Municipal Coordination

SUMMER 2015

Member Profile: Steve Shoaf

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while this is the summer edition of *NC Currents*, as I write this, it is currently spring. It’s probably sweltering outside as you read this, but I’m currently enjoying a sunny, 60° Easter Sunday. Duke, as the sole representative of the Atlantic Coast Conference (ACC) in the Final Four, beat Michigan State last night to make it to the championship game, and I hear Tiger Woods is going to try to resuscitate his golf game at the Masters. I’m on my back porch looking out over my back yard, which is covered in confetti from our first *Cascarones*, a Mexican Easter tradition, which was brought to us for the first time this year by some friends. This celebration was a tremendous amount of fun for all but six-year-old Oscar, who was sorely disappointed that the eggs did not contain any candy.

This past winter was a tough one for NC AWWA-WEA. As we were beginning the audit process, our financial assistant, Ms. Marianne Keser, was attacked by her own cat and hospitalized with cat scratch fever (no lie). Then came the February snows and the cancellation of our Eastern Biological Wastewater Operators School and Physical/Chemical School. We thought we would be in the clear after February, but then the phone system just up and died in March.

To carry on with the sailing analogy (from my previous two Chair’s messages) we got ‘knocked’ on this tack, and consequently, it is taking a little longer to reach the mark (the buoy or landmark that you need to go around for a particular leg of a sailboat race). Not to worry though, as we are busy preparing for our downwind leg. When we round the mark, we will hoist our spinnaker and overtake our competition. While everyone else is flying the same old run-of-the-mill spinnaker, we have a brand new model, and all eyes will be on us to see how it performs. In this analogy The Academy for Water Professional Development (Academy) is our new spinnaker, and folks from Virginia to California are excited to see how this new certification program is received.

Sailing in the spinnaker class is for experienced crews only, as is creating a new certification program. The spinnaker, though light in weight and beautiful to behold, is a tremendously powerful sail. If not operated properly it can cause the boat to broach (i.e., pull the entire boat over on its side). In fact, one cold February day I was racing with my good friend and boat captain, Dyk Luben, when I watched the boat just in front of us broach as they rounded the mark. The tip of the mast went completely below the water,
and the young woman working foredeck was pinned in the bowsprit, completely submerged for nearly a minute. This of course was excellent motivation for Dyk’s crew. We had a chance to take the lead, and we definitely did not want to get that wet. The key to sailing with the spinnaker is preparation and good communication. The spinnaker needs to be packed properly, the lines (aka sheet and guy) and halyard need to be attached to the clew, tack and head of the sail respectively. Every crewmember needs to know his or her role and perform it in a proper and timely fashion. The captain needs to make sure crew members know whether they will do a windward or leeward hoist and make preparations accordingly. Done properly it is a lot of fun. Done improperly, you may find out where the phrase “mouth like a sailor” comes from. Fortunately for us, our NC AWWA-WEA volunteers have the necessary experience to ‘sail’ with the best, and they have been putting in the hard work necessary to roll out the Apprentice level training for the Collections and Distribution tracks of the Academy this July at the Western Collection and Distribution School. The work does not stop there. Currently, some of our members are developing the training for the Journeyman 1, Journeyman 2 and Master levels for the Collection and Distribution tracks, while others are preparing to roll out another new track. While we are truly excited about our new spinnaker, I would be remiss if I didn’t mention our new roller-furling jib, by which of course I mean the Institutes. In the midst of the doom and gloom of February, we held our first Institute for Charlotte Water. The program was a huge success thanks to the hard work of our volunteers, staff, and our top-notch presenters. The program was so well received that we are now planning to put on a similar program, later this year, that is not specific to any local government utility. This is in addition to the Institutes we are planning with the Cape Fear Public Utility Authority, the City of Raleigh Public Utilities Department, and City of Greensboro Water Resources Department. The focus of this issue of NC Currents is Municipal Coordination, which ties in nicely with our Institutes and Academy programs. Through the Institutes, NC AWWA-WEA works directly with the municipality to develop a training program to meet the municipality’s need. And through the Academy, NC AWWA-WEA is preparing municipal water professionals for supervisory and management level jobs. So please enjoy this issue of NC Currents, and remember, if you haven’t already done so, please visit ncsafewater.org to update your profile in our new database so you can access and print your professional development hours.

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Executive Director’s Report

Required: Wry Sense of Humor

Lindsay Roberts, CAE, Executive Director

It started with the database upgrade – something more than 200 hours of staff overtime over the Christmas and New Year’s holiday (and not much ho-ho-ho for Catrice or Nici.)

Then it was the Cyberwall virus – everything on the server encrypted; a ransom note from the cyber-terrorist, demanding payment in Bitcoin to de-encrypt the captured files; days of anxious waiting while the kind, loyal, and trusty magicians at Cii Technology Solutions worked round the clock for days, like the brain-surgeons they are, to save the life's-work of every staff member and countless volunteers.

January is audit time and tax preparation time. It was also the month of the Great Cat Scratch Incident. While 1099s were due along with County Business Property Tax forms, end of the year accounting, setting up of the new budget, and auditors in the office… Marianne, our Finance Coordinator, was lying in the hospital for eight days of intravenous antibiotics and surgery for an abscess after a scratch from Daisy (The Cat) who was scared by a dog while out for a walk on a leash. Thanks to pre-planning and pro-active preparation by Marianne – and great support from Langdon and Company CPAs – yet another crisis was averted and deadlines were met.

No time to recover though, as this was followed by a failed drive on the server and the emergency migration of all that newly reborn work – so recently snatched from the jaws of the cyber virus – to a new residence in The Cloud, which, of course, was not the light, airy, floating-above-the-roar-and-crash-of-the-waves that its name implies. Oh no, this was a frantic, desperate, scrabbling-for-a-foot-hold in the torrent of re-learning how to operate everything.

At first, it all looked vaguely familiar, but on a moment’s examination, it was indeed different enough that it might as well have been a transformation from English to Greek, or Basque, or Finnish. An action that once took seconds, suddenly required minutes, or worse, hours, and a stack of work that might have been done in a day was transformed into a week’s work. Clicking in and out of emails to web browsers to look at Doodle Poll results, or to open documents sent by AWWA or WEF became a monumental task. Newer versions of software were NOT intuitive for this old geezer to operate. More ethereal maneuvers were performed by Cii, including remotely accessing the screen of the desktop, with the cursor gliding about the screen, disconnected from the mouse.

And after that, it was the phone system’s server, as dead as a fish, floating belly-up, with glazed eyes. No calls in. No calls out. No fax. This resulted in a frantic search for a new system and negotiations to get the price to something less than a fleet of helicopters or a private yacht. Nothing was available in less than 30 days. So we bought handset home phones with batteries needing 12 hours to charge. Ringing, ringing, ringing, and no way to answer. This is the stuff of nightmares!

And of course, it could never just be IT problems that be-deviled us. Mother Nature took 40 whacks at us as well. Snow. Ice. More snow, heavy, wet, and then more ice on top of that – all of it came the very week we had Wastewater Schools and Maintenance Tech Schools in Raleigh. Everything had to be canceled. Then the power went out at the office – not that it much mattered at that point, as we had no computers or phones anyway.

All of this equals more than 200 hours of lost work time for staff. All of this equals a big headache for volunteers and members.

There was much gnashing of teeth and pulling of hair, along with attempts at gallows humor. A wooden frog, named Studs Terkel (who rests in Bughouse Park) was brought in as a metaphoric bug-catcher, but despite pennies on his feet and a nice Krispy Kreme donut all for himself, he’s done nothing!

Despite all these calamities, Spring Conference planning and registration went on; the Collections and Distribution School has taken place; the audit proceeded and taxes filed; the Endowment Scholarship applications period has come and gone; the Board has met and packets were prepared; AWWA’s RMSO took place and presentations were ready; contracts for Annual Conference 2018 and 2019 were negotiated; the first Institute took place at Charlotte Water; Career Ladder and Curriculum development continued; NC Currents was written, edited, and published; eNews went out as always; books
were ordered; manuals printed; and 2500 meals were ordered and served at schools and committee meetings. Hopefully, thanks to the absolute wizardry and sheer grit and determination of the staff-women of water (although beaten down to the size of trolls) most of this drama has gone undetected by most of our members.

Through all this “Winter of our Discontent,” there have been a lot of white-hatted heroes who have risen to the challenge and ridden to our rescue. The volunteers on the Wastewater and Maintenance Tech Schools Committees were phenomenal – people like Billy Allen, Dell Harney and Brandon Garner; NC DENR staff, Steve Reid and Debbie Soles; the staff at Cii Technology Solutions, Mike Taylor, Gray, Jose, and Daniel. These people were unbelievably dedicated.

The Board of Trustees bravely embraced sweeping changes in the budget and allocated reserve funds that have been vital to the rescue effort. The Board has also supported a restructuring of staff. The IT turmoil has amplified the need to create some additional staff bench-strength. As a result of the Board’s support, Catrice Jones, who has been with NC AWWA-WEA for 14 years, was promoted to the position of Director of Education, and Sonya McLamb, who has worked part-time, is now the full-time Training Coordinator. As the Education Department staff, they are the primary support staff for Conference Committees, Technical and Education Committees and Schools Committees. Nicole Banks, who first started working for NC AWWA-WEA 13 years ago, and after moving to Texas and then Florida, worked as an independent contractor to NC AWWA-WEA for the past seven years, has been hired to a full-time position as Director of Marketing and Communications. Nici and Erin Mallis, the External Committee Services Coordinator, together are the primary support staff for External Affairs Council Committees, including membership, communications, marketing, Endowment, Water for People, Public Education, and Young Professional activities. Marianne Keser will continue to work part-time, as Financial Coordinator.

Of course, when we make our list of those we are grateful to, you, dear members and volunteers, are very high on our list. Thanks so much for extending to us your patience, perseverance, courtesy, and understanding. This year, we have surely had some challenges in giving you the service that we want you to have, and that you richly deserve. We are grateful to you for your kindness and forbearance.

This is what makes NC AWWA-WEA the extraordinary and exceptional organization that it is. More than a business, NC AWWA-WEA is something like a family, definitely a community, with dedicated and caring folk who will rise to whatever crisis arises, and do whatever it takes to resolve it.

I have never been so proud or pleased or grateful to work with such a wonderful group of people: staff, leaders, volunteers, and professionals. Together, we can do anything.
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The following actions were taken:

1. **Strategic Governance** – discussion of the following:
   - Charlotte Water First Institute to be held on February 5. All 100 seats sold out immediately, and there is a waiting list.
   - Development of a mobile app for Annual Conference program to be explored by Ryan LeBlanc to determine if volunteers can accomplish the work without staff involvement or expenditure of funds.
   - Development of training for utility managers was proposed.
   - Leadership Mentoring Task Force, chaired by John McLaughlin, now seeking mentors and mentees.

2. **Action Items:**
   - Personnel Policy – amended, eliminating requirement that staff take a 30-minute unpaid lunch period daily; hours worked by exempt staff may not carry from one pay period to the next.
   - Accounting and Finance Policy – amended, increasing the aggregate credit limit for staff credit cards to a total of $30,000.
   - Web Site Privacy Policy – amended, establishing method for members to authorize a second person to access records, and etiquette for online groups.
   - Annual Review of Record Retention and Disposal Policy – no amendment. Noted that complete historic records have never been available. In 2011, staff began to maintain a log of records available and initiated a storage contract with Iron Mountain.
   - YP Modified Work Plan – amended, authorizing fundraising event to be held in 2015; payment for travel for student competitions from General Fund; distribution of any prize money for competitions to students.

3. **AWWA Report:**
   - AWWA philanthropic effort is moving forward. A team of interviewers to hold data-mining conversation with NC AWWA-WEA.
   - AWWA office to be established in India and an executive director to be hired.
   - Sections asked to identify viable water projects for the AWWA engineering corps outreach.
   - AWWA Water X Exchange is being established to promote sharing and trading of educational programs from Sections.

4. **Chair’s Report:**
   - Contact from New York attorney interested non-flushability of ‘flushable’ wipes. Board consensus to provide this information to members of the Joint Public Education Group.
   - Staff to share one-time lump sum bonus of $15,500 in recognition of successful year in 2014.

5. **Executive Director’s Report:**
   - Your Membership data conversion went live on time, January 5, but 200 hours of staff overtime was required.
   - NC AWWA-WEA sustained a serious computer virus attack on the server.
   - Failed drive on the server necessitated a data migration to cloud-based server.
   - Audit is underway.
   - Finance Coordinator, Marianne Keser, hospitalized eight days for an infected cat scratch.

