M HILL  
  32
- Coombs/Hopkins  
  74
- Dibble Engineering  
  74
- DN Tanks  
  31
- Ecoverde Technologies  
  15
- EEC  
  74
- FANN Environmental  
  30
- Fluid Technology  
  13
- Gannett Fleming  
  45
- GHD  
  8
- Golder & Associates  
  11
- Greeley and Hansen  
  4
- HD Supply  
  20
- HDR  
  11
- Hennesy Mechanical Sales  
  74
- IES Southwest Inc.  
  5
- Kennedy/Jenks Consultants  
  74
- KUV Consultants, LLC  
  74
- Layne Water Technologies  
  27
- Legend Technical Services  
  46
- M. E. Simpson Company IBC  
  27
- Malcolm Pirnie/Arcadis  
  27
- McCarthy  
  4
- MISCO  
  IFC, 6, 68, 74
- Montgomery & Associates  
  9
- Preload  
  43
- Pureflow Filtration  
  7
- Reaco Associates  
  7, 16
- Riley Industrial  
  39
- Severn Trent Services  
  46
- Stanley Consultants  
  75
- Stantec  
  75
- Statewide Disinfection Services  
  75
- Swan Analytical Instruments  
  15
- Technical Content Resource Group  
  75
- Trojan Technologies  
  56
- USA Bluebook  
  37
- Utility Service Company  
  1
- Weston Solutions  
  75
- Wilson Engineers  
  75
**CALENDAR OF EVENTS | August - December 2012**

### AUGUST

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Location</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td>TBD</td>
<td>Pretreatment Webinar: Emerging Contaminants</td>
<td></td>
<td>See page 17</td>
</tr>
<tr>
<td>25</td>
<td>Water For People, Southern Classic Golf Tournament</td>
<td>Tucson National, Catalina Course</td>
<td>See page 26</td>
</tr>
</tbody>
</table>

### SEPTEMBER

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Location</th>
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<tbody>
<tr>
<td>TBD</td>
<td>Pretreatment Webinar: Metering Station Technology</td>
<td></td>
<td>See page 17</td>
</tr>
<tr>
<td>6</td>
<td>Southern Arizona Technical Luncheon Program</td>
<td>Inn Suites Tucson City Center</td>
<td>Go to <a href="http://www.azwater.org">www.azwater.org</a></td>
</tr>
<tr>
<td>11</td>
<td>Phoenix Technical Luncheon Program</td>
<td>SRP Pera Club, Tempe, AZ</td>
<td>Go to <a href="http://www.azwater.org">www.azwater.org</a></td>
</tr>
<tr>
<td>15</td>
<td>Bowl-A-Thon (sponsored by AZ Water Young Professionals)</td>
<td></td>
<td>See page 45</td>
</tr>
</tbody>
</table>

### OCTOBER

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Location</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Sept 29-Oct 3</td>
<td>WEFTEC 2012</td>
<td>New Orleans, LA</td>
<td>Go to <a href="http://www.weftec.org">www.weftec.org</a></td>
</tr>
<tr>
<td>4</td>
<td>Southern Arizona Technical Luncheon Program</td>
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### NOVEMBER

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<th>Date</th>
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<tbody>
<tr>
<td>1</td>
<td>Southern Arizona Technical Luncheon Program</td>
<td>Inn Suites Tucson City Center</td>
<td>Go to <a href="http://www.azwater.org">www.azwater.org</a></td>
</tr>
<tr>
<td>7-8</td>
<td>Pretreatment Training Workshop</td>
<td>GateWay Community College Phoenix, AZ</td>
<td>Go to <a href="http://www.azwater.org">www.azwater.org</a> See page 55</td>
</tr>
<tr>
<td>9</td>
<td>Deadline: 2013 AZ Water Annual Conference Call For Abstracts</td>
<td></td>
<td>See page 57</td>
</tr>
<tr>
<td>13</td>
<td>Phoenix Technical Luncheon Program</td>
<td>SRP Pera Club, Tempe, AZ</td>
<td>Go to <a href="http://www.azwater.org">www.azwater.org</a></td>
</tr>
<tr>
<td>17</td>
<td>Water For People, Pedal With Purpose Event</td>
<td>Tucson, AZ</td>
<td>See page 75</td>
</tr>
</tbody>
</table>

### DECEMBER

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Location</th>
<th>Details</th>
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**We knocked them down before.**

**They set back up.**

*We must knock them down, again.*

The Bowl-a-Thon is coming this September 15.

Mark your calendars.

Save your Saturday.

---

**Young Professionals Committee Update**

The Young Professionals Committee would like to thank all those who so generously supported our annual BBQ raffle and fundraiser.

The conference may be over but we’re keeping busy. Upcoming events include the summer technical lunch presentations, Bowl-a-thon, kickball tournament and K-12 outreach.

**Upcoming Meetings**

- **July 11** – Black and Veatch
- **August 16** – HDR Engineering
- **September 12** – Stantec

All meetings are 5:30P-7:30P

To join our mailing list or for more information contact: YP@azwater.org
ALLOW ME THE OPPORTUNITY TO SHARE SOME INTERESTING FACTS AND FIGURES AND CHALLENGE YOU AS TO WHAT THESE MAY MEAN: 1 TRILLION, 85, 100 AND 174.

First, AWWA’s recent report “Buried No Longer: Confronting America’s Water Infrastructure Challenge”, identifies an astounding amount of investment required through 2035 for replacement of water mains and adding new mains for anticipated regional population growth. In short, both categories add up to just over One Trillion Dollars! By 2050, the cost for replacement and growth categories increases the estimate to an astounding $1.75 Trillion Dollars! Of course there is a significant challenge to convey these needs to customers nation-wide through strategic communication and information sharing. No doubt, the average American has little knowledge of this huge challenge, nor little time to care. The economic situation since 2008 is slow to recover and is really what is foremost on Americans minds. Regardless, established water utilities (wastewater too) across the nation will continue to face economic challenges as seldom experienced, at least since the Great Depression. For more information on AWWA’s infrastructure report and more, visit www.awwa.org/infrastructure.

Second, AZ Water Association turned 85 years young in 2012. Since 1927, this organization has followed a vibrant mission, while meeting many of the needs of the water profession. Since being a member starting in 1994, I have personally witnessed this great organization grow and thrive under the great leadership and vision of my predecessors. AZ Water Association continues to grow, in spite of being a volunteer organization. The volunteers in AZ Water – like Cindy Martinez and Annette Duarte (and countless others) – have continually demonstrated passion and dedication to this organization for many years. They should be acknowledged for their sacrifice of time to help a worthy cause. One volunteer comes to mind first and foremost - Johnny Martinez. We lost Johnny this May; I will forever remember him as the selfless dedicated individual who was kind and so respectful of others. I believe I can speak for the entire organization that without Johnny’s decades of devoting his spare time to AZ Water, we would not be the same today. He will be sorely missed by us all. Finally, I cannot move forward without mentioning AZ Water’s sole full time staff member, Debbie Muse. Debbie’s work (since 1998) for this organization, has been nothing short of outstanding. Not only does she keep people like me in line, she accounts for a major portion of AZ Water’s annual conference and making all the logistical arrangements throughout the year. There are other duties she provides that are simply too numerous to mention and she does a great job for AZ Water.

continued on page 68
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.

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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.
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john@iessouthwest.com  |  www.iessouthwest.com
I HOPE YOU ARE ALL HAVING A GREAT SUMMER AND THAT YOU GOT IT STARTED RIGHT AT THE ANNUAL AZ WATER CONFERENCE. The annual conference in May was another great experience. Dan Hood, AWWA Vice President from Indiana, attended as the national representative from AWWA. Susan Franceschi, AWWA Chief Membership Officer, also attended. Both Dan and Susan commented on the terrific technical content of the sessions, the quality of the Arizona Water people, and the great atmosphere of collaboration and fun that characterizes our conference.

Our annual conference was followed in June (10th through 14th) by the annual AWWA conference, ACE12. This year the conference was held in Dallas, Texas. I attended the conference and the AWWA Board Meeting, which preceded the conference. Arizona was also well represented by several other AZ Water members, including Charlottie Jones who was there to receive her Fuller Award, Mark Stratton, a former AWWA Director and, now a leader of the Water Buffaloes and several others. The Water Buffaloes raise funds for Water For People by riding their motorcycles to the conference from all over the US and Canada. This year they raised over $60,000. Mark bet Charlie Anderson of the Texas Section $100 that Texas could not raise as much as the Buffaloes. Unfortunately for Mark, and fortunately for Water For People, Texas raised just over $63,000, totaling just over $123,000 for Water For People - plus $100, right Mark? Over the last few years the Water Buffaloes have done a terrific job, raising about a half million dollars for a great cause. Thanks to them one and all!

Speaking of Charlie Anderson, in his inaugural speech as AWWA president, Charlie spoke of “re-engineering” the association’s business model.

“I will, in the very near future, announce a special presidential panel of key section staff, headquarters staff, and AWWA volunteer leaders to help operationalize this vision for a new business model.” He foresees partnership opportunities, such as decentralized education and training, to strengthen the organization’s sustainability in a competitive market. At the AWWA Board meeting the emphasis on collaboration and partnerships was evident as guest speakers addressed the Board from industry organizations including Matt Bond of the Water Environment Federation, Brian Good of the WateReuse Association, Jim Williams of Water For People, Charles Hilton of the National Rural Water Association, and Greg Wetterau of the American Membrane Technology Association. At the gavel passing ceremony on June 13, Charlie Anderson also pledged to safeguard the “heritage of excellence that has earmarked AWWA’s brand” and to support the initiatives undertaken by his predecessors over the past several years. Recalling his personal experience, he said AWWA had taught him to excel and lend a hand to others through his volunteer service, which he calls “the heartbeat of AWWA.” He recognized outgoing president Jerry Stevens from the West Des Moines (Iowa) Water Works for his leadership, particularly in reaching out at section meetings to hear what members had to say (a practice that will be continued by Charlie).

Charlie also emphasized the importance and benefits of diversity throughout AWWA, the Sections, and the water industry in general. I’m pleased to tell you that I have been appointed Chair of the AWWA Diversity and Member Inclusion Committee (DMIC). My appointment was effective as of the conclusion of the June ACE12 conference. The AWWA DMIC recently sent a memo to all Section Chairs calling on all sections to emphasize diversity in the officer nominating process. In the coming year the committee will take steps to reinforce this emphasis and to implement several initiatives designed to promote added diversity and recognition of diversity at the section level and at the national AWWA level as well.

At the Dallas Board meeting we also approved updated AWWA Bylaws. The Bylaws had not been revised for several years. Changes were primarily directed at getting the Bylaws current and into compliance with Illinois state laws, where AWWA is incorporated. The AWWA Policy Manual is scheduled for revision during 2012/2013, with a scheduled vote for approval at the 2014 June Board meeting.