6. **Consent Calendar - Approved:**
   - Minutes of the board meeting of November 16 and 19, 2014.
   - Treasurer’s Report November 30 and December 31, 2014, with total assets as of December 31, 2014 of $1,226,023.54 with $1,195,665.51 in checking/savings, of which $364,182.84 is endowment funds. The balance of unrestricted net assets (checking minus endowment) is $831,482.67 and net income of $115,910.44, with endowment donations and investment income ($36,980.26) deducted for a net income YTD (prior to audit) of $78,930.18.
   - Water For People profit and loss as of December 31, 2014 is $30,974.13 of income and expenses of $21,001.41 transferred to Water For People National in 2014 and event expenses of $9,857.52 for net income YTD of $114.90. Water For People balance sheet as of December 31, 2014 reflects total current assets of $200.
   - Committee Reports received through January 16, 2015.

7. **Adjourn** - next meeting is March 19, 2015 at Falls of Neuse WWTP.
The following actions were taken:

1. Audit and Tax Presentation – Langdon and Company:
   - A clean opinion was received on the audit.
   - Cash increased, so reserve funds increased, of which $640,425 is designated by policy.
   - Total endowment at year-end was $369,124.
   - All 990 Tax information is consistent with audit.
   - All IRS required governance policies are in place.
   - Reporting of Public Support Percentage is required to be not less than 33%; NC AWWA-WEA is at 96.45%, which is very good.

2. Strategic Governance:
   - The board reviewed the strategic planning and governance process.
   - The board reviewed the goals and initiatives for membership engagement.

3. Action Items:
   - CLOSED SESSION was held to review staff reorganization proposal.
   - Approved the reorganization, with promotion of Catrice Jones to the position of Director of Education; hiring of contractor Nicole Banks as Director of Membership and Communication; and increase to full-time the Training Coordinator position.
   - Approved the scholarship lump sum appropriation for 2016 at $13,000.
   - Approved 2016 AWWA dues at 20% level; and 2016 WEF and SLAM dues at $60.
   - Ratified appointment of Bill Kreutzberger as the NC AWWA-WEA representative to the Nutrient Criteria Implementation Committee.
   - Approved revision of the Social Media Policy, limiting committee social media pages to those already in existence, and requiring all committee social media pages to be publicly accessible and with staff administrative access to those pages.

4. Chair’s Report:
   - Curriculum Development Task Force is working on the “Need to Know” criteria for the collections & distribution career ladder.
   - Community College Computer Labs will be available for use for Academy training at Collection and Distribution Schools.
   - Courtney Driver has been appointed as Chair of the Utility Management Committee, replacing Joe Stowe and Jackie Jarrell, who have both resigned due to time constraints.
   - Contracts for Spring 2016 in Asheville are signed, but no contracts for 2017 will be signed until after Spring 2015 data is available for board review and board direction.

5. Executive Director’s Report:
   - Wastewater and Maintenance Tech Schools were cancelled in February, due to heavy snow in Raleigh. Wastewater Schools will be rescheduled for July. There will be only one Maintenance Tech School. The full financial impact will not be known until after July.
   - Endowment scholarship application period for some scholarships has been extended to March 27.

6. Consent Calendar - Approved:
   - Minutes of the board meeting of January 29, 2015 were approved.
   - Treasurer’s Report for January and February 2015, with total assets as of February 28, 2015 of $1,274,535.67 with $1,240,965.64 in checking/savings, of which $375,226.16 is endowment funds. The balance of unrestricted net assets (checking minus endowment) is $865,739.48. Water For People balance sheet as of February 28, 2015 reflects total current assets of $188.
   - CD’s maturing at Truliant Credit Union to be transferred to SILC CD’s at Sun Trust Bank, with the amount to NC WEA by NC AWWA at year end, per the audit, to be transferred from NC AWWA’s CD’s and deposited to NC WEA CD’s.

   - WEF Report:
     a) House of Delegates is continuing to discuss Operator of the Future.
     b) WEF Residuals and Energy Specialty Conference will be in Washington DC in June.
     c) WEFTEC is in Chicago in September.

   - AWWA Report:
     a) RMSO is in Florida March 25-27; ACE is in Anaheim in June.
     b) Sections are being urged to submit proposed Engineer Corp project proposals.
     c) Planning for AWWA/RCAP/EPA grant-funded training is proceeding. Steve Shoaf and Ron Hargrove will assist.

   - Committee Reports received through March 6, 2015.

7. Adjourn - next meeting is May 21, 2015, 9:30 a.m. until 11:30 a.m. at Greensboro Coliseum Complex.
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## 2015 Committee Chairs and Board Liaisons

(This list is current as of December 10, 2014)

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<th>Name</th>
<th>Company</th>
<th>Contact Number</th>
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<tbody>
<tr>
<td>AC Local Arrangements</td>
<td>Chuck Shue</td>
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<td>2015 Spring Conference</td>
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<td>Exhibits</td>
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<td>Sponsorship</td>
<td>Wendy Banks</td>
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<tr>
<td>Awards Committee</td>
<td>Julie Taylor</td>
<td>Arcadis</td>
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</tr>
<tr>
<td></td>
<td>Steve Shoaf</td>
<td>City of Asheville</td>
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For more committee information visit individual committee web pages on www.ncsafeewater.org.

### Board Committees

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<tr>
<th>Committee</th>
<th>Chair</th>
<th>Company</th>
<th>Contact Number</th>
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<tbody>
<tr>
<td>Nominating</td>
<td>Jackie Jarrell</td>
<td>Charlotte Water</td>
<td>(704) 391-5181</td>
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### External Affairs Council

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<tbody>
<tr>
<td>Communication</td>
<td>Leslie Jones</td>
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<tr>
<td>Endowment</td>
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<td>Willis Engineers</td>
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<td>Crowder</td>
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<td>Stantec</td>
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<tr>
<td>Water For People</td>
<td>Maggie Pierce</td>
<td>Hazen and Sawyer</td>
<td>(919) 863-9259</td>
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<tr>
<td>Young Professionals</td>
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<td>Brown and Caldwell</td>
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<td></td>
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### Technical Program Council

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<th>COUNCIL CHAIR:</th>
<th>Name</th>
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<tbody>
<tr>
<td>eLearning Task Force</td>
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</tr>
<tr>
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<tr>
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<td>WK Dickson</td>
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### Technical Program Council

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<th>Company/Agency</th>
<th>Phone Number</th>
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<tbody>
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<tr>
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#### Schools Council

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<tr>
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Committee Spotlights

Technical Program Council
As the council chair, Betsy Drake’s goal is to facilitate and enhance communication among the 11 committees under the umbrella of the Technical Program Council as well as between the committees and the Board of Trustees.

The new Institute program shifts the Association’s focus from producing seminars based on committees’ interests, to developing on-demand programs based on a hosting utility’s needs. NC AWWA-WEA committees will then create training programs based on the requested topics. The Council will work closely with members of the committees to coordinate this process.

Seminars and Workshops
With roll out of the new Institute Program, planning of one-day seminars has changed over the last year. Many of NC AWWA-WEA’s seminar offerings are now driven by utility requests for Institutes.

Over the past year, the Seminars and Workshop Committee has been assisting with the rollout of this new program. Under the leadership of Betsy Drake, Technical Program Council Chair and Erika Bailey, Seminars and Workshops Chair, working closely with NC AWWA-WEA leadership and staff, the committee helped with working with utilities potentially interested in hosting an Institute. Members of the committee assisted with contacting potentially interested utilities and providing information regarding the new program, such as structure, pricing, venue, potential topics, and schedule logistics.

One of the key elements of the new Institute program involves working closely with utilities to develop topics to be covered. Seminars and Workshops

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collaborates with other technical and educational committees that have expertise in the requested topics to identify specific speakers and presentation topics that best meet the utility requests.

The first Institute was hosted by Charlotte Water on February 5 and sold out at 100 participants! The committee extends a special thanks to Mary Knosby who volunteered as the lead technical coordinator for planning and facilitating the first Institute. The seminar was focused on four major topics – legislative updates, EPA regulatory updates, GIS and mapping, and sampling. NC AWWA WEA is considering offering this seminar again as a stand-alone event to provide additional opportunities for others to attend since the event did sell out and there was a waiting list for additional attendees.

The second Institute was hosted by Cape Fear Utilities on May 19. Special thanks go to Reed Barton who volunteered as the lead technical coordinator for planning and facilitating this successful Institute. This Institute was also very well attended and covered a wide variety of topics, including pipeline condition assessment, trenchless utility installation, on-line instrumentation, construction, security, and operations and maintenance of pumps, generators, and switchgears.

The City of Raleigh Public Utilities Department also requested two consecutive Institutes offering the same training on both days. The consecutive training days provide the City with the ability to split training over two days, which allows for easier scheduling. The Raleigh Institutes were scheduled for June 24 and 25 with a focus on risk management and emergency preparedness, utility management, construction issues, sustainability, and blueprint reading. The committee would like to extend its thanks to Lamya King who volunteered as the lead technical coordinator for planning and facilitating this Institute.

In addition to the utility-requested Institutes, NC AWWA WEA is also still offering traditional stand-alone seminars. The stand-alone seminars are organized by a Technical Program Council Committee and/or by the Seminars and Workshop Committee. This year, the Seminars and Workshops Committee is planning two stand-alone seminars. The first is the Drinking Water Rules and Regulations Seminar, which will be hosted in Raleigh on July 30. The second will be a Construction Issues Seminar, planned for December 2015. Because these have been historically some of the most popular stand-alone seminars, NC AWWA-WEA wanted to continue providing these as training opportunities.

In addition, the Risk Management Committee is planning a one-day stand-alone seminar in late summer/early fall that will cover “Emerging Issues in Emergency Preparedness, Safety and Risk Management” and the Seminars and Workshops Committee will provide guidance and support.

In summary, the committee is doing much of the same type of seminar planning, registration, and logistical coordination activities but under a different format driven by requests for individual Institutes.

The primary goal is to continue to assist with providing high quality technical training events for our industry. With the rollout of the Institute program, the committee’s goal for this year is to conduct four institutes – a goal already within reach. At the same time, the Seminars and Workshop Committee will also continue to plan and support other committees in hosting stand-alone seminars focused on timely topics for our industry.

**Automation**

The Automation Committee develops, recommends, supports, and conducts continuing assessments of technologies and techniques to promote understanding of process instrumentation, control and automation equipment, Supervisory Control and Data Acquisition (SCADA), telecommunications, information technologies, and the management of information in water and wastewater treatment.
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Once every quarter, the committee provides two meeting locations connected by WebEx.

Opportunities for volunteering include finding speakers, writing technical papers, or teaching at the schools. Last year, the committee worked with Wake Technical Community College to help provide insight on the development of curriculums geared toward automation, specifically where related to water and wastewater. In fact, the committee’s second quarter meeting was held at Wake Tech in the college’s new SCADA training center. The new curriculum will begin in summer 2015.

At the NC AWWA-WEA Spring Conference, the Automation Committee provided a panel of experts for a forum on wireless technology and its benefits for water and wastewater facilities. The committee plans to help with the NC AWWA-WEA Training Institutes by providing technical expertise with regard to automation.

To demonstrate the importance of automation in water and wastewater and to recruit more young people into the field, the committee has also scheduled speaking engagements with NC AWWA-WEA student chapters and other organizations.

### Wastewater Collection and Water Distribution Systems

The Wastewater Collection and Water Distribution Systems Committee’s mission continues to involve supporting, educating and representing the membership of the NC AWWA-WEA regarding issues dealing with the operation, maintenance, planning and management of wastewater collection and water distribution systems. The committee is actively seeking new members and speakers for round table discussions.

Meetings are held every two months and alternate between water and sewer discussion topics. With locations rotated throughout the central part of the state, meetings are held in-person or via conference call. Typically, each meeting has a lunch seminar of interest to the hosting municipality. Past presentations have included leak detection (City of Raleigh), SSO reporting (City of Greensboro), water distribution O&M program (Charlotte-Water), FOG program (City of Wilson), SL Rat (City of High Point), and 811 reporting (Charlotte Water).

The committee also selects recipients for the Collection System of the Year Award, Distribution System of the Year Award, and the Golden Manhole Award, given out at the Annual Conference. Please contact the current chair (Barbara Moranta – morantaba@cdmsmith.com) or vice chair (Jim Perotti – JPerotti@brwncald.com) if you are interested in participating in the committee.

### Resource Recovery and Reuse

Meeting quarterly, in person and by teleconference call, the committee develops, recommends and implements programs that foster the understanding and pursuit of safe and beneficial recovery and reuse or resources generated by water and wastewater treatment plants.

Activities over the past year include a successful one-day seminar on current topics related to reuse and biosolids. In the coming year, the committee plans to work with a marketing class at UNC Charlotte to help craft new and pertinent messages about reuse and biosolids.

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Committee Spotlights

At the helm of the committee is Jean Creech, past-chair of the Biosolids Committee and the Public Education Committee. She invites members to join in the work of Resource Recovery and Reuse.

**Risk Management Committee**

The goal of the committee is to help NC AWWA-WEA members prepare for a full range of risks – financial, safety, legal, disasters, business continuity, etc. Monthly meetings are held at alternating locations with the capability for phone or online participation. Volunteer activities include presenting at meetings, assisting with seminars, helping other committees with risk management, and coordinating the safety and emergency preparedness awards.