Lastly, as of the June 10 Board meeting, the new AWWA President-elect is Jim Chaffee and the new Treasurer is Dave Rager, taking over for Lee Roberts. Dave and Lee reported that AWWA is in very sound financial condition.

Have a great summer. I’m already looking ahead to cooler days.
Town of Buckeye, AZ
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COMMUNITIES AND RESOURCE PAGES
AWWA’s online communities and resource pages conveniently align the association’s offerings into simple, topic-based knowledge centers. Resource Pages are intended to disseminate technical information and learning opportunities. Communities do this too while also promoting information exchange and other networking opportunities.

**Communities**
- Conservation
- Customer Service
- Desalination

**Resource Pages**
- Backflow and Cross-Connection Control (CCC)
- Emergency Preparedness
- Small Systems
- Asset Management

DE Salination Community
AWWA launched its new online Desalination Community at https://apps.awwa.org/ebusmain/community/desalination.aspx, the third in AWWA’s series of online communities.

AWWA members and parties outside the Association can use these platforms as a robust interface for networking and exchanging ideas. Community web pages are dedicated to resources such as news, research, discussion forums, products, tools, papers, and events.

“Each community is tailored to highlight the relevant developments and activities around a specific topic,” said Ken Mercer, AWWA Standards Engineer, who is spearheading the project. “AWWA members have been clear in what they want — quick and easy access to AWWA’s wealth of information and an area for them to learn and become professionally active.”

The online communities highlight AWWA resources, but are not limited exclusively to them. AWWA membership will afford free access to certain resources, established under existing member benefits, for which non-members have to pay. Members also receive a periodic e-Bulletin that contains a free resource unavailable on the website, such as papers and conference proceedings.

AWWA councils, divisions, and committees will provide input and guidance, but participation from all stakeholders will be encouraged, and no particular volunteer entity holds sole authority. Selection of volunteer community leaders to guide and maintain a community is made with the aim of reflecting the full range of industry activity, from practice to policy to research, local to international, and within and outside of the AWWA membership and volunteer structure.

AWWA Launches Online Resources of Four Topics
AWWA has launched four new website pages that aggregate resources on high-interest topics. The four new Resource Pages cover
- Backflow and Cross-Connection Control
- Small Systems
- Emergency Preparedness
- Asset Management

They complement the online Communities launched in 2011 that foster networking around three topics: Conservation, Customer Service and Desalination. Go to http://www.awwa.org/Resources/index.cfm?navItemNumber=1416#pages.

MORE PROFESSIONAL AND TECHNICAL RESOURCES
- AWWA Standards and Manuals of Practice.
- AWWA’s popular Career Center and the companion Work For Water program.
- Resources to support Sustainable Water Utilities.
- Water efficiency resources at the WaterWiser clearinghouse.
- Operator Assistance resources.
- Critical information for Small Systems, including the free capacity assessment tool.
- Extensive Utility Management programs and resources, including QualServe, Benchmarking, and Effective Utility Management.
- Partnership for Safe Water programs covering treatment and distribution practices.
- AWWA Technical & Educational Council resources.

ACE Online contains more than 20 hours of On-demand content selected from ACE12 sessions. To learn more go to http://www.awwa.org/Conferences/content.cfm?ItemNumber=58642.
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MONTGOMERY & ASSOCIATES
Water Resource Consultants
OUR WATER INFRASTRUCTURE IS AT THE POINT WHERE WE WILL SEE MAJOR CATASTROPHES WITH HUGE IMPACTS TO THE POPULATIONS SERVED. AWWA is publishing a document that says that we need $1,000,000,000,000 (One TRILLION Dollars) in the next 25 years.

This is $40,000,000,000 per year. For the 300,000,000 people in this country, this is $11 per month as an additional cost on just their water bill. There is no one else to pay for it, just us. We the People of this Country have to bear this cost or learn to do without water. This is over $30 per month additional cost for water per household. It does not increase quality. It does not increase supply. It does not pay for inflation. It is just to keep what we have working like it does now and it will take nearly as much for rehabilitating wastewater systems.

I would assert that the rates that we pay everywhere in this country for water is set by elected officials. They have a duty and responsibility to us, the rate payers. They mostly feel that it is their responsibility is to keep rates low. It seems to me if they do not provide sufficient funding to replace and rebuild infrastructure that is falling apart, they are failing in their most important responsibility. They are responsive to the public demands.

The public does not know the condition of their water infrastructure. Why? We have not told them. The public takes water for granted. They are not aware of what it takes to keep water coming out of the tap when they turn it on. They are not aware of what it takes to make sure that the toilet flushes and when that flush meets the stream it does not kill the fish and make the people downstream sick.

The Water Organizations need to quit competing and work together by having a common message and a common front to the Public. There will be no action on this until the public demands action. We need to raise the Public’s awareness of the value that water and wastewater services provide to their lives.

WEF is proposing that a campaign that is supported by all the Water Organizations will help the public to appreciate the value of Water. It does not have to be this campaign but it has to be a common campaign. For me WATER’S WORTH IT™ says much of what I feel about the value of Water.

ABOUT THE CAMPAIGN

What’s The Purpose?  
WATER’S WORTH IT™ is a broad-based messaging campaign that helps to answer the question about how our actions, attitudes, and the things we most value are so closely connected with water.

The campaign aims to inform a range of audiences, including the general public, media, opinion leaders, decision-makers, and elected officials.

The goals of the campaign are to:
• Demystify water and wastewater treatment by showing the direct connections between what water sector professionals do and what the public values — create jobs, protect health, protect the environment, and provide clean water.
• Expand and deepen the awareness of the value of water.
• Explain that water is a precious and limited resource that needs to be recycled and reused.
• Elevate the profile of water sector professionals by building respect and appreciation for the services they provide.
• Create a foundation of public awareness to support needed infrastructure investments.
• Support cutting-edge practices to deliver, recover, and reuse water resources.
Learn at your own pace. All you need is an internet connection.

Whether this is your introduction to wastewater treatment, a refresher course, or an intellectual stimulator, WEF’s Distance Learning training courses cover operation, design, and engineering from top to bottom. More than just a series of online quizzes, these courses offer hours of instructional material needed by wastewater professionals.

Choose from a number of fundamental and accelerated courses, ranging from 1 to 7 hours worth of content and recommended educational credit.

http://training.wef.org
JOIN THE EFFORT TO MAKE WATER VISIBLE...WATER’S WORTH IT™!

Additional resources are now available on the campaign website; deadline is extended for video contest

WEF is encouraging everyone in the water sector to join the growing number of utilities, WEF Member Associations, and other water organizations who are using the WATER’S WORTH IT campaign to help raise awareness about the value and importance of water.

To support this call to action, WEF has added new resources to www.WatersWorthIt.org, including a new 30-second PSA and five new customizable fact sheets — and has extended the deadline of the Your Voice video contest to August 20, 2012.

Launched to the U.S. water sector on March 22, 2012, WATER’S WORTH IT is an on-going, broad-based public awareness campaign that will help to answer the question about how our actions, attitudes, and the things we most value are so closely connected with water. Everyone, from water professionals to the general public, is encouraged to visit the campaign website, take the WATER’S WORTH IT pledge, and join this coordinated effort to raise awareness about the value and importance of water.

“Reaction to the campaign has been overwhelmingly positive and many are finding creative ways to incorporate the campaign into existing or new outreach efforts,” said WEF Executive Director Jeff Eger. “A number of our Member Associations have incorporated WATER’S WORTH IT into their websites and annual conferences while some utilities have included the tagline on their truck decals and postal stamps. Since the campaign is designed to either complement existing public information materials or stand on its own, the sky’s the limit on how it can be used.”

WEF is encouraging the water sector to take advantage of the free, customizable materials available in the campaign’s online toolkit at http://www.waters-worth-it.org/get-started/. The one-stop-shop resource includes fact sheets and brochures, as well as preprinted merchandise such as buttons, stickers, and T-shirts. In addition to the general WATER’S WORTH IT-themed materials, there is now a set of customizable fact sheets for the core focus areas — respect, effort, health, future and passion — and a new 30-second PSA that was debuted to hundreds of thousands of race fans who attended last month’s Indianapolis 500.

Your Voice…WATER’S WORTH IT!

To further encourage utilities and Member Associations to use the campaign and to celebrate existing efforts, WEF is holding the Your Voice: WATER’S WORTH IT video contest. Go to www.waters-worth-it.org/uploads/WWI_Video_Contest_Rules.pdf. The top videos showing how the campaign is being used in local communities will be showcased this October at WEFTEC® 2012 in New Orleans, LA.

Trivia | Questions

(FROM THE OFFICE OF THE AZ WATER ASSOCIATION HISTORIAN)

A. Many say that the two most recognized words in the world are “God” and Coca-Cola”. Those same people believe the third most recognized word is ________.

B. Date that the Louvre Museum opened to the public in Paris, France?

C. The Vietnam Veterans Memorial was dedicated in November 19__.

D. The first issue of the pictorial magazine “Life” was published on November 23, 19__.

E. The three men who combined assets to form U.S. Steel in December 1900?

SEE ANSWERS ON PAGE 33
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The City of Phoenix Water Services Department has been a leader in identifying and developing multiple solutions to cost effectively meet more stringent water quality rules and regulations. The nominal 220 million gallons per day (mgd) Val Vista Water Treatment Plant (VVWTP) located in Mesa, Arizona is no exception. With looming Stage 2 distribution system D/DBP requirements, the VVWTP facility, twice expanded since its initial construction in 1972, recently added additional tools to the City’s DBP precursor removal toolbox.

City-wide, granular activated carbon (GAC) was selected as the preferred treatment process to meet Stage 2 rules for treatment of DBP precursors and other constituents on the regulatory horizon. Initially, the GAC Implementation Project planned to convert the existing anthracite filters to GAC filter adsorbers. However, to save on GAC usage and operating costs, the City selected post-filter GAC contactors and simply optimized filtration treatment by making improvements to the existing filters and added chlorine dioxide treatment for oxidation of iron and manganese. The City’s requirements for the new GAC treatment process were to be online by the 4th quarter of 2011, not impact existing plant operations, account for a future process in the design, and be flexible enough to allow full or partial flow treatment both initially and ultimately.

Teamwork: The Guiding Principal

There were multiple challenges to meeting the City’s requirements of adding the post-filter GAC contactor process, but for the City of Phoenix, Black & Veatch and Sundt Construction, teamwork was the underlying solution to meeting the project challenges.

Meeting Owner’s Accelerated Schedule and Saving Money

The fast-tracked phased design, permitting and construction approach allowed the 220 mgd post-filter GAC contactors to be completed from notice-to-proceed (NTP) through construction and startup in just 27 months. The engineer and the City worked closely with the construction manager at risk (CMAR) to provide the most economical design, materials and methods available.

The design began with the end in mind by initially being separated into three phases so the contractor could expedite the start of work through three Guaranteed Maximum Price (GMP) packages:

1) GAC Contactor building foundation / underground and long lead equipment
2) GAC Contactor building above grade structure, ancillary structures, and additional equipment
3) Remaining ancillary structures and minor equipment.