Last fall, the committee conducted a well-attended seminar at the Greensboro Coliseum. In addition, past Chair Jack Moyer and two committee safety members, Frank Castillo and Matt Schweitzer helped with the new curriculum development program. (Castillo also submitted the first bilingual article to NC Currents.)

The past year also saw committee members participating and presenting at two tabletop exercises – an EPA-sponsored one in Charlotte and a Colonial Pipeline-sponsored one in Greensboro – focused on disaster preparedness and proper protocol for Incident Command Centers at local and federal levels. The committee supports NC-WARN, chaired by member Mike Richardson, who provides regular updates.

Always looking for new members, the committee plans to continue giving workplace presentations in the coming year and will be conducting one of its two webinar for NC AWWA-WEA in July or August. Plans are being made to disseminate further risk management information at the Annual Conference.

**Regulatory Affairs**

The mission of this committee is to provide education and training opportunities to the NC AWWA-WEA membership on issues, regulations and public policy affecting the management, quality and protection of our vital water resources. Members are involved in sharing and news, information and ideas with NC AWWA-WEA membership through planned meetings, seminars and conference calls. Other activities include securing speakers for meetings, tracking legislation, organizing training and helping spread the word for training events.

Quarterly meetings are held via conference call with an annual meeting conducted in person near Raleigh. Members also communicate in response to legislative updates on an as-needed basis.

As the committee now falls under the Technical Program Council, there is a shift to a training focus with an effort to include legislative updates for both federal and state activities. On July 22, the committee will host a technical training session in Greensboro targeted to smaller utilities (under 10,000 customers), as part of an AWWA EPA Grant. This will be followed in the fall by a presentation at the annual conference.

**Utility Management**

In February 2014, the Utility Management Committee hosted a full day workshop titled “Communicating Your Utility’s Financial Position to Your Board and Customers.” Utilities have to communicate effectively with their stakeholders who mainly include citizens and elected officials. Each year, utilities determine their water/wastewater budgeting needs and the necessary level of water/sewer rates to support the budget. It is essential for utilities to be able to successfully get operating and capital budgets and rate adjustments approved. It is also important for utilities to communicate the value of the services they provide and to ensure consistency with other governmental agencies (states/federal legislation). Effective communication with citizens and elected officials is key to gaining approval for budgets/rates, but also for the overall financial sustainability of the utility. The purpose of this workshop was to provide utilities with strategies on how to communicate effectively with stakeholders in order to sustain the financial viability of the utility.

During 2015, the Committee will be working on future workshops that meet the overall vision of the NC AWWA-WEA. The goal to assist in developing workshops that fit within the new curriculum to be offered by the Association. The Utility Management Committee meets quarterly and is always looking for new members who are interested in water and wastewater financial and management issues.
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When Steve Shoaf was chair of NC AWWA-WEA in 2008, he proposed the creation of an endowment for scholarships. Ever since then, the Endowment Committee has been active, and so has Shoaf, both in terms of fundraising and selecting scholarship winners. "It's been a point of passion for me," says the City of Asheville's Director of Water Resources, "to grow that endowment and try to enlist engagement from the membership to make it successful."

The purpose of the endowment is to provide educational support for people who may choose a career in the water industry, thereby addressing the challenges presented by professionals, like Shoaf, who have been in the industry for decades and are now getting ready to retire.

As an undergraduate, Shoaf never foresaw that he would devote his life to the safety of water. But after graduating with a B.A. in zoology, he joined the Peace Corps and spent two and a half years in Cameroon, West Africa. It was there that he developed an interest in public health, and more specifically, water. "My whole involvement in the water industry evolved from there," he recalls. "The protection of public health has always been my approach to water and wastewater operations."

Performing various projects, from water quality assessments on surface water, to treatment technique and toxicity studies. During his time as a research analyst, he and his wife welcomed their first of two boys. Realizing that he needed a job that would support a family, Shoaf accepted a position as utilities director with the City of Burlington, where he spent the next 21 years managing both water and wastewater. "I felt like I had a really good experience there, with the opportunity to see every aspect," he notes, adding that when he first arrived the department was struggling. "I really felt like I made a difference by selecting competent people, providing training, and maintaining and equipping the facilities. I felt very good about helping Burlington develop a strong department and program for protecting public health and the environment."

But being responsible for water and wastewater felt a lot like having two different jobs. The engineering challenges were different, as were the regulatory issues and treatment techniques. "It was interesting and fun, but at times it could be overwhelming," recalls Shoaf.

In 2009, he opted for a change of pace, accepting a position as Director of Water Resources for the City of Asheville, a larger city, but one where he would finally have the opportunity to wear ‘a single hat.’ Recalls Shoaf, "I thought it was going to be less stressful. That didn't happen but it was nice to have a change of gears and to stay focused on one thing."

At Asheville, he was responsible for following the water system source to tap, from protecting the watershed, to treatment and distribution, including customer service, billing, maintenance, meter services and engineering.

"It is a large department and I have to know at least a little about all of it," he points out. He relies heavily on the skills and dedication of the departmental personnel, and enjoys helping staff correct the shortages and deficiencies in the department. These issues often include safety, customer service, and trouble shooting operational problems in the system.

He describes the challenge as a balancing act between what needs to be done and the resources necessary to do it, resources that depend on the approval of elected officials and the will of the electorate. "A lot of people take water for granted and are not aware of all that goes on behind the scenes," he points out.

Shoaf has experienced first hand what it is like not to have the convenience of clean running water at the twist of a turn of the tap. While in Cameroon with the Peace Corps, his daily routine included a two-kilometer trek to the local water point.
His deep appreciation for the work of the water industry has also prompted him to be heavily involved with the various professional associations. After he started in Burlington in 1988, he signed up for the Water Pollution Control Federation (now WEF) and the American Water Works Association (AWWA) and became active at the state level. Over the years, he has chaired six and sat on a dozen different committees, serving on several tours of the NC AWWA-WEA board, including as chair.

One of the first committees he joined was the Wastewater School Committee. Twenty years later, he is still involved with teaching the operators so they can receive their certification. "I feel like we have a pretty strong program going but, of course, there can always be improvements and enhancements," says Shoaf.

Most of the changes, he notes, have been driven by the membership of the NC AWWA-WEA. Members keep identifying more goals they would like to accomplish and more activities they would like to pursue, driving the level of activity at NC AWWA-WEA to ever-greater heights. "It's amazing how much NC AWWA-WEA has grown in 25 years," says Shoaf. "As you engage more people with different interests, your area of focus expands."

NC AWWA-WEA has seen such robust growth that he did not feel the need to get involved at the national association until recently, when he served as AWWA Director for the North Carolina Section, as well as AWWA Vice-President. But later this year, Shoaf will be retiring, not only from his volunteer positions but also from his role as Director of Water Resources for the City of Asheville.

By its very nature, he explains, working for utilities requires a narrow focus. After 40 years, he is ready to explore the world beyond the water industry. June 30 marks his last day with the City of Asheville "My career was something that matched my passion with an opportunity to make a difference," says Shoaf. "I've enjoyed the time but I'm ready to see what else is going on."

Even in retirement, he is bound to keep up with what is going on at NC AWWA-WEA. After all, it's in his blood. But the time has come to pass the torch. Thanks in part to Shoaf's work with the endowment initiative, the seeds of the future will fall on fertile grown. "Long after this generation of water professionals is gone," he reflects, "the endowment will, hopefully, still be going strong. Whether anyone remembers where it came from is immaterial. The important thing will be that it allows NC AWWA-WEA and its members to continue making a difference."
Anyone who knows Jonathan Ham knows he loves to talk. When he lived in the Wilmington area, during National Engineers Week, he would take on an entire day of middle school teaching for his teacher friend at Murray Middle School in Wilmington. He tailored his presentation to whatever she was teaching around the time of his visit, all the while showing how important engineering is to everyday life. “It was not only about helping her out, it was about promoting engineering to kids who are starting to seriously work on their science and math,” explains Ham.

Along with the ‘gift of the gab,’ the 34-year-old has a seemingly bottomless passion for the profession and an incredible drive to match. Take, for example, the fact that he completed his Masters in Business Administration (MBA) from UNC Wilmington, welcomed his first child, moved to a new home and city, and started a new job, all in the past two years. “It has been a whirlwind,” grins Ham from his office in Garner, where he works as the Assistant Town Engineer, a position he has held for a year now. “I’m extremely excited to be here!” Garner, a city of 27,000, southeast of Raleigh, is growing at an impressive rate, and the future for Ham there is bright.

His job combines everything he loves about engineering: solving problems, helping the public and talking to people. “I have found my sweet spot,” he says. “I enjoy interacting with the public, getting to know their stories, and trying to figure out how I can help them.”

He points out that the first fundamental canon of engineering is safeguarding the safety, health, and welfare of the public. “As a government engineer, that’s what you’re doing,” he adds. “You’re standing in the gap.” Whether that involves plan reviews for private developers, looking at ways to increase safety on town streets through lighting or sidewalks, or a myriad of other duties, protecting the public is the ultimate goal. “It’s amazing to get to do that,” he adds.

Given Ham’s obvious passion for his work, it may be surprising to learn that it was not his initial plan when he went to college. In 1999, he started his post-secondary education in the Aerospace Engineering program at NC State University, with the goal of moving to the Pacific Northwest. The summer break after working through his first year at NC State, Jonathan went to work for NCDOT. “I got into construction management, and I was hooked,” he recalls. “Once you get that dirt in your veins, you don’t get it out.”

In 2005, he completed his Bachelor of Science in Biological Engineering with an Environmental Engineering Concentration. During his years at NC State, he not only found his passion for engineering, but also his wife, Kelly. They met in the fall of his freshman year in the NC State Marching Band, and have been together ever since.

After graduation, Ham started his career in the private sector, moving to Wilmington where his wife (then fiancé) had a job with McKim & Creed. He worked as a staff engineer and project manager for two private consulting firms prior to October of 2008. Then, in November 2008, Bill Pinnix offered the young engineer a position as project engineer at the Cape Fear Public Utility Authority (CFPUA).

It was also Pinnix who urged Ham to become involved with the NC AWWA-WEA, mentored him through the process of obtaining his Professional Engineer license, and then encouraged him to pursue an MBA. Although they no longer work for the same organization, Ham still sees Pinnix as his friend and mentor. Ham’s boundless energy notwithstanding, it must have been a challenge to undertake all these activities at once. Even before he had finished his MBA, NC AWWA-WEA Communications Committee Chair Tom Bach had pulled him into the committee. Around the same time, Jonathan joined the Spring Conference Committee, working, along with many others on the committee, until the 2015 event, the last to be held in Wilmington prior to rotating to other locations. (The conference moves to Asheville next year.) “I love
volunteering,” says Ham, who sat at the registration desk this year. “The Spring Conference Committee is full of fun, hard-working people.”

At CFPUA, Ham worked in every division of the engineering department and had the opportunity to work on planning and emergency designs. “I experienced a lot of different facets of the authority,” he explains, adding that his work involved plenty of problem solving. “When a pipe breaks, you don’t always have time to hire a consultant. You have to get in there and figure out what’s going on and how to fix it.”

His fondest memories are of the people at CFPUA, colleagues whom he describes as sharing the same passion to solve problems and help people. Several projects in which he was involved also stand out. One was the conclusion of a project at the Sweeny Water Treatment Plant, which involved an expansion to 35 mgd. Not only did the experience result in a close friendship with Water Resources Manager, Mike Richardson, but Ham also had the satisfaction of seeing a project evolve through construction and into the warranty phase. “Other people drove the long distances, and I got to kick it into the driveway.”

Another exciting project involved bringing the sewer system to an area where septic fields were failing. Although Ham left Wilmington before completion, what made this project so memorable was the awareness that he was helping people.

This opportunity to work for the public good is also what makes his current job in Garner so fulfilling. While he no longer directly deals with failing water lines or sewer spills, he is still responsible for stormwater, so water continues to be part of his life. “When citizens have flooding in their yard or in the street, they call me,” he explains, noting that North Carolina has had an unusually large amount of rain over the past year.

Outside of work, he continues to serve his profession as well. He served as governor, president elect and president of the Southeastern chapter of the Professional Engineers of North Carolina (PENC) and was named the PENC Young Engineer of the Year in 2011. This year, he was honored by PENC as the Government Engineer of the Year for the state of North Carolina and has been selected for the NSPE 2015 Professional Engineer in Government Achievement and Service in the United States (PEGASUS) Award. He currently serves as the Secretary of PENC’s Educational Foundation Board of Directors and recently became involved in the American Public Works Association.

How did he manage to juggle a new job and a new baby with professional service? “Being in private consulting at the beginning of my career shaped my work ethic,” explains Ham. “When someone needs assistance, I try to provide it immediately.” In that case, if the past 10 years are any indication, he is not about to slow down any time soon.

“Being in private consulting at the beginning of my career shaped my work ethic. When someone needs assistance, I try to provide it immediately.”
Catrice Jones and Nicole Banks
Growing NC AWWA-WEA

As the NC AWWA-WEA launches its new Academy Career Ladder and Institutes Program, the organization will be relying heavily on the skills of its two longest-standing employees: Catrice Jones and Nicole (Nici) Banks. A restructuring of staff, supported by the Board, has seen Jones assume the position of director for the newly created Education Department, and Banks hired as full-time director of Marketing and Communications.

“One of my 30-year career in non-profit association management, I’ve worked with many gifted and hard-working people, but Nici and Catrice stand out tall in the crowd,” says Lindsay Roberts, NC AWWA-WEA’s current executive director. “Their dedication to the men and women who work in the water industry, to NC AWWA-WEA as an organization, and to the staff team here, is exceptional.”

Jones joined NC AWWA-WEA as its second employee, only six months after the first executive director. After graduating with a B.A. in psychology from the University of North Carolina (UNC) Chapel Hill, she initially worked with the developmentally and intellectually disabled at NC ARC. “I realized what I liked best about the job was working with volunteers,” recalls Jones, adding that this was her first experience with non-profits. In November 2000, after only a year with ARC, she decided to take a leap of faith, accepting a position as administrative assistant for NC AWWA-WEA.

“Up to that point I had given no thought to water treatment,” she recalls. “I turned on the tap and flushed my toilet. That was about the gist of my water and wastewater experience. Today, I have a much better appreciation of what it takes. If everybody would have a chance to tour a facility and see the water when it comes in and what has to be done to clean it, they would pay their water bill without any complaint.”

Staffed only by Jones and Executive Director Pam Moss, NC AWWA-WEA grew quickly, creating new programs and processes. Soon the work was too much for two people and an office assistant position was created.

Nici Banks was one of the applicants. A graduate of Appalachian State University, she had started off in the music education department only to find her passion lay elsewhere. But upon graduating with a B.S. in Applied Communication in 2001, she found herself working at a credit union, in a position she quickly realized would never lead to a career. With nothing to lose, she responded to a “very vague” job posting in the local paper.

After becoming lost in downtown Raleigh – Banks has since become renowned for having no sense of direction – she finally found her way to the interview. “After I left, I figured they were either laughing at me or going to hire me,” she recalls.

By the end of the job interview, Jones and Moss knew they had found someone who was not only skilled, but also like-minded. Equipped with a degree in communications – and a keen sense of humor – Banks slid into the role of office assistant seamlessly. “When you’re working in a small office, it’s a family,” says Jones.

During her first few years, Jones was responsible for planning 50 annual seminars, four or five weeklong schools, countless committee meetings and the annual conference, as well as getting any related brochures produced and sent out. Moss interacted with the committees and attended the events. “It became too much for Pam to attend everything,” recalls Jones. “So it started to trickle down. I had the freedom to jump in, and it just turns out that working with the people and interacting with the people who come to our events is what excites me.”

Meanwhile, Banks handled registration and filing, but as Jones’ pile grew, the NC AWWA-WEA’s newest employee soon took on membership, the production of four training catalogues and quarterly newsletters, and eventually, setting up the website. “We became the right and left halves of each others brains,” says Banks of working with Jones. “The newsletter, and later the magazine, were definitely in my half.”

Increasingly busy with the education side of NC AWWA-WEA, Jones was only too glad to cleave communications from her responsibilities. Over the next few years, she developed systems to capture the knowledge, skills and abilities of volunteers in order to build a framework that would more effectively deliver a quality product to members.

Then in 2007, while Jones was on maternity leave, Banks moved out of state as her husband decided to pursue his doctorate at the University of North Texas. Banks had barely given notice and started looking for a new job in the Lone Star State when she was approached by the executive director. “Pam pointed out that everything I did could be done remotely either by Internet or by fax,” recalls Banks. “She then offered me a six month contract as Communication Coordinator.”

What was supposed to be a temporary arrangement was renewed repeatedly over the next seven years. During that time, Jones became Office Manager and Banks moved again, this time to Florida. NC AWWA-WEA also welcomed several new
staff members, including a new executive director, who was only too happy to continue the arrangement. “It was immediately apparent to me that Nici had the knowledge and skills that were vital to the success of the organization,” explains Roberts, “and she demonstrated a level of dedication and reliability that I could not imagine trying to replicate.”

When she joined NC AWWA-WEA Roberts found Jones and Banks to be an invaluable resource on what worked well and what was needed to change at NC AWWA-WEA. “I always start a new job with a series of one-on-one interviews with existing staff,” says Roberts. “I want to know what they love about their work, what support they need, have or haven’t received and what they want and need to grow and go forward. Catrice and Nici were both very clear and very blunt in providing me with those answers! Their input was a gift, as it allowed me to focus my energy on resolving issues and providing them both with the tools and support they needed.”

Roberts encouraged and supported Jones and Banks in pursuing accreditation as Certified Association Executives (CAEs). Jones became a CAE in 2014 and Banks is currently pursuing her designation. “When I first started with NC AWWA-WEA, I had a job,” says Jones. “Lindsay’s arrival prompted a series of eye-opening experiences for me. As she openly shared her knowledge and experience, my view on my job shifted and I realized I have a career. This is what I was meant to do.”

Becoming Manager of Information Technology and Training Coordinator, then Education Events Manager, Jones is now the Director of Education. The retirement of the baby boomer generation will result in a smaller workforce and fewer volunteers, making the specialized field of adult education both more challenging and more important. With more professional organizations stepping into the gap, competing to offer training, it is essential that the quality of education offered by the NC AWWA-WEA be of the highest quality. NC AWWA-WEA must be able to certify that attendees have met the Need-to-Know criteria established by the State and/or panels of experts in each discipline. “Catrice is using her experience and her growing body of knowledge to help NC AWWA-WEA meet those goals and fulfill its Vision to be “THE leading education resource for safe water in North Carolina,” says Roberts. “She is an integral part of the development and launch of the new Academy for Water Professional Development package of training, and the transition to customer-centred training in which educational packages are developed specifically to meet the educational needs as requested by utilities.”

Communication is essential to fulfilling the NC AWWA-WEA’s education mission. A strong Marketing and Communications Department ensures events are promoted and branded. “Through the website, e-News and NC Currents, Nici provides the ‘face’ for our organization,” notes Roberts.

The NC AWWA-WEA has been working hard to develop a strong brand, to engage members and to use technology to expand the reach of training, including through webinars and e-learning. “That’s what will attract younger members to NC AWWA-WEA,” notes Banks, whose departmental responsibilities include Students and Young Professionals, as well as Public Education, Water For People, and Membership Committees.

Banks is now devoting more of her time to collecting and analyzing data, determining which geographical areas and types of individuals are not represented in the membership, which programs are well received and which need improving. This information is invaluable for NC AWWA-WEA’s future planning and development.

“I am amazed to see how much NC AWWA-WEA has grown since I walked in the door,” says Jones.

During the past 15 years, the services and programs have flourished, along with the membership and the committees. That growth has been enabled by the terrific team in the office, a team that includes two members who have been with the NC AWWA-WEA from its earliest days. “I am so proud of them both,” says Roberts. “Working with them is a great privilege and a lasting pleasure.”

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General
In July of 2014, the Town of Cary started up a new type of water treatment facility that included some very advanced technologies and a new way at looking at water treatment. The Western Wake Regional Water Reclamation Facility (WWRWRF) has a plant design flow of 18 mgd and treats both domestic and industrial wastes for a population of nearly 74,000 people within the Town of Cary. Currently, the facility operates with an average daily flow of 5.1 mgd and a maximum daily flow of 7.0 mgd, with a permitted peak flow of 47.5 mgd. The projected annual operating cost of this new state-of-the-art facility is $3.9 million.

Treatment Processes
The basic treatment processes at WWRWRF includes the liquid train consisting of preliminary, secondary, and tertiary treatment processes, followed by effluent pumping. Solids removed from the liquid train are directed to an on-site Solids Building for further treatment and removal from the facility site. It should be noted that four diesel operated standby generators are available onsite in the event that the facility loses power during the treatment process. These generators will come on automatically and immediately following a power loss as needed to maintain full plant operation.

1. Preliminary Treatment: During the preliminary treatment portion of the WWRWRF, raw wastewater enters the preliminary treatment influent structure (PTIS) via two parallel pipelines. Three different channels exist in preliminary treatment, and slide gates provide isolation for each channel in the event that maintenance is required. Two of these channels contain mechanical bar screens for removal of screenings. The third channel contains a manual bar rack in times when an extreme weather flow event occurs or if both mechanical bar screens are down for maintenance.

   After the channels, the influent wastewater flow then passes through a Parshall Flume for flow measurement and then to grit removal. Actual grit that settles at the bottom of the grit collector is pumped to the cyclones/classifiers for further liquid/solids separation. In addition, the entire PTIS is covered, and foul air is pulled by a fan at the adjacent odor control facility for treatment. Hydrogen sulfide and other compounds that lead to odors in the air are removed by the bio-filter and carbon scrubber prior to being released back into the atmosphere.

   Preliminary treatment effluent (PTE) flows by gravity throughout the entire facility. From the PTIS, PTE enters the biological reactor basins (BRBs) through a BRB splitter box. It is in the splitter box that a BRB may be isolated by closing a slide gate. In addition, scum is also skimmed off the surface and directed to the scum holding tank.

2. Secondary Treatment: Preliminary treatment effluent (PTE) enters the biological reactor basins (BRBs) from the BRB splitter box via a dedicated pipeline. Each BRB is composed of nine cells, and each cell is equipped with necessary equipment to accomplish nitrification and denitrification for removal of the nutrients nitrogen and phosphorus from the wastewater. The specific zones within the facility are fermentation, anaerobic, anoxic,
Odor control biofilter carbon filter

Plant staff

SCADA system

aerobic, secondary anoxic, and reaeration, in this order. Denitrification occurs in the anoxic and post-anoxic zones of the BRB (cells 3, 4, and 8), and nitrification and phosphorus removal occur in the aerobic zones (cells 5, 6, and 7). Aeration is achieved with jet mixing equipment through air fed by turbo blowers located in the process equipment building, which is a part of the facility’s secondary treatment.

The control strategy for the biological reactor basins (BRBs) is very detailed and there are two independent control loops that exist to achieve a balanced process. A pressure loop controls the blower's starting and stopping, and also modulates the blower speed. The blower operation is based solely on a pressure setpoint that is entered into a program. In addition, the dissolved oxygen (DO) loop controls the dissolved oxygen levels in the three aerated zones. DO probes are in each of these three cells and constantly send updated signals of the DO concentration to the program. The plant operators enter a desired DO concentration for each aerated cell, and the program regulates the position of a dedicated motor-operated butterfly valve located on the air drop pipe at each of these cells. This particular process is called the dissolved oxygen zone control.

The clarifiers are located downstream of the BRBs and slide gates isolate offline clarifiers. Further solids settling occurs in these rectangular tanks equipped with chain and flight mechanisms for skimming of surface scum and pushing of heavier solids that settle to one side of the basin's floor. Scum is removed from the clarifiers in scum troughs that lead to scum pump stations. From there, the scum is pumped to the scum holding tank. Settled solids in the clarifiers called Return Activated Sludge (RAS) are transferred by pumps to the first three cells of the online BRBs. A certain amount of RAS remains in the process for proper biological treatment while the remaining RAS is wasted and removed from the site after further solids treatment. This is the main stream of the solids train.

3. Tertiary Treatment: From this point in the process, clarifier effluent flows over V-notch weirs on effluent troughs within the clarifiers and move forward to the tertiary treatment area. The first process of tertiary treatment is filtration and disc-filters are utilized at the facility, with each disc-filters consisting of cloth media and a dedicated backwash pump for media cleaning. Backwashing is automated and initiated based on either a water differential or a timer, whichever reaches its setpoint first.

At this particular point in the process, filtered effluent flows from the disc-filters to disinfection, which is achieved with ultraviolet (UV) light. The UV control program will operate two channels (i.e., by opening and closing their influent gates) and two banks of lamps located in each channel, as required to meet a design dosage of UV light for disinfection. This program will control the number of banks that are on and the percentage of power at which the lamps will operate. A third channel with banks of UV lamps exists on standby in the event that one duty channel is out of service.

The plant effluent is then directed out of disinfection to flow measurement through another Parshall Flume and then on to post aeration. Treated wastewater to be discharged into a body of water must meet permit limits for DO, and this post aeration facility ensures that the DO concentration is met. In addition, self-aspirating jet aerators impart air from the atmosphere into the water prior to effluent pumping to the river. Effluent pumping is accomplished with vertical turbine pumps that operate to maintain a wetwell level while automatically alternating based on runtime. Alarms and shutoff measures are in place should the level reach a high or low point to protect the pumps and notify plant staff of a problem.