This approach allowed for completion and permitting of the foundation and underground package in March 2010 and major equipment procurement in preparation of the contractor’s NTP April 1, 2010. Final design was completed and permitted in early July 2010. Due to progress of the design, the final two GMPs were combined near the end of design.

From day-one, value engineering was prevalent throughout the project life to save both time and money. A few examples of this value engineering contributed by all parties early in design are presented below.

- Reduced the original concept 22 single cell, 10-mgd each contactor facility (to mirror the existing filters), to twelve dual-cell, 18.6 mgd contactors during the first two weeks of design. This decision reduced not only the footprint and reinforced concrete, but also the number of actuated valves by ~40%, and maintenance costs while simplifying operations and maintaining operational flexibility.
• Used cast-in-place box conduits for influent and effluent conveyance was identified early in design and allowed the contractor to start construction of the entire GAC Contactor Building sooner, rather than waiting for fabrication and delivery of long lead, large diameter pipelines.

• Optimized trench type of pump station wetwell for the low lift pump station with a physical hydraulic model completed during design reduced the footprint by nearly 65 percent from the initial concept.

• Ensured the post-filter GAC contactor process and ancillary backwash and equalization systems had a similar “look and feel” to the existing filters and ancillary systems, including the plant control system & screens. This provided operations staff with an immediate comfort level which allowed for a smooth transition from start-up and commissioning to full plant operations.

During construction, the project team also utilized submittal workshops and reviews for major equipment systems to speed the submittal process and ultimately receive equipment to site more quickly.

Protecting the Public Health While Maintaining Treatment Operations & City Goals

Design and construction of a new process at an operating water treatment plant presents challenges where continued operations and protection of the public health are paramount. During design, a detailed hydraulic model was created to ensure the tri-fold purpose of inclusion of new GAC process without impact to existing operations, simple initiation of full or partial treatment, and incorporation of future processes.

The model was utilized to identify key minimum and maximum operating levels to allow the existing filter operation to be unaffected while maximizing downstream finished water reservoir levels from minimum plant flow to full plant operation. In addition, space – not only in the model, but also physically on the site – for a future process was incorporated such that the equipment newly installed would remain operationally unaffected.

Ultimately the success of meeting the aggressive schedule hinged upon the installation of a diversion structure into the existing filtered water channel. The project team creatively overcame the limited shutdown period for tie-in of the below-grade filtered water bypass structure by designing and building the diversion structure at the tie-in point first while ensuring extensive contingency plans to vet all possible “what-if” scenarios that could jeopardize public health or the complete reliability of the active facility.

Thanks to the teamwork of the Owner, engineer and contractor, and value engineering throughout the phased design, permitting and construction, the entire project was completed in just over two years. The project was pronounced substantially complete in November 2011 with a cost savings to the City of approximately $8 million. In addition, the engineer, working with the City, developed a computer GAC absorption model to allow operations to plan for and stagger on-line contactor operations and optimize GAC usage and further reduce future operating costs by an estimated $2 to $5M per year.
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Speaker
Shane Snyder, University of Arizona

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Contacts
Gus Lopez, 602-882-1750, Gus.Lopez@wilson-engineers.com
Shelby Dill, 480-893-8860, Shelby.Dill@wilson-engineers.com

Metering Station Technology Webinar
September 2012
1 Hour

“Overview of the latest technologies, procedures and protocols for a reliable wastewater flow metering and sampling”
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Contacts:
Gus Lopez, 602-882-1750, Gus.Lopez@wilson-engineers.com
Shelby Dill, 480-893-8860, Shelby.Dill@Wilson-engineers.com
Over the past several years, many communities have been forced to postpone critical infrastructure projects and delay needed upgrades to reduce costs. The Ak-Chin Indian Community (Community), however, undertook their largest infrastructure project ever – the Water and Wastewater Capital Improvements Project – a challenging and far-reaching project critical to the Community’s successful future growth and development. The Community, Carollo Engineers, Plateau Engineering, and MGC Contractors collaborated to achieve four major breakthroughs for the Community during the project – providing the Community with a showcase facility, which supported current initiatives and future goals.

**From farm field to showcase facility.** In only 22 months, the design team and the Community transformed an agricultural field into a critical 0.6-mgd (1.2 mgd ultimate) Membrane Bioreactor (MBR) Water Reclamation Facility (WRF) and a showcase for the Community. The MBR process provides high quality reclaimed water and the flexibility to easily and cost effectively expand future treatment capacity. The process produces Arizona Class A+ effluent, suitable for recharge and reuse applications throughout the Community. The team provided significant upgrades to, and expansion of the Community’s existing infrastructure including almost 30,000 linear feet (LF) of wastewater collection piping, 3,000 LF of reclaimed water piping, 22,000 LF of potable water distribution piping, as well as two wastewater lift stations. The WRF also includes a laboratory and a multi-purpose, 13,000 square foot Environmental Protection Department (EPD) building, which doubles as a public meeting space for Community events. To say the Ak-Chin WRF is “not your average WRF” would be a tremendous understatement. The design team and the Community spent significant time, money, and effort to ensure the facility would be a showcase in the Community and surrounding area.

**Design excellence.** With high ceiling bays, natural lighting, polished ground face block, unique terrazzo flooring designs, building fascia panels, an outdoor ramada, and other high end furnishings, the Ak-Chin WRF is a spectacular statement. Community artists were engaged to create unique designs that added a “Community” touch to the facility. Each element was carefully selected so that all visitors to the facility will appreciate the detail that was applied to the design concepts and the skilled tradesmen who worked in the water industry. While the facility includes a wide variety of high-end features, day-to-day operational functionality was the heart of the design. Every aspect of the facility was closely coordinated to increase functionality. Process areas were configured on the site to minimize required infrastructure and to closely locate process areas that require regular operator attention. The Operations Room was located on the second floor of the Membrane Building, overlooking and providing direct access to the critical membrane and UV areas. The control room provides visual access to all other process areas of the site, providing the operator with the capability of viewing chemical unloading operations, solids loading, etc. The site was also designed to provide future flexibility in functionality.

During construction, high quality craftsmanship was stressed in every detail of the facility, and Community artists were engaged to create unique designs that added a “Community” touch to the facility.
level of operation and maintenance responsibilities for the staff. Before this project could be considered a success, operations staff had to thoroughly understand and be able to efficiently operate the facility.

3D visual design tools. The design team used 3D modeling to assist in identifying and developing solutions for construction conflicts before and during construction. Conflicts were identified by using 3D models prior to construction, saving time and project funds. 3D design tools also served as an essential tool for the design team to better convey the technical and aesthetic aspects of the design to a diverse group of Community stakeholders. 3D models helped the operators to envision the size, configuration, and accessibility of the proposed water treatment facilities and equipment. Because they were fully engaged in the design, the Community embraced new and innovative technologies for the WRF. These innovative communication procedures led to international recognition and being named the Grand Award Winner for the Bentley “Be Inspired” Award in 2010.

Bridging the communication gap
While all projects seek some degree of stakeholder buy-in, this project required complete acceptance and approval from a wide variety of stakeholders including Community Council, Elders, Capital Improvements, operations staff, the Community GIS department, and the Community Fire and Police Departments. Bridging the gap between the Community's history, culture, and tradition, and their progressive thinking, growth initiatives, and desired flexibility was a challenge. Communication was critical. The team met regularly with all stakeholders through weekly meetings and dedicated workshops designed to present information in a format that was easily understood by the participants and promoted critical decision making.

Overcoming location challenges with creative solutions
With the multitude of challenges the team faced during design and construction of the new WRF, this project would not have been a success without the efforts of all team members working together to find creative solutions. Based on the aggressive design and construction schedule, the Community initially elected to utilize the Construction Manager at Risk delivery method. However, when the project plans reached a 90% completion level, the Community determined it was beneficial to proceed with a Design-Bid-Build approach. The design team worked with the selected bidding contractor to maintain the original project schedule and familiarize all team members with the project nuances. Every team member was vested in making the Community’s vision a reality from the start. Throughout the design process, the facility location was changed three times to accommodate land availability cultural resource issues. Each relocation required redesign of the process layout and offsite connecting utilities. The entire project team worked through the relocation challenges and accelerated other areas of the process to maintain the aggressive schedule without delays.

Raising the bar on innovation
The Ak-Chin WRF elevated the industry standards in a variety of ways – cutting edge technologies; green building concepts; and a multi-function facility that serves not only as a reclamation facility, but also as the Community water quality lab, EPD administration and headquarters, and Community meeting place. Reclaimed water piping around the WRF provides reuse water for fire protection to hydrants and fire sprinkler systems. Reclaimed water is also used for landscaping and is piped to each building at the WRF for non-potable uses such as service water, toilet flushing, dilution water for chemical feed systems, process and equipment spray systems, and wash down water. By using reclaimed water for non-potable uses, the Community conserves valuable water supplies and demonstrates its commitment to more sustainable use of its water resources and environmental preservation.

The Ak-Chin Indian Community is very proud of its recent growth and prosperity. Many Community members vividly remember using outhouses and hauling their drinking water from wells. Community development has rapidly changed the way of life at Ak-Chin. Today, the Community proudly owns and operates a new state-of-the-art water reclamation facility. Their new WRF and associated infrastructure plays an important role in supporting future generations by promoting continued flexibility, growth, and prosperity. The high quality reclaimed water it generates will assist in conserving the Community’s valuable water supplies to be used for agricultural production and as a source for treated drinking water. Ak-Chin’s progressive and innovative thinking, commitment to their members, and dedication to preserving the environment portrayed during the design and construction of this showcase facility was truly a breakthrough for the Community.
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SEE ANSWERS ON PAGE 75

WATER TREATMENT GRADES 1 & 2
1. What would be a normal percentage of chlorine in sodium hypochlorite purchased in 5000 gallon bulk deliveries after three weeks in a storage tank?
   A. 12.5 %
   B. 13.5 %
   C. 14.5 %
   D. Any of the above, depending upon temperature.