4. Solids Processing/Handling: Solids are completely processed onsite at the WWWRWF and no digestion of solids occurs at the plant. A covered scum holding tank stores scum removed from the liquid train for a short amount of time until it may be blended with the main waste stream pumped to dewatering. Combination gravity belt thickeners/belt filter presses dewater the waste stream, resulting in a 15-16% solids cake. In addition, polymer storage and feed facilities inject activated polymer into the waste prior to entering the gravity thickening zones of the dewatering unit for solids coagulation. The resultant ‘cake’ is then pushed in a trough by screw augers and pumps through a pipeline to the cake (wet) silos for temporary holding, up to 24 hours. Finally, the cake is pumped onto conveying belts of one of two dryer units for removal.
of water resulting in a 90% or greater solids product.

Dried solids are further processed with a pelletizer to produce a marketable fertilizer. Dry silos located on the facility store these pellets until trucks are available for removal from the site. The facility also has the capability of receiving dewatered cake or thickened sludge from other treatment facilities and can process and transport these solids in addition to their own.

**Key Treatment Unit Information**

1. **Liquid Train**
   - Mechanical bar screen (JWC Finescreen Monster™); quantity: two, ¼” perforations; each can treat up to 40 mgd, 60” wide by 108” deep channel, 70-degree angle from horizontal; also consists of Screenings Washer Monster™ including grinder and washer/compactor. Screenings are discharged to dumpsters below.
   - Grit collector (Westech Grit Chamber); quantity: one, Maximum 30-day flow of 18 mgd and peak hydraulic flow of 50 mgd, 20’ diameter, 12 revolutions/min
   - Grit pumps (Fairbanks Morse Induced Flow (Recessed Impeller) Centrifugal type); quantity: three, one for influent pipe grit removal and the other two are duty/standby for the grit collector; 300 gpm
   - Grit cyclone/classifier (WESTech Vortex Grit Chamber and Gritt Mitt™ Classifier); quantity: two in duty/standby arrangement; design feed at 300 gpm; includes stainless steel shafted spiral screw with spray water and stainless steel grit discharge chutes to dumpsters below.
   - Influent and effluent parshall flumes (TRACOM); quantity: two, Nested Parshall flumes – 48” in an 84”. Nested 48” flume to be removed when maximum month flow reaches 18 mgd.
   - Odor control biofilter (Biorem), 10,000 scfm capacity with two bays each consisting of 2’ of an inorganic media followed by 4’ of an organic media, two duty/standby fans, and one carbon scrubber tank downstream of the bays.
   - Biological reactor basin (BRB) Splitter Box utilizing weirs for even flow distribution to the four BRBs (a BRB may be isolated with slide gates); consists of downward opening weir for scum removal with one submersible scum pump
   - BRBs; quantity: four, original design was a five-stage Bardenpho process; the first cell was converted into a fermentation zone to kick-start the anaerobic process.
     - Nine cells each
       - Cell 1: Fermentation zone, one submersible mixer in Cell 1
       - Cell 2: Anaerobic zone, one submersible mixer, submersible fermentation pump at end of Cell 2 recirculates flow to beginning of Cell 1.
       - Cell 3: Anoxic zone, two submersible mixers; carbon addition via Nitrified recycle (NRCY) line
   - Blowers; quantity: four (two small, two large by Neuros), Turbo style blowers, operate to maintain a pressure setpoint in the BRBs.
   - Clarifiers; quantity eight (four small, four large by Polychem), chain and flight type in rectangular basins. Consist of RAS screw auger to facilitate pumping, motor operated scum troughs, submersible scum pump stations (one per pair of clarifiers), and effluent troughs.
   - RAS Pumps (Hayward Gordon Screw Centrifugal); quantity 12; four pump stations overall, each pump station serves two clarifiers and consists of three pumps each; one pump is dedicated to a clarifier and the middle pump is standby.
   - WAS Pumps (Vogelsang Rotary Lobe), quantity: three
   - Chemical pumps: Metal salts (ferric sulfate, include two 20,000-gallon storage tanks) and sodium hypochlorite (include two 6,100-gallon storage tanks) are fed by Milton Roy diaphragm chemical feed pumps; carbon (MicroCg, include 2 9,000-gallon storage tanks)
tanks) is fed by peristaltic pumps
• Disc-filters; quantity: eight
  (Hydrotech by Kruger/Veolia),
  cloth discs in each disc-filter with
  vertical backwash pump that utilizes
  recently filtered effluent to backwash
  dedicated disc-filter when the level
  differential reaches a setpoint.
• UV disinfection (Trojan Technologies
  UV3000Plus); quantity: three
  channels; two channels will treat
  the peak flow, third channel is
  redundant. Each channel consists
  of two banks with 104 lamps in
  each bank. Level is controlled via
  motor operated downward opening
  weir gates.
• Reclaim/plant water pumps
  (Fairbanks Morse); quantity:
  three, vertical turbine type, draw
  UV disinfected effluent for plant
  wide usage.
• Post aeration (MTS Jet Aeration
  Systems); quantity: two tanks with
  self-aspirating jet aerators.
• Effluent pump station (Flowserve);
  quantity: five vertical turbine pumps
  (two small, three large) in two
  wetwells. Wetwells are connected
  via sluice gate, can be isolated if
  need arises. Pumps operate based
  on level measured by two ultrasonic
  level sensors/transmitters with
  backup low level floats. Program
  automatically alternates same size
  pumps based on runtime.

2. Solids Train
• Dewatering (Ashbrook-Simon-
  Hartley), three-belt belt filter press;
  quantity: three, feature a gravity
  belt thickening zone (one belt)
  and a pressure zone (two belts);
  gravity belt thickening can be
  used separately with thickened
  waste removed via dedicated
  progressive cavity pumps or solids
  can continue through the pressure
  zone for further dewatering and
  into a cake hopper (results in a
  15-16% cake product).
• Cake silos; quantity: two, 65 cubic
  yards storage capacity each
• Solids dryers (Kruger BioCon);
  quantity: two, 5,139 ton/year dry
  solids loading rate each
• Pelletizer (CPM); quantity: one

Other Information
1. Solids Treatment Process:
   As noted earlier, collected solids
   through the treatment process at the
   WWRWRF are thickened to about
   3% with a gravity belt thickener,
   dewatered to around 15% with a
   belt filter press, and then dried to
   about 93% in a belt dryer.
2. Bio-Solids Management
   Program: The heated dryer
   systems used at the WWRWRF are
   approved by the US Environmental
   Protection Agency (USEPA) and
   the North Carolina Department of
   Environment and Natural Resources
   (NCDENR) as systems that meet
   Class A Exceptional Quality (EQ)
   biosolids. The Town of Cary markets
   its fertilizer pellets under the name
   Enviro Gems and they are currently
   sold to a wholesaler who distributes
   the final product for use as a fertilizer
   for agricultural applications.
3. Disinfection Process: Disinfection
   at the WWRWRF is accomplished
   via ultraviolet light and includes three
   channels consisting of two banks
   of mercury amalgam lamps (two
   duty, one redundant or standby).
   The entire influent flow is treated by
   the two duty channels, as needed
   depending on the level entering the
   UV disinfection facility. In addition,
   the number of banks on and power
   level of the lamps will change by
   the dos-pacing control strategy to
   deliver a target dose of 30 mW-s/
   cm². Sodium hypochlorite storage
   and feed facilities exist only for
   addition to the RAS header, scum
   holding tank, and reclaimed water
   header.
4. Personnel: Although the WWRWRF
   is highly automated, the plant
   requires the attention of a highly
   trained operations staff. One
   Plant Manager and four other
   administrative staff are located
   at the WWRWRF for general
   administration. In addition, the
   facility has a total of 12 operation
   and maintenance employees and
   laboratory employee. As far as
   personnel development programs
   with the Town of Cary, the Career
   Ladder Professional Development
   Plan is available to the employees
   and details the necessary
   requirements to progress in their
   individual career paths. There is also
   a job-shadowing program available
   for all Town of Cary employees.
5. Unique or Difficult Problem
   Faced/Solved: The WWRWRF was
   started up under low flow conditions,
   and during the facility construction
   phase the plant staff were able to
   ensure that the process equipment
   would meet the required turn down
   for low flow conditions.

Contact Information for more on the
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Municipal Coordination

PARTNERS IN PLANNING FOR SUSTAINABLE AND SECURE WATER SUPPLIES IN THE TRIANGLE REGION

WSACC MASTER PLAN PROCESS fosters municipal cooperation in Cabarrus County

NEIGHBORS HELPING OUT THROUGH NCWATERWARN: A NORTH CAROLINA TRADITION

THE NEW REALITIES OF WATER MANAGEMENT: THE NON-REVENUE WATER SOLUTION

HOW THE CATAWBA-WATEREE WATER MANAGEMENT GROUP PLANNED FOR A SUSTAINABLE FUTURE

Summer 2015 Theme Leaders: Jonathan Ham, Town of Garner; Marie Schmader, STV, Inc; Tom Bach, City of Concord; Leslie Jones, GHD

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The Jordan Lake Partnership (JLP) was created in 2009 by local jurisdictions and water systems to jointly plan for sustainable and secure water supplies for the Triangle Region of North Carolina. Acknowledging that the Triangle was one of the fastest developing areas of the state, the leaders of local jurisdictions and water systems collaborated to develop a plan for expanded use of Jordan Lake and other regional water supply sources.

The JLP committed to work together to meet the water supply needs of individual partners while addressing the short- and long-term interests of the Region without compromising the abilities of downstream communities to meet their water supply needs. Guided by this mission, the JLP developed the Triangle Regional Water Supply Plan (TRWSP) to meet the 50-year water needs of the 13 regional partners. The document is the first of its kind in the Triangle Region and represents an historic consensus among multiple regional jurisdictions about the present status and long-term needs of the Region’s water supply resources.

**PROCESS**
A key driver for creation of the JLP and, ultimately the TRWSP was the historic drought of 2007 – 2008, which demonstrated the fragility of Neuse basin water supplies and the relative drought tolerance of Jordan Lake. This led to the JLP focusing on the potential reallocation of Jordan Lake to provide a more sustainable water supply for the region. Allocation decisions for Jordan Lake are made by the NC Environmental Management Commission (EMC) based on recommendations of the NC Department of Environment and Natural Resources (NCDENR) Division of Water Resources (DWR). In the three previous rounds of Jordan Lake water supply allocations, local water systems competed for the available supply, with the EMC ultimately deciding on the final allocations. The JLP members believed they could achieve better outcomes by working together to craft a plan to share the water. By taking a previously competitive process, and working collaboratively to develop a regional solution, local water systems improved their self-determination while also improving the reliability and resiliency of...
their water supplies through cooperation and enhanced system interconnections.

As part of the regional water supply planning process, JLP members developed a mutually supported plan for meeting the future water supply needs of the Triangle Region. They supported each other through a careful peer review of each other’s demand projections, shared information about conservation and water efficiency efforts, coordinated inter-utility infrastructure planning efforts, and developed an expanded pool of potential water source options. The goals of this regional water supply planning effort were to agree on the future service areas, sources, and needs of the Region’s water systems; analyze strategies for meeting needs; and recommend a water supply alternative for the Region.

The peer review process was a key element of the regional water supply planning effort. Each partner presented its projection methodology and assumptions to the whole group. Partners offered questions and critiques, and also submitted anonymous peer review evaluations of each system’s projections. Each system then revised its projections, often multiple times, based on feedback from peer review evaluations.

Transparency and peer review helped to standardize the definitions of certain water use sectors and set reasonable expectations for the magnitude of certain uses like flushing and water treatment process use. Transparency of demand projections allowed partners to compare their projections with others, and, more importantly, peer sharing and review of methodology helped partners strengthen underlying assumptions and improve the projections. The resulting projections represent the most complete long-term picture of the Region’s demands compiled to date. Through multiple rounds of review and refinement, the partners achieved a 10-15% reduction in projected regional water demands, and established more reliable, defensible projections for use in water supply alternative analysis.

With realistic demand projections established, the JLP’s next step was to develop a suite of potential options for meeting those demands. This process included:

- identifying the full breadth of potential sources,
- developing frameworks of specific high-level objectives that had to be met,
- creating multiple combinations or collections of sources within each framework,
- determining water supply alternatives by establishing the timing of future sources,
- analyzing and screening alternatives and establishing preferences,
- choosing a preferred alternative, and
- modeling the scenarios and evaluating impacts.