2. What was the feed rate in pounds per day (ppd) of chlorine gas if the dosage is 3.2 mg/L and the water production is 18.5 million gallons per day?
   A. 493 ppd
   B. 528 ppd
   C. 834 ppd
   D. 900 ppd

3. What is the backwash flow through a filter in feet per minute (fpm) if the backwash flow rate is 18 MGD and the filter measures 24 feet square?
   A. 1.8 fpm
   B. 1.9 fpm
   C. 2.9 fpm
   D. 5.0 fpm

4. How many gallons of polymer are used daily by a water treatment plant that produces 35 million gallons per day if the dosage is 0.7 mg/L and the polymer weighs 8.49 lbs per gallon?
   A. 24 gal
   B. 36 gal
   C. 54 gal
   D. 66 gal

5. What is the EPA's requirement for minimum chlorine residual of drinking water produced by a conventional surface water treatment plant?
   A. 0.2 mg/L
   B. 0.05 mg/L
   C. 0.02 mg/L
   D. 10 ug/L

WATER TREATMENT GRADES 3 AND 4
1. Which of the following chemical ions are normally found in surface waters in excess of 10 mg/L?
   A. Iron and Manganese
   B. Sodium and Chloride
   C. Fluoride and Potassium
   D. Silver and Gold

2. How much sodium hypochlorite is needed in gallons per day (gpd) to satisfy a chlorine demand of 1.3 mg/L and leave 0.8 mg/L chlorine residual when treating 50 MGD? Presume there is 1.1 pound of chlorine per gallon of sodium hypochlorite.
   A. 210 gpd
   B. 500 gpd
   C. 796 gpd
   D. 834 gpd

3. How many gallons per day (gpd) of 25% Sodium Hydroxide to increase pH of treated water when treating 38 MGD with a dose of 8.5 mg/L? Presume the Sodium Hydroxide has a specific gravity of 1.25.
   A. 1030 gpd
   B. 1525 gpd
   C. 8340 gpd
   D. 9818 gpd

4. Which of the following organisms may be present in contaminated surface water?
   A. Cryptosporidium
   B. Enteric Viruses
   C. Giardia lamblia
   D. All the above.

5. What would be the normal level of respiratory protection when handling ton containers of gaseous chlorine?
   A. Dust Mask
   B. Air Purifying Respirator
   C. Self-Contained Breathing Apparatus
   D. None of the Above.

WATER DISTRIBUTION GRADES 1 & 2
1. Which of the following is usually considered an accurate service meter?
   A. Venturi Meter
   B. Propeller Meter
   C. Nutating Disk Meter
   D. Mag Meter

2. What is the velocity through a 12-inch main if it is flowing 2450 GPM?
   A. 4.40 fps
   B. 5.50 fps
   C. 6.95 fps
   D. 8.50 fps

3. How many gallons of water are in a full reservoir that is 56 feet in diameter and is 32 feet deep?
   A. 95,842 gal
   B. 589,000 gal
   C. 717,000 gal
   D. 958,000 gal

4. How many hours would a well need to run to supply 500,000 gallons if it produces 695 Gallons per Minute (GPM)?
   A. 1.0 hours
   B. 4.5 hours
   C. 12 hours
   D. 18.5 hours

5. What is the Maximum Contaminant Level for Fluoride in distribution systems?
   A. 1.0
   B. 2.0
   C. 3.0
   D. 4.0

WATER DISTRIBUTION GRADES 3 & 4
1. What is the Maximum Contaminant Level for Arsenic in distribution systems?
   A. 0.10 mg/L
   B. 0.05 mg/L
   C. 0.02 mg/L
   D. 10 ug/L

2. How many Acre-feet (AF) is pumped from a well in one month if the well runs continuously and produces an average of 2.3 million gallons per day? Presume there are 30 days in one month.
   A. 113 AF
   B. 211 AF
   C. 435 AF
   D. 8.34 AF

3. How much Sodium Hypochlorite in milliliters (mls) must be added to a 55-gallon drum full of water to make a solution with 200 mg/L free chlorine? Presume your Sodium Hypochlorite contains 12.5 % chlorine.
   A. 333 mls
   B. 402 mls
   C. 500 mls
   D. 999 mls
4. What is the pressure in psi on a hydrant that is located at an elevation of 64 feet below another that has a reading of 44 psi.  
A. 20 psi  
B. 64 psi  
C. 71 psi  
D. 108 psi

5. Which of the following type of pipe when buried more than 6 feet deep is most difficult to locate with electromagnetic sensors?  
A. Copper  
B. Cement-asbestos  
C. Ductile Iron  
D. Pre-stressed Concrete Cylinder

WASTEWATER COLLECTION GRADES 1 & 2
1. What type of collection system may convey both storm water and wastewater?  
A. Reclaimed Collection Systems  
B. Combined Sewer Systems  
C. Storm Water Systems  
D. Potable Recovery Systems

2. Infiltration may only occur in swampy areas where force mains run through submerged ground.  
A. True  
B. False

3. If an apple floats through a manhole at 13:09:10 and then through a manhole 750 feet away at 13:25:45, what is the average velocity in feet per second (fps)?  
A. 0.75 fps  
B. 1.3 fps  
C. 2.4 fps  
D. 8.5 fps

4. Smoke testing in a manhole means lighting a cigarette to determine which way the smoke will travel.  
A. True  
B. False

5. A sewer rehabilitation technique that is done by inserting flexible polyethylene pipe into an existing deteriorated sewer is:  
A. Plasticizing  
B. Tunneling  
C. Trenchless replacement  
D. Sliplining

WASTEWATER COLLECTION GRADES 3 & 4
1. Most sewer stoppages are cleared by hydraulic surcharging.  
A. True  
B. False

2. A lift station pump lowers a 36-inch diameter well by 8 feet in 12 minutes. What is the pumping rate in gallons per minute (gpm)?  
A. 13 gpm  
B. 35 gpm  
C. 48 gpm  
D. 55 gpm

3. One critical qualification for Wastewater Collections Operators is confined space training.  
A. True  
B. False

4. While installing a new wastewater collection pipe, a trench is dug that averages 12 feet deep, 4.5 feet wide, and 150 feet long. How many cubic yards (cy) of soil are removed?  
A. 100 cy  
B. 300 cy  
C. 600 cy  
D. 900 cy

5. What is the slope of a sewer line 350 feet long with an upstream invert of 1845.50 feet and a downstream invert of 1822.25?  
A. 2.25 %  
B. 4.10 %  
C. 6.64 %  
D. 8.00 %

WASTEWATER TREATMENT GRADES 1 & 2
1. At what temperature range is the suspended solids dried in laboratory analysis?  
A. 103-105˚C  
B. 103-110˚C  
C. 50-60˚C  
D. 70-72˚C

2. How many gallons are held in a rectangular basin that is 180 feet long, 90 feet wide, and holds 15 feet of wastewater?  
A. 118300 gals  
B. 243000 gals  
C. 336000 gals  
D. 1820000 gals

3. What is the organic loading in pounds per day (ppd) to a wastewater treatment plant treating 18.5 MGD and the wastewater contains 310 mg/L BOD?  
A. 5,688 ppd  
B. 6,200 ppd  
C. 14,311 ppd  
D. 47,830 ppd

4. What is the detention time of a sedimentation basin in hours when it is treating 3.4 MGD of wastewater, and the basin measures 180 feet in diameter, and holds 18 feet of wastewater?  
A. 1.01 hrs  
B. 11.9 hrs  
C. 24.0 hrs  
D. 38.8 hrs

5. If a wastewater treatment facility treats wastewater with an average raw BOD of 385 mg/L. What is the removal efficiency if the effluent contains an average of 28.5 mg/L?  
A. 17.5 %  
B. 50.0 %  
C. 87.3 %  
D. 92.6 %

WASTEWATER TREATMENT GRADES 3 & 4
1. What size facility can a Wastewater Treatment Plant Operator run if he/she has an ADEQ Grade 4 certificate.  
A. 20 mgd  
B. 40 mgd  
C. 80 mgd  
D. Any facility in Arizona.

2. What is the surface loading in pounds per day per square foot (ppdpsf) to a basin treating 18.5 MGD with the inlet BOD of 285 mg/L and the diameter of the basin is 75 feet?  
A. 5.17 ppdpsf  
B. 6.28 ppdpsf  
C. 8.34 ppdpsf  
D. 9.95 ppdpsf

3. What are the pounds of BOD discharged from a wastewater treatment plant treating 58 MGD with an effluent BOD of 22 mg/L?  
A. 220 pounds  
B. 5800 pounds  
C. 8340 pounds  
D. 10640 pounds

4. What is the chlorine feed in pounds per day (ppd) when 8.0 mg/L of chlorine gas are used to treat an effluent of 64 MGD?  
A. 2820 ppd  
B. 8340 ppd  
C. 9934 ppd  
D. 4270 ppd

5. At what temperature is the 5-day BOD analysis incubated?  
A. 20˚C  
B. 35˚C  
C. 55˚C  
D. 100˚C

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BY TED BAILEY
BAILEYTB@ATT.NET
This Public-Private-Partnership (P3) project came about by the mutual need for major water infrastructure by the City of Phoenix (the City) and a group of high rise office, residential, and commercial Developers.

Studies revealed that a new water zone 1A needs to be created to address increased water usage and pressure demand in Zones 1 and 2A, due to commercial and residential developments in the east Camelback area. This regional solution would provide additional water infrastructure to upgrade the City’s existing system to meet the Developers’ needs as well as new and future growth of the area.

The Developers and City executed a Development Agreement on developing the estimated $23 million project in July of 2008. The Developers were the Contract Administrator and posted initial securities to fund, design, and construct the project. The City provided one designated Project Manager to oversee the design, construction, public outreach, and financial reimbursement of the project. The Developers were led by the Phoenix Office of Hines Interests, LLC, who acted as the Contract Administrators.

The project involves high levels of leadership at the City and among the Developers. The sphere of influence that the leaders possess permeates a long way into the organizations they lead and created a complex level of involvement and coordination. There was a core team of about 25 people involved in the design, which ballooned out to over 100 at peak parts of construction. The project also had extensive interactions with the neighborhoods, the development community, political officials, legal representatives and news media. The documentation, communication, records keeping and coordination was significant.

**DESIGN**

This project was designed following all the specific requirements and deliverables specified by the City. Key elements included a 16MGD (with future built-out capacity of 32 MGD) booster pump station and over three miles of water transmission mains that measured up to 48-inches in diameter. All improvements were required to meet or exceed the City’s standards. Major station components include: four constant speed pumps (2 – 4 MGD and 2- 8 MGD), one Pressure Reducing Valve (PRV) Station, suction and discharge surge tanks, a security gate, a flow meter, a chlorine residual analyzer, motor control centers, generator (back-up power), air compressor, automatic transfer switch and switchgear, sound/perimeter wall, landscaping, irrigation, and underground infrastructure for future upgrades.

**VALUE ENGINEERING**

The design included an independent evaluation and value engineering of the recommendations from previous master plan report determining the need for these facilities. One key component included the need to acquire the site for construction. Since the Developer Coalition was the lead agency for the project, the site selection and locating process was their responsibility. As part of the design, several potential sites for the booster pump station were identified to provide options to keep the project on schedule. The site selected was near the northwest corner of Indian School Road and 20th Street, in a more efficient location than was previously proposed and allowed for a more efficient layout of the new 20-inch to 42-inch delivery lines. The City acquired the site once it was identified.

Another key value engineering outcome was the ability to provide security and noise attenuation with site layout and wall height. The original concept had anticipated the need to provide the station within an enclosed building. After a detailed analysis of the existing and anticipated noise conditions, it was determined that placement of the pumps on the western most portion of the site had the advantage of the acoustical properties of the adjacent structures, therefore no building was needed. The operators were happier to have greater access flexibility and lower maintenance issues. The final noise test proved the anticipated calculations to be accurate and confirmed that the sound attenuation was achieved. This value engineering suggestion / value added feature resulted in a better performing facility that was approximately $1 million less in initial capital cost per Hunter Contracting’s construction cost model. Just
one of many value engineering enhancements on this project that resulted from the collaboration between the City, the Developers, and the rest of the Project team, ultimately resulting in better performance for less cost.