This innovative and replicable stepwise process began with identifying all potential individual water source options from each partner and compiling them into one source option spreadsheet tool. The next step was to develop a set of overall frameworks to set the general characteristics and high-level objectives of an alternatives analysis. The frameworks included utilizing each individual system’s base preference, minimizing new supply sources, maximizing new sources, minimizing the number and size of new sources, using only new sources developed by JLP members, using a large new source, maximizing cooperation, and the no-action alternative. Utilizing this process of setting an overall objective helped partners approach the

**REGIONAL DEMAND PROJECTIONS, CURRENT SUPPLY, AND REDUCTIONS DUE TO PEER REVIEW**
task from different angles and generate creative solutions. For each framework, an innovative source selection spreadsheet tool was used to select the collections of sources that could be used to meet the future 2060 water needs while satisfying the objective of the framework. A major benefit of this collaborative planning was that it expanded the range of potential solutions to the regional water supply needs by including water supply alternatives too large or too impractical for a single system to plan, much less build.

Next, the JLP members developed, refined, and discussed the relative merits of each option. Each partner rated every collection of sources from the perspective of its individual water system. Based on the overall ratings, options with low scores were eliminated. More complete alternatives were then developed by ensuring water needs were met for each partner in all intervening years. In 2014, the JLP came to a consensus on a single, preferred regional alternative, referred to as the JLP Recommended Alternative, to meet the future water supply needs of the region. This JLP Recommended Alternative forms the foundation of the TRWSP.

The JLP Recommended Alternative is specific to the needs, available sources, and preferences of the members of the Jordan Lake Partnership, but the process employed to develop it is a replicable one that can serve as a model for other municipalities working together to meet future regional water supply needs. The innovative tools developed through this process are a remarkable output in and of themselves.

INNOVATIONS
The two-volume TRWSP is a long-range, 50-year cooperative water supply plan and is the first of its kind for the Region. Numerous innovations were developed through this effort, including new processes and tools such as the source selection dashboard shown on page 43. The JLP had a collaborative vision for the future of water supply in the Region, and several key principles guided the process.

Mutual support: The JLP members participated in this process to ensure a secure water supply for the Region and each individual member. The Recommended Alternative needed consensus support, so if any component of the plan was not acceptable to a partner, the plan was refined further until all partners could agree.
“THE JLP HAD A COLLABORATIVE VISION FOR THE FUTURE OF THE WATER SUPPLY IN THE REGION, AND SEVERAL KEY PRINCIPLES GUIDED THE PROCESS.”

Transparency and Mutual Accountability: The JLP’s process of peer review for projections and proposed water supply alternatives ensured a high level of transparency. Each partner presented information to other partners and responded to concerns and suggestions raised by the other partners.

Collaboration and Openness to new ideas: For the sake of expanding the range of potential regional water supply planning options, partners had to be open to ideas that were outside their individual planning boundaries.
Data-driven decision-making: The Partnership members were committed to using the best available data and tools to evaluate potential water supply options. This insistence on high data standards and using the best tools available at times slowed the decision-making process down, but ultimately led to better decisions.

Sustained commitment: JLP members realize that actually implementing these water supply plans will require sustained commitment. Through ongoing collaboration, partners will support one another in the implementation of individual components of the water supply plan.

RESULTS

The Partnership demonstrated that local governments can work together in a cooperative fashion with their peers in the Region, with constituent organizations, with upstream and downstream jurisdictions, and with regulators to create environmentally sustainable, secure, and mutually beneficial water supply strategies for the Triangle Region.

The Jordan Lake Partnership’s regional water supply planning process helped to standardize the definitions of certain water use sectors. The transparency of demand projections allowed systems to compare their projections with other systems, and peer sharing and review of methodology helped the systems strengthen underlying assumptions and improve the projections. The more accurate demand projections gave the partners a firmer starting point for analyzing potential water supply alternatives, and the reduced overall demands made finding viable alternatives much easier. The accrued benefits of mutual accountability and transparency also carried over in the working relationship between partners for the regional alternatives analysis.

The collaborative planning also expanded the range of potential solutions to the regional water supply...
MUNICIPAL COORDINATION

needs. Developing options that compel the utilities to examine how to meet water needs from a broader, regional perspective created a different lens through which to view the relative benefits and shortcomings of existing options.

Many systems projected a continuing decrease in water usage rates, and some systems’ success with reducing their per capita demand convinced other systems in the Region that achieving similar gains was achievable.

The trust developed through the JLP enabled communication about preferences, concerns, and objections to water supply options to be discussed more openly. Partners were up-front about why they supported some alternatives over others in their local planning. More importantly, partners could articulate which alternatives being considered by other partners

PROJECTED CHANGES IN SURPLUS AND DEFICIT (MGD) FOR THE JLP MEMBERS 2010-2060

@ Cellular, Web-Based Monitoring System
@ Alarm/Event Notifications via SMS and or E-Mail
@ Continuous 24/7 Monitoring /Diagnostics
@ No Dedicated Computers or Software Required
@ System Design Based on 30 + Years of Experience
@ Pump Station / Elevated Tank Monitoring

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@ 14 Digital Inputs
@ 2 Analog Inputs
@ 4 Relay Outputs
caused them the most concern. Clear explanations of causes for concern with well-reasoned justifications helped partners focus on the most viable sources and not waste too much time analyzing options that could not win support from the whole Partnership. Similarly, strong preferences for particular sources by a few partners helped make decisions between otherwise comparable source options easier.

The planning efforts also investigated where interconnections among the JLP members’ water systems could be improved both from engineering and inter-local agreement standpoints, which improved the reliability and resiliency of the Region’s water sources.

Through the collaborative planning of the JLP, 11 partners submitted coordinated individual requests for Jordan Lake water supply allocations in 2014. The requests were all consistent with the Recommended Regional Water Supply Alternative in the TRWSP, ensuring that requests did not exceed the available supply or impair downstream users from meeting their future water need or face water shortages under the 80+ year range of recorded hydrologic conditions.

**PATH FORWARD**

While the Partnership’s original objective has been achieved, the collaboration process has strengthened the trust between partners and has clearly demonstrated the value of information sharing. The Memorandum of Understanding (MOU) has been extended through 2019 and the City of Fayetteville – a downstream user – has been invited to become a member of the JLP. Members continue to meet regularly as the elements of the TRWSP are implemented, such as the ongoing interconnection study to determine the engineering capacity to move water among and between the individual systems. In addition to Jordan Lake allocation requests, four Partnership

**INTER-UTILITY WATER SUPPLY AGREEMENTS**

“ELEVEN PARTNERS SUBMITTED COORDINATED INDIVIDUAL REQUESTS FOR JORDAN LAKE WATER SUPPLY ALLOCATIONS IN 2014.”
MUNICIPAL COORDINATION

Members are exploring opportunities to jointly share in the costs and development of facilities to access the Jordan Lake water supply, including a regional intake and water treatment plant on the western side of the lake.

Each JLP member has been responsible for obtaining endorsement of its participation in the Partnership and for the TRWSP from city managers and councils. By engaging municipal leaders as well, the Jordan Lake Partnership has expanded the scope of stakeholders involved in jointly planning the future of the Region’s water supply and helped develop and strengthen relationships between jurisdictions beyond the level of technical staff.

Not only is water supply a fundamental need, it is a critical driver for economic prosperity and community growth. Through this collaborative planning process, water systems in the Triangle Region worked together to develop a range of solutions. A consensus recommended alternatives to meet the needs of this growing region and ensure adequate and sustainable water supplies for the future. This historic document and the unparalleled level of joint planning and collaboration that went into its creation are a phenomenal asset to the Region, one which will provide mutual benefits long into the future and that can serve as a national model of collaboration and joint regional water supply planning.

ABOUT THE AUTHORS
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Don Greeley (don.greeley@durhamnc.gov) is the director for the City of Durham Department of Water Management and serves as the chair of the Jordan Lake Partnership.

“WATER SYSTEMS IN THE TRIANGLE REGION WORKED TOGETHER TO DEVELOP A RANGE OF SOLUTIONS.”
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WSACC Master Plan Process Fosters Municipal Cooperation in Cabarrus County

BY LESLIE JONES, PE, BCEE, GHD; JAKE PETROSKY AND MEG NEALON, LANDDESIGN; CHUCK WILLIS, PE, BCEE, WILLIS ENGINEERS; AND TIM KISER, PE, WSACC

BACKGROUND
Cabarrus County has been one of the fastest growing areas in North Carolina over the past several decades. In order to adequately plan for rising utility demands, the Water and Sewer Authority of Cabarrus County (WSACC) developed the FY 2012-2013 Master Plan (master plan) to guide future investment in regionally significant water and sewer infrastructure. WSACC is somewhat unique among wastewater system operators. Rather than providing service to individual customers, WSACC provides ‘wholesale’ service to the four major municipal utility providers in Cabarrus County (Concord, Harrisburg, Kannapolis and Mount Pleasant) and Charlotte Water. WSACC also operates Lake Don T. Howell on Coddle Creek, which serves as one of the primary water sources for the cities of Concord and Kannapolis. WSACC operates and maintains the Rocky River Regional Wastewater Treatment Plant (RRRWWTP) with a permitted capacity of 26.5 mgd, along with the Muddy Creek Wastewater Treatment Plant (MCWWTP), permitted to 150,000 gpd. In addition, WSACC currently operates and maintains approximately 116 miles of interceptor sewer, ranging in size from 12 inches in diameter to 72 inches in diameter, and five remote pump stations that transport wastewater to the RRRWWTP and the MCWWTP. Finally, WSACC operates for Mt. Pleasant the Mt. Pleasant Water treatment Plant (MPWTP) with a current capacity of 1.0 mgd. In providing these services, WSACC also acts as an important planning agency to assist the member jurisdictions in managing water and wastewater resources throughout the county.
The team of consultants, led by GHD and supported by LandDesign and Willis Engineers (project team), facilitated the planning process. The master plan is meant to determine major utility infrastructure needs in Cabarrus County and a portion of Rowan County between 2013 and the plan horizon year of 2040.

The project team utilized an integrated planning approach by combining stakeholder involvement, traditional long-term master planning methodologies, and innovative utility demand forecasting to help assess future needs. This article focuses on the process used to develop the master plan and, specifically, the inter-jurisdictional coordination that led to a successful plan.

**NEED FOR A NEW APPROACH**

Cabarrus County has grown by over 100,000 people since 1980. Projections indicate that there will be demand for an additional 50,000 new homes and 38,000 jobs by 2040. Looming growth, in combination with the 2008-2009 drought, led to concerns over future water and sewer capacity. Recent infrastructure investments and changes in growth patterns were not anticipated when the previous master plan was completed in 2002. In addition, software, forecasting methods, available GIS data, and regional cooperation of municipal utility providers have increased dramatically since the development of the last plan. These realities led WSACC and the project team to create a new approach for developing a master plan that relied on more input from municipal and county partners. In addition to the traditional components of a utility master plan, including an asset management plan and an analysis of facility needs, the plan included an accounting of current water and wastewater usage trends across jurisdictions, an innovative approach to modeling future utility demand, and a regional water supply analysis. An integrated approach that involved local and regional stakeholders, as well as experts in utilities, demographics, GIS, and land use planning, was key to accomplishing these tasks. The approach allowed for an inter-disciplinary solution to meeting future utility needs for multiple jurisdictions that operate independently but have a shared interest in adequate regional facilities.
STAKEHOLDER INVOLVEMENT
The master plan and its components were developed over a 10-month period with regular input from a technical team of stakeholders, comprised of representatives of WSACC member jurisdictions (Cabarrus County, City of Concord, Town of Harrisburg, City of Kannapolis, Town of Midland, and Town of Mount Pleasant). These stakeholders included planners and utility managers who provided direct feedback on components of the Plan, and reviewed draft forecasts to ensure consistency with local efforts. Cooperation with local staff was also critical to producing a plan that included maintenance recommendations that will help keep the plan current and relevant.

MODELING FUTURE UTILITY DEMAND
The growth demand forecasting process began by creating an accurate accounting of existing land use and water usage rates. Data for 51,000 meters was provided by municipal retail providers, standardized and spatially located (geocoded). This enabled the development of generalized utility usage rates based on recent, local data. The process of data conflation provided a snapshot of regional water usage that did not exist before the master plan. In addition, it will enable WSACC to coordinate with municipal utilities to better monitor usage trends in the future.

A custom, parcel level, probability-based model was then created to forecast future utility demand. The WSACC Growth Model was developed by LandDesign using GIS datasets and software (ArcGIS and CommunityViz® Scenario 360™). The model creates disaggregate dwelling unit and employment forecasts by determining the distribution of future growth based on adopted land use policy and suitability of available land. The major components of the model and model results are discussed in the sections below.

Land Supply
Based on tax parcel records and stakeholder review, an inventory of available land (vacant or undeveloped) and underutilized land (land likely to be redeveloped or support additional development) was created. The available and underutilized land in combination, less environmentally constrained areas, is referred to as the ‘land supply.’ The land supply is a discretely measurable amount of acreage that could accommodate anticipated growth in new housing and non-residential uses. As part of the land supply, an inventory of pending development was created based on data provided by Cabarrus County. This inventory represents approved developments, including over 18,500 new dwelling units that are anticipated to be complete prior to the 2040 planning horizon. The land supply dataset was used by the model to determine where new
development could be allocated and can assist jurisdictions in a variety of planning efforts where there is a need to quantify the amount of acreage available for future development. The pending development inventory can be maintained and used as an asset by member governments for ongoing work. Pending development can also be summarized by basin and used to inform local and regional Capital Improvement Plan (CIP) updates.