**CONSTRUCTION**

**CMAR Delivery Method** - At the heart of this project was the decision to use Qualification Based Selection (QBS) not only for the design element but also for the delivery of construction under a Construction Manager at Risk (CMAR) Method. While the City of Phoenix provided full support and resources as the Municipal Partner in this P3, Hines Interests, LLC, as the Contract Administrator for this project, completed all design and construction utilizing QBS as defined in Title 34 in the Arizona Revised statutes. They went through the procurement process and selected Hunter Contracting to be their CMAR. Hunter provided complete pre-construction services and construction management during construction.

**Entellus’ Construction Roles** – Entellus provided full time construction administration for the Construction Administrator. The City hired Brown and Caldwell to provide construction oversight on their behalf. The Contractor Administrator and the City played the key role in public outreach with the help of Kathleen Darr and Associates (KDA) and the project team. Public meetings were held as well as specific meetings with the adjacent property owners before, during, and after construction. Regular project newsletters and communications were prepared and distributed. Hot line was established throughout the project.

**Start-up and Commissioning** – The CMAR (Hunter) and Entellus jointly developed a detailed start-up and commissioning plan that was thoroughly reviewed and ultimately approved by the City. The plan included every preliminary individual and dynamic on-site check that could be completed on-site in an innovative and cost effective way.

One unusual technique that proved a great success on the Booster Pump Station (BPS) was installing a by-pass pipeline with a multi-purpose globe valve. The valve was used in two ways: as a pressure differential valve during construction and ultimately as a pressure relief valve. This completely reduced the risk to customers or the environment during station testing and saved considerable cost. Its ultimate use as a pressure relief valve is a critical component of the surge system.

Another BPS innovation during start-up was the introduction of a PRV station, for pressure stabilization of the discharge manifold, to mitigate system pressure fluctuation due to various demands at different time. The solution utilized a future pump location to install a two stage double pressure relief valve. This PRV station was designed and assembled by the City. This device worked perfectly, immediately upon start-up.

The entire station was tested and “rung out”, including allowing for long duration run times to verify on-site pump reliability, prior to being placed into commissioning.

The BPS station was built before the new water zone 1A was created. There were no reservoirs in adjacent zones to provide flow-equalization during the commissioning. In addition, the BPS station needs to be put into the City’s operation services on the first day of the commissioning. Before the commissioning, the City conducted a thorough in-house modeling and planning. The City predicted flow direction change in the system and developed impact area map. The City also developed an internal contingency plan, on how to respond to different emergencies during the commissioning. On the first day of the commissioning, the City dispatched staff along east Camelback Road and successfully intercepted the system turbidity caused by the flow direction change. No customers were affected.

**Results** - In the end, the net results were astounding. Not only was this project considered a success by the City and the Developers, it set a precedent as to how P3’s can be successful.

**The project:**
- Was completed 8 months ahead of the stipulated contract deadline,
- Was completed at a cost of approximately $16m ($7m and 30% under original $23m budget)
- Passed the rigid City of Phoenix 30-day commissioning with no failures or restarts A FIRST

**The Project Team included the following key team members and roles:**
- City of Phoenix, Owner/Client
- Hines, LLC , Owner/Client
- Entellus, Inc., Lead Design Firm
- DarCor, Electrical Design and Inspection
- Ninyo and Moore, Geotechnical Design and Testing
- Nabar Stanley Brown (Gannett -Fleming), Structural Engineering
- Brown and Caldwell, Third Party Technical Reviewer
- Hunter Contracting, General Contractor
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It’s time to reserve your spot for the Monthly Technical Luncheon Door Prize Sponsorship. Sponsoring companies will be recognized each month at our AZ Water Technical Luncheon events in Phoenix and Tucson by providing a door prize and a nominal contribution to support our program.

This season’s meetings will be held September 2012 through April 2013. See AZWater.org for the upcoming events and topics. Don’t miss your chance!

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For more information about our Door Prize Sponsorship Program, please contact our coordinator:

Lisa Snyders  
Carollo Engineers  
4600 East Washington Street, Suite 500, Phoenix, AZ 85034  
lsnsyders@carollo.com or 602.263.9500

Please indicate which location you would like to sponsor and send checks payable to “AZ Water” and your gift certificate/card to Lisa Snyders. You can select either location to participate in, or both! Luncheons are held at the following locations:

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**Tucson**  
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Developed by the WEF Collection System Committee
The Lake Havasu City Wastewater System Expansion (WWSE) Program has been honored as the Arizona Water Association’s 2012 Wastewater System Project of the Year Award for its role in protecting the community’s groundwater by connecting the residents to a new community sewer system. “With an economy heavily dependent upon tourism, boating, and fishing, Lake Havasu City understands the importance of good water quality,” says City Engineer Greg Froslie, PE. “The program helps significantly reduce the amount of pollutants reaching the endangered Lower Colorado River, which supplies drinking water to more than 25 million residents.”

Laying the Groundwork for the WWSE Program

Previously, the City relied mainly on septic tank systems to treat and dispose of wastewater. When bacterial contamination in Lake Havasu spurred an Arizona Department of Environmental Quality (ADEQ) investigation after beach closures in 1994, this system was found to be inadequate for safely protecting water resources. The septic tanks, located directly uphill from the lake, were identified as the culprit.

Burns & McDonnell devised a wastewater master plan in 1998 (updated in 2001) to convert 22,000 residences to a centralized wastewater collection system. A 2001 study concluded that septic tanks in Lake Havasu City were contributing to the accumulation of approximately 300,000 pounds per year of nitrates to the groundwater. The proposed wastewater collection system would reduce this figure considerably, helping to eliminate contamination from Escherichia coli bacteria and nitrate pollution, which provides the bacteria’s nutrient source.

In November 2001, voters approved by a 78 percent margin a $463 million bond to implement the WWSE program.

Embracing the 10-Year Journey

The City broke ground on construction of the first WWSE project in September 2002, and the program was substantially completed by November 2011. The program’s final cost was $348 million, more than $100 million under budget.

In all, the massive, 10-year program included constructing 274 miles of new gravity main and 286 miles of sewer lateral pipe in an existing built-out community, tearing up and restoring a whopping 70 percent of the city’s residential front or back yards, repaving nearly all (91 percent) of the city’s streets, siting and constructing a new treatment plant (after the City evaluated more than 150 potential properties), and constructing more than 30 community pump stations. More than 20 contractors were employed throughout the course of the program.

The unearthing of streets offered an opportunity to upgrade existing utility infrastructure. The gas company repaired or replaced nearly all of its lines due to age and/or problems identified through construction. The project also involved replacing 15,253 water services and 28,675 feet of mainline water pipe.

The program was implemented in an existing, developed community, requiring creation of the Partial Engineers Certificate of Completion (PECOC) process in coordination with ADEQ. This was the first project in Arizona to use the PECOC process, which allowed homes to be connected to the sewer system as the project was completed. Prior to this process, no
homes could have been connected to the main until the entire system was installed.

**Overcoming Project Challenges**

Because the existing septic tanks were located on 22,000 private properties, one project challenge involved excavating streets and yards to connect the new infrastructure.

“Our options to solve Lake Havasu’s water quality issues were limited. ADEQ intended to place a moratorium on citywide development until a sewer system was constructed, which would have been detrimental to the City’s economy. Delay was not a choice,” says Froslie.

The program team cost-effectively managed the WWSE solution by adjusting specifications every year to refine technologies and techniques that would help the program succeed. Standard specifications were refined after each individual area was constructed, and issues encountered with the specifications or with the community were addressed and resolved.

A significant portion of construction occurred during the intense Lake Havasu City summers, when daily temperatures routinely exceed 100 degrees Fahrenheit. Construction crews stayed sun-safe with required shade breaks and constant hydration. Monsoon season and flash flooding also created adverse conditions at job sites. The field inspector ensured that excavations were backfilled prior to storms and monitored equipment and staffing to move them from flash flood areas when feasible.

Through flexibility and effective coordination, the City successfully managed the many parties involved in the WWSE program. The City developed a program database, which was updated daily, to house all project data and correspondence between City staff, the program manager, and residents. Additionally, throughout the 10-year project duration, four city managers and four mayors served Lake Havasu City—including one recall election directly attributed to this project.

The City’s management techniques led to the program’s completion under the initial estimate, even though construction costs were significantly increasing in the early 2000s.

**Using Creative Construction Methods to Create Cost Savings**

Asphalt prices required creative planning for street construction. Since the program’s construction occurred largely under existing streets, the city needed to repave nearly 5 million square yards of asphalt roadway. Skyrocketing oil prices in the mid-2000s posed a challenge for contractors to bid asphalt for projects lasting up to 1 year. The City’s solution involved allowing the contractor to bid asphalt at a set price given the current cost of oil, with an agreed-upon adjustment as oil costs rose or fell. This system minimized risk for the contractor and ultimately reduced costs to the City by more than $500,000.

In addition, the construction manager-at-risk method provided a cutting-edge, cost-effective approach for construction of the new 3.5-mgd wastewater treatment facility as part of the WWSE program. By using this process, the City was able to purchase equipment separately, thus avoiding cost increases.

Curvilinear sewer main construction reduced the estimated number of manholes from approximately 9,500 to 4,250 — representing roughly $16 million in savings. The final manhole count reflected in the as-built drawings is 3,981. Due to the curvilinear streets, it was more cost-effective (and as easy to maintain) to install the sewers on a curve, thereby reducing the number of manholes.

To take advantage of a competitive contractor bidding environment, the City expedited design and construction of two sewer areas near the end of the program. This method enabled the program to be completed in 2011, 2 years ahead of schedule and significantly under budget.

**Looking Forward to a Future of Clean Water**

From driving through construction zones to enduring construction on their own doorsteps, every resident in the city was affected by this massive, long-term program. The overwhelming majority of Lake Havasu City voters who supported this project understood the crucial need to create a healthier supply of drinking water for the community.

“It’s hard to describe just how big of an impact the Wastewater System Expansion Program has had on our city,” says Lake Havasu City Mayor Mark Nexsen. “In spite of many challenges, our staff and the engineers took a very invasive project and got it done under budget and ahead of schedule. As a resort destination, our city depends on the health of the Colorado River, and this project’s successful completion has had a significant influence.”
TUCSON WATER ANNOUNCES NEW DIRECTOR

Alan Forrest began his duties as Director of Tucson Water on Monday, June 4, 2012. He brings 27 years of experience in public utility operations and management to Tucson Water employees and customers.

Starting in 1985, Mr. Forrest spent the first nine years of his professional career at Tucson Water where he served in various engineering positions, ultimately serving as Chief Planning Engineer. He then gained additional experience at three area water utilities, including serving nine years as Director for two local water companies. The last seven years have been spent as Vice President and Area Manager for a Fortune 500 consulting and engineering firm, managing its Tucson office.

Mr. Forrest will work closely with the City Manager’s Office to ensure that important water policies and goals established by the Mayor and Council are implemented. “It is my goal to ensure long-term water reliability, and that we continue to deliver quality water with a high level of customer service,” he states. “I look forward to working again with Tucson Water’s professionals, and together, serving our customers at one of the finest water utilities in the nation.”

MCCARTHY BUILDING COMPANIES VP PROMOTED TO BUSINESS UNIT LEADER

Frank Scopetti, Senior Vice President of McCarthy Building Companies, has been promoted to the position of Business Unit Leader of the Water Services team in the Southwest Region. Scopetti replaces Bob Knochenhauer who led the Water Services team for more than 10 years. He recently retired from McCarthy after a 40-year career.

In this role, Scopetti is responsible for all aspects of the Southwest Region’s water/wastewater treatment plant projects and serves as team lead on some of the largest and most complex projects in Arizona, Colorado, New Mexico, California and Texas. Scopetti joined McCarthy in 2006 as Vice President of Mechanical Services. Recently, Scopetti was selected to participate in McCarthy’s Advanced Leadership program, the company’s in-depth leadership training program designed to prepare select.

Scopetti has professional and community affiliations with the Arizona Water Association, Association for Construction Excellence (ACE), and he served as the chairperson for the Design Assist Task Force-Services and Deliverables. He currently serves on the board of advisors for the Construction Industry Institute.

The Scottsdale resident holds a bachelor of science degree in mechanical engineering from Penn State University as well as a bachelor’s degree in business administration from Indiana University of Pennsylvania. He also serves on the board of directors for the newly formed Elite Service-Disabled Veteran Owned Small Business Network-Arizona Chapter (Elite SDVOSB-AZ).

MCCARTHY BUILDING COMPANIES CONSTRUCTING WATER AND WASTEWATER FACILITIES AT THE TWIN ARROWS RESORT & CASINO OUTSIDE FLAGSTAFF, AZ.

The Tempe-based Southwest Region of McCarthy Building Companies Inc. (www.mccarthy.com) recently began construction on the $7.1 million design/build water and wastewater facilities for the Twin Arrows Resort and Casino east of Flagstaff, AZ. The Twin Arrows Casino is currently under construction and is being developed by the Navajo Nation Gaming Enterprise Board.

Led by McCarthy’s Tempe-based Water Services team, the comprehensive water project includes a master plan to specifically serve the Twin Arrows Resort and Casino and planned future amenities, including a potential golf course. McCarthy’s design partner is Scottsdale-based WaterWorks Engineers.

McCarthy is installing 17,500 linear feet of water and wastewater pipes, a pump station with a storage tank for the casino’s potable water supply, a wastewater treatment plant, two wells and facilities to house the control room and electrical and pumping equipment necessary for the project.

“McCarthy has a long history of working with tribal communities in the Southwest on projects like the Twin Arrows Casino,” said Frank Scopetti, Vice President of McCarthy’s Water Services team. “Our design/build team for this project is working closely with the Navajo Tribal Utility Authority to ensure their water needs are met now and in the future.”

The Twin Arrows Casino is poised to be a major gaming facility with a 90-room, 4-star hotel and conference center, located near the Twin Arrows exit off of Interstate 40 between Flagstaff and Winslow, AZ.

McCarthy and WaterWorks Engineers were selected as the design-build team for the project. The water/wastewater facilities for the casino will be completed in early 2013 with an April 2013 estimated completion of the casino.
DN TANKS ANNOUNCEMENT

DN Tanks designs and constructs prestressed concrete liquid storage tanks. The hallmarks of our work are long-term performance, durability, reliability, minimal maintenance requirements, and lowest cost of ownership. We specialize in the design and construction of AWWA D110 tanks that meet varying project requirements with the ability to withstand seismic activity, extreme climates, and severe site conditions.

DYK Incorporated and Natgun Corporation joined forces as the two most respected builders of prestressed concrete tanks. The resulting entity, DN Tanks, has more than 130 years of combined experience and a project portfolio that spans throughout the U.S. and Internationally. The merger of the two companies has resulted in expanded construction capacity, unmatched technical expertise, and proficiency in multiple types of proven tank designs to provide customized liquid storage solutions.

Although we have built literally thousands of tanks, the ultimate measure of our success is our commitment to quality while providing the absolute best service to our customers. This ensures best long-term value and has earned us our reputation as the industry leader.

Our mission is to provide our clients around the world with the highest quality liquid storage tanks at the best long-term value with unsurpassed customer service and satisfaction. It’s our commitment to quality, durability, and delivering long-term value that lasts for generations.

Shown above is the completed 0.50 MG "Wellsite No. 86" tank in Scottsdale, AZ.

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**PRESIDENTS**

Incoming President Chris Hill (L) presents a Kachina and Service Awards to outgoing President Kevin Conway.

**BOARD SERVICE AWARD**

Thank you Dan Lueder, City of Cottonwood, for your service on the Board from 2009-2012. Also receiving an award was Jason Vernon from Coombs Hopkins (not pictured).

Dan Lueder, Board Member 2009 – 2012.

AZ Water Board Meets during Annual Conference.

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Tucson, AZ 85711
Tel: +520.514.9835

ch2mhill.com
The Arizona Department of Environmental Quality is seeking about 15 members for a panel being formed to examine emerging contaminants and develop approaches to ensure the continued safety of the state's drinking water.

The Advisory Panel on Emerging Contaminants will survey new chemicals and pathogens that threaten the continued safety of drinking water like chemicals from pharmaceuticals and personal care products and pathogens like the Naegleria parasite, Legionella bacterium and Hepatitis A virus. The panel will provide a forum for the open discussion and prioritization of emerging contaminant issues of critical interest to Arizona.

“This is an important panel that will assist in ensuring the continued safety of our drinking water,” said ADEQ Director Henry Darwin. “We are looking for volunteers working in state and local government, drinking water utilities and state universities to help us in this task.”

Anyone with expertise in emerging contaminants and interest in being appointed to the panel can send a resume to ADEQ Senior Hydrologist Chuck Graf at cgg@azdeq.gov or by mail to Chuck Graf, Senior Hydrologist; Arizona Department of Environmental Quality; 1110 W. Washington Street; Phoenix, AZ. 85007. The deadline for ADEQ receiving resumes is July 30.

The panel is expected to begin its work in early September and meet four or five times a year.

In 2010, Gov. Jan Brewer’s Blue Ribbon Panel on Water Sustainability recommended that the occurrence and threat of emerging contaminants be more fully examined to insure that the state’s water supplies remain safe.

Among the goals of the emerging contaminants panel are to prioritize the most problematic contaminants, promote research on them and provide operational guidelines for minimizing risks to Arizona’s drinking water supplies.

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**Trivia | Answers**

*(FROM THE ARIZONA HISTORIAN ON PAGE 12)*

A. Titanic sunk at approx. 2:20 am on April 15, 1912 - 1517 people lost their lives. Origin of the word “titanic”: The word means great force and power. It comes from the Greek word, Titans. The Titans were powerful giants who were the parents of the Greek Gods.

B. Nov 8, 1793. The Louvre collection of art was initially begun as a “private” collection – in 1546 by King Francis I. Each subsequent monarch added to the Louvre and its collection. After the French Revolution, the Louvre was opened to the public.

C. 1982.


E. Charles Schwab, J. Pierpont Morgan and Andrew Carnegie. They combined several steel companies into one to form U.S. Steel.
As the sun sets the inhabitants in the site settle down for the day; strategically placing themselves to avoid disturbance or much worse, predation. The hunters of the dark begin to stir as their night shift begins, each equipped with specialized tools to help them survive. The accepted rule is the big ones prey on the small ones and such is the natural design of the food chain, but it is important to remember there are always exceptions to the rules.

Tres Rios is strategically located to rehabilitate a region that was historically a natural wetland/riparian site. It is located at the confluence of three rivers that just happen to meet at the lowest lying spot in the Phoenix metropolitan area. Originally it was a location with navigable river channels and life a plenty. Progression by settlements in and around the city made demands on resources of the area and forever changed the river’s character.

I am reminded of the old saying; everything blessed with beauty also has a dark side; that remains true with Tres Rios. The beauties of the environment and nature also have some unseen dangers, and one of the most significant is mosquitoes. While in the process of extracting a blood meal from a victim the female mosquito can also transmit pathogens. This presents a dilemma that is not easily remedied because the mosquito in its many morphological forms contributes greatly to the overall ecology of the system.

There is a fine line between an environmental wonder and an ecological struggle. This is easily illustrated when looking at the food chain development within a system like Tres Rios. Mosquitoes play an intricate part in the lower trophic levels of the food web (an interrelated food chain) and higher order organisms rely on them in a predator to prey relationship. Disturbing the lower level populations in a food web usually has a domino effect upwards and unfortunately the first to recover are usually the mosquitoes. This creates a vicious cycle of attempting to eradicate the mosquitoes, thus creating imbalance of prey to predator ratio; predators disperse from lack of resources with a subsequent re-establishment of nuisance mosquito population.

There is also a fine line between the ecological struggle and public health. Regulatory interactions on the subjects of mosquito control and public health are as vast as the list of regulatory agencies involved. You might imagine how delicate the situation is when dealing with mosquito populations in aquatic environments. Each agency involved has a system of checks and balances that ensure public health concerns are addressed while protecting the environment. To list a few:

Environmental Protection Agency (EPA) – Primary agency responsible for enforcing various environmental statutes and regulations of the United States.

Arizona Department of Environmental Quality (ADEQ) – Authorization from the EPA for the Arizona Pollutant Discharge Elimination System (AZPDES), Pesticide General Permit (PGP).

Arizona Department of Health Services (ADHS) - Provides guidance and authority on arbovirus monitoring and reporting.

Arizona Department of Agriculture/ Office of Pest Management (ADA/OPM) – Provides guidance and regulatory authority for pesticide use, handling and licensing.

Maricopa County Vector Control (MCVC) – Provides guidance and regulatory authority on mosquito control and production prevention.

City of Phoenix Environmental Services Division (ESD) – Provides interaction and interpretation for the client to the regulating authorities.

Mosquito control (vector control) activities at Tres Rios started many years back with the original Demonstration Facilities. While starting up the project we quickly became unpopular among some of the agencies concerned with public health. We were put on a “bad actor” list and had to develop a vector control strategy or risk closure and possible fines. Our initial mandate with the Demonstration Project was water quality exclusively, so the learning curve on how to deal with mosquitoes was pretty harsh. We quickly realized the relationship of desirable water quality to mosquito production and later how the permitting practices would encompass both.

The first lesson I learned in my mosquito quest was turbid water helps in mosquito production and the larvae stage is the single best point to interact if population controls need to be utilized. Mosquito larvae use the debris in water as a food
source to develop and that is why most mosquitoes (there are exceptions) prefer detritus heavy, backwater areas. These areas also tend to be calm promoting better survival rates for the transition out of the pupae casing to the winged adult.