**Generalized Future Land Use**
Currently adopted local land use plans were collected and used to create a set of generalized future land use categories. Each category has an associated set of allowable uses and densities (residential density and non-residential “floor area ratio”). These categories were used by the model to determine the capacity of land to accommodate future development. Municipal and county planners assisted with the development of the generalized land use categories and their assignment to parcels. This was no small task, given that the study area included seven jurisdictions, which necessitated the review of 14 land use plans and policy documents and the translation of a total of 122 zoning and future land use classes into a common framework. In the end, it ensured that density assumptions in the utility demand forecasts reflect existing county and municipal land use plans and agreements for utility provision. This component of the model could be adjusted by WSACC or stakeholders to test the potential impact of land use plan changes or proposed developments on aggregate water and/or wastewater demand.

**Suitability Analysis**
Land suitability represents the likelihood that a parcel will experience growth by 2040 (the plan horizon year). No two parcels are exactly the same, and the set of characteristics associated with each will determine its attractiveness, or suitability, for certain uses. A number of economic and environmental suitability factors were taken into account in the development of the WSACC growth model. These factors vary based on land use type. Suitability analyses were conducted for two types of residential land uses (single family and multi-family) and five types of non-residential land uses (commercial, service, industrial, office/institutional/government, and lodging). The suitability analysis can be used during land use plan updates to determine the appropriate locations for non-residential development. It can also be helpful when determining which areas of a jurisdiction are likely to experience growth.

**Results**
The model was used to create parcel-based forecasts. Forecasts were created based on a 2040 horizon year and five-year increments, and aggregated to water and sewer basins. In total, it is forecasted that residential and non-residential growth in the study area could result in 14.1 mgd in new demand. The forecasts from the growth model were placed into a wastewater transportation model developed by Willis Engineers and used to determine demand by water and sewer basin and infrastructure upgrades and
extensions needed for WSACC-owned regional facilities. The disaggregate forecasts can also be used by municipal governments for planning purposes and/or to inform investment decisions. For instance, utility departments could use the forecasts to determine potential demand in a sub-watershed to help determine the size needed for a locally maintained water or sewer line. Member governments may also use the model to investigate potential implications of approval of a regionally significant development or land use plan update on utility demand. With some customization, the model could also be used to test potential impacts on schools, other municipal services, or natural resources.

**BENEFITS / SUMMARY**

WSACC’s master plan not only helped foster teamwork across all the municipal jurisdictions within Cabarrus County, but it also provided several tools that can be utilized on a regular basis. The stakeholders now have access to several components of the growth model used in the overall master plan that will assist them in preparing the county’s infrastructure for the expected future growth. The master plan’s components can be updated periodically to account for changes in local land use policy and development trends. This allows the master plan to function as a dynamic decision tool to assist in understanding capacity, as well as regulatory and demand issues, and avoids being relegated to a one-time analysis and set of recommendations that quickly become obsolete.

**ACKNOWLEDGEMENTS**

The consultant team acknowledges the extensive support and assistance provided by the WSACC staff and the staff of each of the member jurisdictions. A tremendous amount of data was collected as part of this evaluation, requiring considerable staff time. Likewise, the utility staff for each jurisdiction has participated in both the development of the water supply analysis and the projection of future demand. Without their assistance, this evaluation would not have been possible.

**ABOUT THE AUTHORS**

Leslie Jones is a project manager at GHD in Charlotte. Jake Petrosky is an associate at LandDesign. Meg Nealon is a partner at LandDesign. Chuck Willis is president of Willis Engineers. Tim Kiser is the engineering director at WSACC.
When an emergency happens to your water or wastewater utility, who can you turn to for help? What if you need a generator, a specialized team familiar with distribution or collection systems, or an extra piece of equipment unique to the water and wastewater industry in time of crisis? The importance of a mutual aid program is apparent by the emphasis given to the subject by the Environmental Protection Agency’s (EPA) National Incident Management System (NIMS) Objectives for the Water Sector. Out of 17 performance goals for building a strong emergency management plan, participation in a WARN program is mentioned in four of the categories. WARN is an acronym for Water Assistance Response Network, applying equally to water and wastewater utilities. All 50 states have some type of WARN mutual aid program as a component of the state’s disaster assistance program.

The North Carolina Water and Wastewater Agency Response Network (NCWaterWARN) is the mutual aid and assistance program for our state. This network of member utilities helps others respond to and recover from emergencies, both natural and human caused. Voluntary members of NCWaterWARN, both public and private, can work independently of state government to assist members during an emergency. Participation in the program provides expedited access to the specialized resources needed. Currently, there are 96 member organizations geographically dispersed across North Carolina.

The NC AWWA-WEA took a leadership role with support from the NC Department of Environment and Natural Resources (DENR), NC Emergency Management (EM), NC Rural Water Association (RWA), NC Water Treatment Operators Association (WTOA), and the NC League of Municipalities (LM) to develop and implement the program after a series of strong hurricanes impacted our state in the late 1990s.

The NCWaterWARN Agreement is the legal instrument authorizing the exchange of resources. This agreement identifies the administration of the program, directs how to access mutual aid/assistance, specifies reimbursement procedures, and authorizes the creation of the Operations Plan (OPLAN). Workmen’s compensation and indemnification have been considered and are identified in the membership contract. The OPLAN provides the guidance for requesting assistance and activation; that is, providing assistance to another utility that requests help. In addition, this OPLAN provides the framework for all aspects of supporting mutual aid. It starts with the assumption the utility already has a functioning emergency response plan in place, its employees are trained to certain minimum NIMS/ICS standards, and the member utility has categorized its teams and equipment per National AWWA Standards. Greater details regarding logistics of deploying teams, staging equipment, tracking costs and many other items are outlined in the forms and appendices contained in the OPLAN.

Both water and wastewater utilities are encouraged to develop local mutual aid agreements with nearby (similar) public works departments, governments, and jurisdictions, as they are probably able to respond faster. However, NCWaterWARN members may have the specialized teams and equipment that only other water/wastewater utilities may be able to provide. Having a local mutual aid agreement in place, as well as being a member of NCWaterWARN, provides an additional layer of protection.

Once a member of NCWaterWARN, utilities should consider the tactics of responding to an activation request. One question may be how can they shorten the turnaround time for response by having policies and procedures in place to support a deployment of one of their teams? Conversely, what are the ‘trip-wires’ or triggers for requesting assistance?
In addition, at what point does a utility determine that they need help, and do they know how to quantify their need in a rapid fashion? Without these details in place, it is more likely the utility will be unable to provide assistance to those in need, or have the appropriate measures in place to ask for help.

While no formal activations or requests for assistance have occurred in North Carolina since the inception of the program, it’s more a case of when, and not if it will happen. With the exception of some tropical storms that have skirted the Outer Banks, North Carolina has not had a serious hurricane event with accompanying flooding and storm surge in over 15 years.

NCWaterWARN enjoys strong support by the NC Division of Emergency Management (DEM). When the State’s Emergency Operations Center (EOC) is activated, NCWaterWARN representatives will have a seat at the table inside the EOC, and can coordinate mutual aid support efforts along with the Infrastructure Services Section. In addition, NCWaterWARN staff has also participated in numerous statewide exercises and workshops to increase the readiness of our water and wastewater utilities across the state.

NCWaterWARN has a new website hosted by the NC AWWA-WEA, and this website has information about joining the program and a member map reflecting current utility membership. Information on resources such as no-cost software, tools supporting emergency response planning and training are available at www.ncwaterwarn.org. Mutual aid is very much like an insurance policy. You hope you will never need to use it, but if necessary, you will be glad you have it.

Would you like to join and/or get involved in the program as a regional coordinator? For more information about the program and what it has to offer, please visit our new website previously referenced. Contact information for Mike Richardson, Chairman, and Eric Hatcher, Secretary of NCWaterWARN is listed on the website, along with many other tips and tools we hope will be of assistance to your utility.

ABOUT THE AUTHOR

Eric Hatcher, Emergency Management Coordinator for the Cape Fear Public Utility Authority in Wilmington, NC, also serves as the Secretary of NCWaterWARN. He has extensive experience in emergency management, and a strong proponent of the use of NIMS/ICS principles in the water sector. The Cape Fear Public Utility Authority has been the recipient of NC AWWA-WEA’s Disaster Preparedness Award (large utility category) three times since its formation in 2008.
Water utilities are under game-changing pressures today from internal and external forces. Just ask any water utility in California. Where, once, water was plentiful, there are serious droughts and unprecedented dramatic usage restrictions. Where, once, regulations were voluntary and without restrictions, they are getting stricter, with mandatory conservation measures. Where, once, consumers didn’t worry about water consumption, conservation is now becoming more of a habit. Where, once, cheap water was considered the goal, real value pricing is now a hot topic of conversation. Where, once, utilities were not expected to operate under the same best practices of competitive businesses, water-saving strategies and efficiencies in utility business cases are now expected. Due to the confluence of these pressures, water utilities, today, cannot continue to operate as they have in the past. New questions about water management must be asked, and new solutions must be offered to shore up the future.

One of those questions should and must involve non-revenue water – managing and minimizing lost water and recovering lost revenue. Studies show that non-revenue water totals in the trillions of gallons every year, taking billions of dollars out of the potential revenue stream. Here are the key facts:

- Nationally, over 2 trillion gallons per year are classified as non-revenue water, costing water utilities billions of dollars.
- Up to 75% of current water losses in systems are recoverable.\(^1\)
- The average utility has more than 33,000 gallons of water per year and $35 per connection per year in non-revenue water, costing utilities millions of dollars, according to the American Water Works Association (AWWA) Water Audit Data Initiative. For example, a 50,000-connection water utility could be losing $1.8 million in non-revenue water every year.\(^2\)

From both financial and environmental viewpoints, we simply cannot afford to ignore non-revenue water any longer. Inefficient systems, inaccurate methods of measurement and substandard policies, as well as inaccurate data, must be relegated to the past, and a new era of openness, accuracy and economics must take its rightful place.

**MAKING THE TRANSITION**

One of the easiest, most important places to start on a non-revenue water initiative is by asking the right questions. In this case, let’s start with just one question: How are you measuring your non-revenue water? For years, the answer was nearly universal – water that was unaccounted for was based on a percentage of total system input volume. But this measurement is highly inaccurate when overall volume increases or decreases based on demand.

In the example in Figure 1, water losses in 2001 are around 3 mgd and show steady increases since the utility has no water loss control program. In 2008, a major industry moves to the area and begins using more water. Water losses are still on the rise as new leaks begin and existing meters degrade. Fast forward to today, and after 13 years of unmanaged water loss, that number has doubled from 3 mgd to 6 mgd, yet the percentage of system input volume lost tells a more positive but misleading total.

In fact, measuring non-revenue water using this metric is no longer considered the correct method. More than a decade ago, in 2003, the AWWA abandoned this practice, yet many water utilities continue to use it, perhaps unaware that there are now preferred optimized and accurate data validation tools that yield precise measurements and lead to actionable results.

*The first question water utility leaders should ask is, “How am I measuring Non-Revenue Water?” If the answer is by percent of system input volume, it’s time to abandon that inaccurate metric and utilize more meaningful metrics from the M36 water audit.*

A second step is to take a look back at past actions to minimize and manage non-revenue water. Many utilities assume that most non-revenue water comes from leaks and inaccurate metering. Naturally, the default solutions have been to replace pipes and meters. But all too often, after investing in expensive repairs and new equipment, the end result is missed expectations.

**FIGURE 1**

![Image of water loss chart](image-url)
That is because those same utilities skipped a critical phase – the diagnosis phase – and jumped straight into implementation despite the fact they have no clear and definitive understanding of the problem's source. It is an understandable situation – there are numerous sophisticated technologies available to address leaks and metering – and the inclination is to get straight to the fix. But here's the problem: when the prescribed solution doesn't address the real issue, the result is disappointment and frustration, and in extreme cases, changes in utility leadership and personnel when improvement is not realized.

The second question is this: Do I truly have a clear understanding of the cause of non-revenue water at my utility? If the answer is no, it is time to find out. Both AWWA and EPA recommend water utilities follow a three-step process to minimize and manage non-revenue water: auditing, intervention and evaluation. This process ensures utilities can determine their baseline water use and loss, prioritize the most important water efficiency projects and define operational changes to implement, and then measure the results with an eye on continuous improvement.

Figure 2 illustrates the three-step process outlined for the State of Georgia, a leader in water loss control. As accurate information is gathered and acted on, verifiable long-term reductions are realized. Audit, validation, and real improvement take time.