To monitor the mosquito production activities, first an operator does a little wilderness exploring around the watershoreline with what is known as a larva dipper. This is basically a cup secured to the end of a broom stick. This allows you to reach through the vegetation into the water and see how many and what stage of larvae may be present within the system. It is very important to have an operator who is able to identify and categorize what they are seeing; this observation creates an assigned numerical value that dictates application rates of larvacide if needed later.

Adult populations are also monitored. This activity is sort of like fishing, but the quarry is a female mosquito. Mosquitoes have specialized olfactory receptors that are tuned into the respiration of carbon dioxide (CO₂); yes, it’s true, to a mosquito you smell delicious. Using this principle we attract them with dry ice in a bucket suspended over a fan and catch net. As the ice degrades it releases CO₂ gas, and as the mosquito comes looking for dinner, they subsequently get sucked in by the fan and trapped in the catch bag. The catch is then enumerated and identified. Each species of mosquito has different habitual preferences and that aspect can be valuable for control.

It is important to note the female mosquito bites you looking for blood to develop her eggs and it is at that very moment when the public health problem presents itself. There is an exchange of fluid, that helps suppress blood coagulation, which can carry a variety of pathogens. Control for vectors is best carried out long before adult morphology is reached, in the water, at the larval stage.

Sometimes the best way to control a problem is to let nature take its course and take a support role. Natural control is not only desirable; it is beneficial for diversity within the food web. The more tiers that can be added to the food web the more chances a system can have resistance to upset. One of our most powerful tools for mosquito control is a little mosquito fish called Gambusia affinis. Although spiders, birds, bats, etc. have an impact and interrelation to the overall balance these little fish make a huge impact. Their main diet menu is focused at an impact and interrelation to the overall balance these little fish are not chemical or biological. While using best management practices, the final desired outcome is what drives the actions taken. Mosquito populations, equipment, control agents and even staffing are considered in the decision matrix that helps determine the course of action in the control program.

The equipment collection for applying control agents has become very specialized as the program has matured. Getting the most effective control measures at a sensible cost has really driven us to be innovative. Equipment like a hydroseeder is used to create an aqueous solution to apply granular agents and an airboat provides access into difficult areas for thorough treatment. When reflecting on the methods of the past it is obvious how far the program has evolved.

Specialized control agents have kept pace with the equipment technology providing more environmentally friendly outcomes. When considering which control agent to use, situation effectiveness is always considered. Many control agents have specific mechanisms of influence that can be exploited for effectiveness or reduced application cost. A good control program always has a cost associated with it, but that cost can be minimized by thinking first and then taking action.

The applicators applying the control agents are probably the most important link of the whole program. If you think about it they are the on the ground decision makers and can influence program failure or success. An applicator is required to hold a certification in a relevant category to which they are involved and are listed as part of the operating staff in regards to the PGP. I am very lucky to work with highly qualified individuals who are committed to a successful, cost effective vector control program that promotes ecology and public health.

A constructed wetland is designed with the intention of mimicking a natural system’s best qualities and attributes. With that being said, a natural system will always have a design advantage; an innate collection of natural phenomenon that achieve an environmental balance. Most naturally occurring wetlands are positioned in an area where everything comes together in a symbiotic situation and almost all of the inhabiting organisms have a relational purpose of existence. Conversely, engineered wetland systems must use designed features to promote effective management while operating. I guess the real trick to success in vector control of a wetland is achieving environmental balance, and then look at what can be controlled.

This article is part three of four articles that will appear this year in the AZ Water Kachina News.
MOST HISTORIANS BELIEVE THAT THE TRUE ROOTS OF SEWERS GO BACK TO 3500 BCE TO THE CITY OF MOHENJO-DARO/INDUS RIVER VALLEY (NOW IN MODERN DAY PAKISTAN). The first sewers were open-topped (rectangular or square in cross-section) drains made of cut stone or manmade masonry units. They were created to more effectively collect and convey storm water away from the residential areas and out to the Indus River. On “day one” those sewers were “storm sewers”; on “day two”, they became “combined sewers”. In those days and for many hundreds of years thereafter, household and human wastes were often disposed of by throwing them into the street and waiting for the next rainstorm event to flush the wastes off the street, into the open topped drains then into the nearest body of water.

During the next 5600 years of the evolutionary development of sewage conveyance systems, mankind fine-tuned the design, construction, and operation/maintenance of what is now recognized by many to be one of the greatest achievements/improvements toward the betterment of people’s health, wellbeing, and welfare. Along the way, however, some “used” sewers for purposes that were in effect counter-productive and oftentimes dangerous!

As the “Industrial Age” evolved in the US, certain liquid by-product wastes were created. The easiest (and, often times the least expensive) way to dispose of those wastes and convey them away from the manufacturing facility/property was to flush the wastes into the local sewer system. Early on that meant the wastes went to the nearest water way (note the similarity with practices of 3500 BCE) and, later, the wastes went to downstream wastewater treatment facilities. Aside from the damage sustained by the receiving waters, sometimes significant and sudden physical damage was impacted upon the involved sewers (proper) and adjacent properties. One prime example of such potential damage/disruption was the Louisville (KY) Sewer Explosion event of 13 Feb 1981. Over two miles of one of Louisville’s combined sewers (12’ dia), adjacent utilities, streets and private buildings and homes were either destroyed or significantly damaged. Many of the adjacent building’s toilets suddenly became fountains of sewage. Luckily, no one was seriously injured because the event occurred at around 5:00am on a Friday morning. The cause was the discharge (albeit and reputedly, accidentally) of hexane, a solvent used by the upstream Ralston Purina soybean processing plant. The vapors from the hexane accumulated in manhole structures along the sewer’s route. A spark from a car disturbing one of the involved cast iron manhole covers ignited the hexane. The resulting explosions was likened to that of a bombing run during WW II. It took over twenty months to rebuild the sewer and, thereafter, several more months to replace the damaged surface infrastructure. Ralston Purina paid over $18 million in damages.

The good that has come from such incidents has resulted in a greater awareness of the possible ramifications of industrial wastes being simply discharged into sewers, the adoption of hazardous waste ordinances, and the implementation of industrial wastewater permitting and monitoring practices - not only in Louisville, KY; but throughout the United States.

The following photos will help to illustrate the degree of damage sustained from the 13 Feb 1981 sewer explosion incident.

“Whatever man has created throughout history tends to be misused at times!”
The Louisville Sewer Explosion is one of hundreds of such incidents (small and large) that have occurred. Examples of what can happen if sewers are either misused, do not receive the respect they should or, some combination thereof.

These pictures are but a few of the many events involving the improper use of sewers during recent history in the United States wherein the results have caused the loss of lives, the release of sewage to the environment and/or significant property damage. Regrettfully, as long as “humans” remain involved with the operation, maintenance, management and/or administration of our nation’s public sewers and, of the involved connected homes/businesses/industries; there will remain some likelihood of such events occurring again. With the ever-increasing level of maintenance/inspection of sewer systems and of the regulation/monitoring of the content of the sewage being discharged to our sewers; any such re-occurrences may well be minimized accordingly and, should help to keep history from repeating itself!
Now is the time to submit your best shot!

Photography, like art, is meant to capture a moment, convey a feeling and tell a story. Arizona has many beautiful water features and AZ Water would like to use photos for its publications including a 2013 calendar.

Photographers are encouraged to submit their original work by August 31, 2012 for consideration. Selected photographs will be used in a calendar that benefits the AZ Water Scholarship Endowment fund.

Photos submitted may show treatment processes as long as the photo cannot be used to identify a given facility. Photographers are responsible for obtaining permission for photos taken and submitted.

Photos will be evaluated by a team of volunteer judges, there are no fees to enter. Take the time and submit!

For more information and to submit photos, please email:

AZWaterPhotos@gmail.com
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Member: AWWA, NRWA, SSPC, NACE, Various State Water Associations & Municipal Leagues
I recently heard a presentation from a speaker named Dr. John Maxwell about “Using Time or Abusing Time”. I would like to share this two part article and some of his thoughts with you. Remember that “You cannot kill time without injuring eternity,” ~ Henry David Thoreau.

People That Abuse Time Continually…

1) Do things that other people want them to do. And this diminishes their uniqueness.

“Time is the most valuable coin in your life. You and you alone will determine how that coin will be spent. Be careful that you do not let other people spend it for you,” ~ Carl Sandburg.

It has been said that the people with nothing to do usually want to spend their time with you! Check out your calendar and see who may be taking up too much of your time.

2. Do things that are not Important and this keeps them from being Effective.

“It is not enough to be busy.” The question is, “what are we busy about?” ~ Henry David Thoreau.

Prioritizing Your Tasks

Use this formula to help you rate the task in terms of importance.

Critical = 5 points
Necessary = 4 points
Important = 3 points
Helpful = 2 points
Marginal = 1 point

Now decide how urgent it is.
This month = 5 points
Next month = 4 points
This quarter = 3 points
Next quarter = 2 points
End of year = 1 point

Multiply the rate of importance times the rate of urgency.

For example: importance 5 (critical) X urgency 4 (next month) = 20.

Scale the results.
A = 16-25 critical to finish by the end of the month
B = 9-15 important to finish by the end of the quarter
C = 1-8 tasks are low priority

3. Do things that can be done better by others. This makes them average. Nothing is changed by mediocre performance.

Questions to Ask About Your Competition

1. Is someone else doing what I am doing?
2. Are they doing it better than me?
3. Can I become better than them?
4. If I become better, what is the result?
5. If I do not become better, what is the result?

4. Do things without good coaching or training and this reduces their potential.

“The only thing worse than training employees and losing them is not training them and keeping them,” ~ Zig Ziglar.

A recent study of 3,200 U.S. companies conducted by Robert Zemsky and Susan Shaman of the University of Pennsylvania showed the following:

A 10% increase in spending for training led to an 8.5% increase in productivity.
A 10% increase in spending on capital expenditures led to only an 3.8% increase in productivity.

Most management experts agree that traditional seminars have their place, but that most learning takes place back on the job through actual job assignments, or through “action learning” which is experiential exercises aimed at solving real-life problems that have immediate relevance to the company.

Noel Tichy observes that “winning leaders ... push people not just to memorize the organization’s values but to wrestle with them, to internalize and use them.” He advocates putting people “in progressively more difficult situations where they have to make decisions, and then give them feedback and support.”

Jay Conger adds that “challenge, hardship and derailment,” if experienced at the right time and in the right amounts, also creates and strengthen leaders.

Burt Nanus and Warren Bennis believe that “nearly all leaders are highly proficient in learning from experience,” and Morgan McCall observes that “it’s what a person has to do, not what he or she is exposed to, that generates crucial learning.”

5. Do things without thinking and this causes wasted time and energy.

“The major difference between achieving people and average people is how they think,” ~ Thinking For a Change.

“You are today where your thoughts have brought you. You will be tomorrow where your thoughts take you,” ~ James Allen.
How to Think Better and More Often

- Find a place to think your thoughts, and take time to think.
- Find a place to shape your thoughts, and take time to think.
- Find a place to stretch your thoughts, and take time to think.
- Find a place to fly your thoughts, and share with your trusted team.
- Find a place to land your thoughts, and take a chance.

6. Do things with wrong motives. This increases conflicts with self and others.

“One of the most time-consuming things to have is an enemy.” ~ E. B. White.

<table>
<thead>
<tr>
<th>People with Right Motives</th>
<th>People with Wrong Motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everyday are Preparing</td>
<td>Everyday are Repairing</td>
</tr>
<tr>
<td>Lets You Focus on Today</td>
<td>Makes You Focus on Yesterday</td>
</tr>
<tr>
<td>Increases Efficiency</td>
<td>Consumes Time</td>
</tr>
<tr>
<td>Increases Confidence</td>
<td>Breeds Discouragement</td>
</tr>
<tr>
<td>Saves Money</td>
<td>Increases Cost</td>
</tr>
<tr>
<td>Pays Now for Tomorrow</td>
<td>Pays Now for Yesterday</td>
</tr>
<tr>
<td>Takes You to a Higher Level</td>
<td>Becomes an Obstacle for Growth</td>
</tr>
</tbody>
</table>

People who abuse time will not run out of excuses, but they will run out of time.

Basic Facts on Time Management
1. We all waste time.
2. We cannot change time.

3. We must accept time as the most important resource of mankind.
4. We cannot increase the quantity of time.
5. We cannot do everything.
6. We can only control time.
7. We must accept the fact that we are all procrastinators.

Facts 1-3 force us to take the first step in time management which is analysis.
Facts 4 & 5 take you to the second step planning and organization.
Fact 6 takes you to the third step control.
Fact 7 places before you the worst enemy of time and that is procrastination.

These are the facts. What you do with them will make your life more miserable or more enjoyable.
~ Dr. Antonio Herrera, Time Management Center, Inc.

“A day well spent brings happy sleep.”
~ Leonardo da Vinci.

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.

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Summer 2012 | AZ Water Association 41
ENVIRONMENTAL WORKSHOPS - TRAINING AND FREE PDHS

Legend Technical Services of Arizona, Inc. (LEGEND), a full-service environmental laboratory, provides assistance to water and wastewater operators and for the environmental community in obtaining training and professional development hours (PDHs) through free workshops held throughout Arizona and in the outreach areas as well as in the Phoenix & Tucson metropolitan regions. Visit the AZ Water Association website (www.azwater.org) for upcoming Workshops.

LEGEND’s Workshops are Free of Charge with a Light Continental Breakfast and a Door Prize

Wednesday, July 18, 2012 8:00 AM – 12:00PM  *5 PDHs
City of Yuma Public Works Building, 155 W 14th St., Yuma, AZ 85364
8:00am - 8:50am  Introduction to Asset Management – Edmundo Mendez, RWAA
9:00am - 9:50am  Safety, Working with the Lab and Sampling Tips – Dianne Frydrych, LEGEND
10:00am - 10:50am Basic Operator Certification Course – Edmundo Mendez, RWAA
11:00am - 12:00pm Lunch (on your own)
1:00pm - 1:50pm  Emergency Planning for Small Water & Wastewater Operations – Edmundo Mendez, RWAA
2:00pm - 2:50pm  Preservatives, and Sampling Procedures – Jeremy Duncan, Sunstate Environmental

Thursday, August 9, 2012  8:45AM – 4:00PM  *6 PDHs
City of Avondale, Municipal Operations Service Center - Lantana Conference Room
399 E Lower Buckeye Rd., Avondale, AZ 85323
8:45am - 9:00am  LEGEND Introduction – Robert Vertefeuille, LEGEND Director of Operations
9:00am - 9:50am  Overview of Arizona Drinking Water Rules – Donna Calderon, ADEQ
10:00am - 10:50am Disinfection By-Products Rule: Transitioning from Stage 1 to Stage 2, Donna Calderon, ADEQ
11:00am - 11:50am Public Water System Sampling Requirements – Donna Calderon, ADEQ
12 Noon - 1:00pm Lunch (on your own)
1:00pm - 1:50pm  Emerging Pathogens – Robert Vertefeuille, LEGEND Director of Operations
2:00pm - 2:50pm  Coliform Bacteria Sampling and Analysis – Robert Vertefeuille-Dir. of Operations
3:00pm - 3:50pm  Bottles, Preservatives and Sampling Techniques – Lisa Parrish- Client Services

Friday, September 7, 2012  9:00AM – 3:00PM  *5 PDHs
City of Bisbee, Council Chambers – 118 Arizona St., Bisbee, AZ 85603
9:00am - 9:50am  Sampling Tips, Bottles and Preservatives – Dianne Frydrych, LEGEND Technical Services
10:00am - 10:50am Water Chemistry & the Value of Water – Deborah Patton, Rural Community Assistance Corporation
11:00am - 11:50am Four Generations in the Workplace – Deborah Patton, Rural Community Assistance Corporation
12 Noon - 1:00pm Lunch (on your own)
1:00pm - 1:50pm  Hands On Sampling Techniques – Brian Merritt, Tucson Lab Manager at LEGEND
2:00pm - 3:00pm  Challenges of Bisbee’s 80+ Year Old Collections System; Mike Bollinger, Wastewater Superintendent

Class sizes will be limited. Please register by contacting Dianne Frydrych, Sales and Marketing Manager: (602) 324-5121 or dfrydrych@legend-group.com

LEGEND Technical Services of AZ, Inc. is a Woman Owned Small Business since 1959
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Turn-Around Time for most in-network analyses is 7-10 Working days including final report

If you’d like to schedule a tour of LEGEND call Dianne Frydrych
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HAUPPAUGE, NY • GARLAND, TX • MILFORD, PA • PALO ALTO, CA • SEATTLE, WA
The Water Infrastructure Finance Authority of Arizona (WIFA) is very pleased to announce the winners of its 2011 Project of the Year Awards.

WIFA’s Project of the Year Awards recognize the most exceptional WIFA-funded projects as demonstrated by their performance in resolving water quality and public health issues, acquiring public support, securing cooperative funding, achieving sustainability (energy and water efficiency) and executing exceptional system and project management practices. Projects in two categories, Drinking Water and Clean Water (wastewater), are nominated by WIFA project managers and loan officers. Members of the Board select the winners from among these finalists.

This year because of the many exceptional projects, the Board selected two Drinking Water Project of the Year Award winners. The three award winners were announced at the February WIFA Board of Directors meeting. “WIFA finances so many vitaly important and successful drinking water and wastewater projects each year, it can be a challenge to select a winner. These award-winning projects simply represent the best of the best,” said Sandy Sutton, WIFA Executive Director.

**DRINKING WATER PROJECT OF THE YEAR – BIG PARK WATER COMPANY’S ARSENIC REMOVAL PROJECT**

With funding provided by a $415,000 construction loan from WIFA, Big Park Water Company has completed its final two treatment facilities to bring all of its wells into compliance with arsenic standards. Big Park Water Company provides water utility service to approximately 3,000 customers in the Village of Oak Creek, just south of Sedona. Big Park’s drinking water project was nominated and selected because it resolved an Arizona Department of Environmental Quality (ADEQ) Consent Order for exceeding the maximum contaminant level for arsenic. WIFA presented the Company with the award in recognition of commitment to public health protection through the improvement of drinking water infrastructure and exemplary project management.

“One of the biggest reasons I nominated Big Park Water was that as a first-time borrower from WIFA, they did an excellent job managing their project and adjusting to the requirements associated with a federal funding source. In addition, the Company reduced costs by designing and constructing much of the project in-house,” said Melanie Ford, WIFA project manager. “Big Park customers are truly receiving maximum value for the dollars spent, and the funding was used for a very important public health project.”

**DRINKING WATER PROJECT OF THE YEAR – METROPOLITAN DOMESTIC WATER IMPROVEMENT DISTRICT’S PURCHASE OF THIM WATER SYSTEMS**

WIFA’s $4.25 million loan to Metropolitan Domestic Water Improvement District (Metro DWID) provided financing for the purchase of three water systems along with several much-needed capital improvement projects to improve these systems, including well equipping, an arsenic treatment system and a fixed network system. A portion of the project involved installing an automated meter reading system which qualified as a green/sustainable energy efficiency project. Metro DWID provides water utility service to approximately 70,000 customers in the Tucson area.

As a repeat WIFA borrower, the District continues to demonstrate excellence in managing their water systems as well as managing their WIFA-funded projects. Metro DWID was also selected for award because their projects included some of WIFA’s highest priorities as part of its mission to maintain and improve water quality in Arizona. Metro DWID has achieved better protection of public health, improved water and energy efficiency through the automated meter reading project, and consolidated management of several small systems struggling to maintain compliance.

**CLEAN WATER PROJECT OF THE YEAR – YUMA COUNTY IMPROVEMENT DISTRICT’S AVENUE B AND C COLONIA SEWER COLLECTION SYSTEM**

Avenue B and C Colonia is one of Yuma’s oldest neighborhoods, and approximately 96% of the residences in the Yuma County Improvement District have relied on household septic systems for wastewater disposal for decades. The septic systems leach in an area where the water table can rise sharply during irrigation of nearby farmland. The County documented an average of 25 complaints per year regarding failing septic leachfields resulting in surface pooling, backups in homes and odor issues.

The WIFA construction loan is one piece of a larger project that is also financed by the U.S. Department of Agriculture-Rural Development, the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADB). This phase of the project connected approximately 722 dwellings to the City of Yuma’s Figueroa Facility through a $1,437,915 WIFA loan. In 2004 an earlier phase of the project was awarded a $4,000 WIFA technical assistance grant for the formation of Yuma County Improvement District. WIFA awarded the District a $35,000 technical assistance grant in 2008 for the design of the collection system. Financing for the remainder of the design of the new wastewater collection and conveyance system was provided by a $300,000 low-interest, three-year loan from WIFA.
District staff showed outstanding skill in managing the project as well as handling the loan. The award is presented in recognition of exemplary project management and commitment to public health protection through the improvement of wastewater infrastructure.

“This project is a perfect example of a successful State Revolving Fund project. Not only does it improve the quality of life for the citizens of the Colonia, but it also helps to protect the environment by preventing the pollution of groundwater and the Colorado River,” said Stuart Peckham, WIFA project manager.

WIFA is a state agency dedicated to protecting public health and promoting environmental quality through funding and technical assistance programs. WIFA’s largest programs are its highly successful Clean Water and Drinking Water State Revolving Funds which together have provided more than $1.9 billion in low-cost financing and grants for projects which help protect Arizona’s water bodies and provide safe drinking water. WIFA’s bonds are rated Triple A, enabling WIFA to offer lower interest rates than systems can obtain from other sources.

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