Because of the proactive measures it has taken to control its water loss, the State of Georgia is now recognized as a leader in water resources management. In the recent Statewide Water Audit Training Program, this three-step process provided the roadmap, ensuring accurate information was gathered, analyzed, and acted on. Water utilities there anticipate long-term reductions, and should realize measurable improvements, saving two-thirds of lost water within seven years.

**TAKING ACTION**

Today, there are highly accurate tools that measure all three categories of non-revenue water to provide a much more actionable perspective than simply a percentage of total volume. A good place to start is with free audit software developed by AWWA. By utilizing this powerful tool, water utility managers will finally have clear data on billed authorized consumption, unbilled authorized consumption, and apparent losses.

A memorable way to think about it is the three Vs: Validity, Volume, and Value. Until the threes have been determined, the right tools or solutions cannot be chosen.

Validity refers to the AWWA audit system’s rating scale, from 1 to 100, to correctly assess a utility’s performance. The objective is to accurately reflect the utility’s current state to provide a valid baseline. Many utilities have found that additional training on using AWWA audit software results in more accurate data as well as a better user experience for utility employees. So this step should be considered an important one.

"BOTH AWWA AND EPA RECOMMEND WATER UTILITIES FOLLOW A THREE-STEP PROCESS TO MINIMIZE AND MANAGE NON-REVENUE WATER: AUDITING, INTERVENTION AND EVALUATION."
PROUDLY REPRESENTING THE FOLLOWING MANUFACTURERS

Wastewater Systems
Packaged Grinder Pump Stations for Pressure Sewer Collection Systems

Lagoon Aeration and Treatment Equipment
Fusion Wastewater Treatment Pump
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Volume is no longer a generic measurement of percentage of total volume. Instead, each category of non-revenue water is quantified by class, providing utility managers specific data they have never had before. With an accurate picture, utility managers can then make more informed decisions and achieve greater results.

Figure 3 illustrates how many utilities currently measure non-revenue water as simply a percentage of system input volume. Figure 4 illustrates new levels of detail by NRW category volume and value utilizing AWWA's M36 free audit software. By using an audit, utility managers can see non-revenue water data with new clarity to inform better decisions and create a more effective plan.

Finally, the value of non-revenue water can be calculated with greater precision to determine market worth. Often total non-revenue water can add up to significant dollars. Assuming annual losses per connection of $35:

- A 15,000-connection water utility could recover $525,000 each year.
- A 30,000-connection water utility could recover $1.05 million each year.
- A 55,000-connection water utility could recover $1.925 million each year.

In today's economic climate, utilities are faced with operating budget cuts, fewer resources, rising performance expectations, and resistance to consumer rate increases. These non-revenue water figures translate to thousands of dollars of welcome savings to help ease some of the strain.

**SEEING POSITIVE RESULTS**

When water utilities follow this simple prescription of measuring and understanding validity, volume and value to tackle their non-revenue water challenges, the results can be dramatic, as shown in Figure 5. In the State of Georgia, in 2012, water utilities serving a population of greater than 3,300 embarked upon a Non-Revenue Water Program. Within one year, they saw a 4% statewide reduction, or a validated 2.5 billion gallons, with an economic value of nearly $2 million.

In the Georgia program, improvements were evident in all three non-revenue water categories, reducing total non-revenue water loss to 67 billion gallons, down from 70 billion. For small utilities, average water validity scores ranged from 31 to 81, with an average of 52.1. Larger systems tended to score a little better, with performance rankings from 38 to 81, with an average of 62.9.

Take Asheville, NC as another example. This 56,000-connection water utility began battling non-revenue water in 2012 when it realized losses were mounting and something had to be done. “We were still using percentages, which is an inaccurate benchmark,” said Ivan Thomas, the Asheville Water Department Operations Manager. “We reported our water loss at around 30%. We needed a water audit to break our non-revenue water down in terms of validity, volumes and values. When we did this, we really started to see where we were and what needed immediate attention.”

Using AWWA water audit software, the utility learned its water and related revenue loss ranked 68 on the validity scale. Then, with valid data in hand, the utility began a full-scale assault on its non-revenue water problem, including leak detection, valve exercising, meter testing, unbilled customers, pressure reduction and zone metering. Today, Asheville has seen a 1 mgd reduction and recovered nearly $100,000 a year from its water management measures.
THE TIME TO ACT IS NOW
Unfortunately, many water utilities do not see the value in pursuing non-revenue water initiatives. But the truth is, there are costs associated with not addressing non-revenue water, and that cost will do nothing but escalate with every delay. For those who continue to ignore the signs or postpone programs, those costs include natural resource depletion, increased regulatory mandates (both funded and unfunded), and, eventually, public pressure from concerned consumers. The old business model simply doesn’t work in the face of today’s business, environmental, and regulatory climate.

One way to begin charting a better future for water utilities is to accurately assess non-revenue water and implement interventional programs. The Georgia and Asheville systems prove the case: when you are armed with the right data upfront, you can make more informed, responsible decisions. You can benchmark progress and improve the bottom line. You can actually improve the performance of your water utility.

So, if your water utility is not actively pursuing non-revenue water, it is time to consider it, before you are forced to do so by outside parties, thereby losing control of the process. Take the first steps forward toward stewardship of your water resources, and you can begin to see what is possible.

ABOUT THE AUTHOR
For almost three decades Steve Cavanaugh (steve.cavanaugh@cavanaughsolutions.com) has worked with public and private sector clients to develop intelligent environmental stewardship solutions to some of today’s most challenging issues. In addition to his agricultural expertise on waste-to-energy and biomass facilities, Steve is known in the industry as an expert in the field of water loss and revenue recovery, and has dedicated his life to teaching utilities how to discover and embrace efficient business practices. Steve is a member of International Water Association – Water Loss Specialist Group and Chair of AWWA WLCC Outreach Subcommittee.

NOTES
2 AWWA Water Audit Data Initiative: www.awwa.org/waterlosscontrol
3 Based on 226 water utilities in Georgia

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Communities along one of the hardest working rivers in the Carolinas have an approaching problem. Without significant effort to manage water consumption, this generation could see a time when there will not be enough water flowing in the Catawba-Wateree River to support more people moving into the heart of North or South Carolina. Not enough water to ensure growth and economic development in the region and supply more electricity to drive new industry. Not enough water to ensure the quality of life we currently enjoy.

The Catawba-Wateree Water Management Group (CWWMG) has worked with stakeholders for over four years to address this complex issue. Through much collaboration, we have designed a basin-wide Water Supply Master Plan that can help ensure our water supply will sustain the growing needs of the region into the next century.

The Water Supply Master Plan is the most significant water supply management and planning endeavor undertaken in the Catawba-Wateree River Basin since original construction of the 11-reservoir system in the 1900s. Once implemented, it will provide the following regional benefits:

- Dependable, resilient, regional water supply that can support more than two million people and a vibrant, growing economy.
- Efficient, balanced water use to produce electricity to power the region.
- Environmental protection in accordance with agreements developed during Duke Energy’s Federal Energy Regulatory Commission hydro relicensing process.
- A shared regional vision and implementation plan for coordinated investments in the region’s shared water future.

The Water Supply Master Plan includes:

- Input and guidance from a 19-member public stakeholder team representing environmental interests, lake users, various local governments and state agencies.
- Updated long-term water use projections in the basin (to the Year 2065).
- Evaluation of numerous options to extend the available water supply.
- New long-term basin-wide strategies to ensure sustainable water supplies for decades beyond current expectations.

The CWWMG is a non-profit corporation founded in 2007 to identify, fund, and manage projects that will enhance the capabilities of the Catawba-Wateree River to provide water resources for human needs (e.g., water supply, power production, industry, agriculture, and commerce), while maintaining the river’s ecological health. The CWWMG serves the 4,750-square-mile Catawba-Wateree River watershed from Lake Wateree upstream, providing water for communities from Morganton, NC to Camden, SC and supplying water to approximately one-fourth of Duke Energy’s power generation capacity in the Carolinas.

In addition to the collaborative leadership of the 19-member CWWMG, this project included an external Stakeholder Advisory Team (SAT). The SAT allows for advisory level input by key organizations that have an interest in the future planning efforts for the basin. The CWWMG’s intent for the SAT was to ensure a broader level of input from a diverse group of interested stakeholders. Furthermore, the SAT was asked to help broadly communicate the recommendations and conclusions of the Master Plan and work as an advocate for full implementation.

Funding for Water Supply Master Plan was provided by the State of North Carolina, the State of South Carolina, the Duke Energy Foundation and by the CWWMG through dues paid by its member organizations.

The CWWMG and its consultants, HDR Engineering and McKim & Creed, first worked to understand the hydrology and demands on the Catawba-Wateree River system. From there, the team collected information about water supply management and enhancement strategies from across the country and around the world and applied it to the 11 Catawba-Wateree reservoirs. The team used complex planning tools (including a sophisticated computer model, climate change predictions, and water use efficiency methods) to evaluate practical options that could become parts of a plan that works for the region. This team also significantly upgraded the water quantity computer model previously developed during the Catawba-Wateree Hydro Project relicensing process.

While the region is not technically running out of water, the amount of water we currently have available has been modeled and may not sustain further population growth and development past about 2050. The Water Supply Master Plan calls for a series of balanced measures throughout the basin designed to: 1) make more water available, 2) use water more efficiently, and 3) continue to improve our basin wide response to, and management of, droughts. With these measures in place, the system has been modeled to provide sustained water yield for growth and economic development in the region into the next century.

Once published, the CWWMG undertook a public outreach effort that included a press release, numerous public presentations, and other external communications. The CWWMG also sought resolutions of support for the Water Supply Master Plan from the governing bodies of each of the CWWMG members. This initial public outreach effort has allowed for extensive input by other regional stakeholders regarding the Master Plan. To date, more than 50 public presentations, media interviews, publications, and other communications have been completed.

The complete plan is available at www.catawbawatereewmg.org.
Public Drinking Water Utilities

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- City of Camden
- Catawba River Water Supply Project (Union County, NC/Lancaster County, SC)
- Charlotte Water
- Chester Metropolitan District
- City of Gastonia
- Town of Granite Falls
- City of Hickory
- City of Lenoir
- Lincoln County
- Town of Long View
- Lugoff-Elgin Water Authority
- Town of Mooresville
- City of Morganton
- City of Mount Holly
- City of Rock Hill
- City of Statesville
- Town of Valdese

www.ncsafewater.org
One month since the January 2015 Declaration of National Disaster following the worst flooding in Malawi, over 1.15 million people across 15 districts have been affected by the floods – double earlier estimates. And now 230,000 people are in temporary shelters provided by government and bilateral organizations such as United Nations International Children’s Emergency Fund (UNICEF). One of the shelters is situated in Chabuka, a rural village in Chikhwawa, holding 1,570 men, women, and children.

On a clear-sky day during the first week of February, the Regional Manager, Country Director, and I went down on a reconnaissance mission and material distribution exercise in Chabuka camp.

As we travelled down the winding tarmac road through the lush valleys and hills leading to the flat lands of Chikhwawa, it was impossible to ignore the vibrant flourishing greens and rich earthy browns of nature that greeted our eyes on that vertigo-inducing trip. The magnificent view from our vantage point, as we descended the hills, was picturesque – a postcard image of a quintessential Southern African plain with wide expanses of vegetation and a river running through it. It was alluringly therapeutic – Tolkienesque even.

If Only That Was All There Was to It

As we hit the plain and tore down the tarmac road heading towards the main town, we immediately saw what the greens and browns were hiding in plain sight: collapsed mud-huts with people still living in them, naked children playing obliviously in pools of stagnant algae-covered water, and scenes of villagers reburying the bones of their dead that had been exhumed by the floods. The lushness of Mother Nature felt misplaced against all this misery punctuating the roadside as we journeyed onwards to visit the Chabuka camp to see what conditions the Internally Displaced Persons—a term I had just learned is abbreviated to IDPs—were living under.

Judging by the countless trucks carrying supplies, and the United Nations (UN) license plates swarming up and down the road into Chikhwawa, it was clear that we were entering the epicenter of the one of worst hit districts in the country.

Upon arrival we attended a Water Sanitation and Hygiene (WASH) cluster stakeholders meeting where all players, including Water For People—Malawi, gathered to deliberate the overall coordination of the relief efforts in the camps from a water and sanitation perspective.

It was clear from the meeting that a lot was going on and a lot was getting done despite various logistical challenges, including impassable roads, inadequate resources, and headcount irregularities.

Toilets were being constructed. Water points were being drilled. Some water points were rehabilitated. Shelters were being erected. Mosquito nets were being distributed.

Relatively speaking, everything seemed under control. During the course of the meeting, a question was welling up inside my mind that I couldn’t shake off—a question that wouldn’t let me go. When the time for Questions & Answers came, I raised my hand:

“Are any of us using existing supply chains, for example water mechanics and sanitation entrepreneurs, to construct or rehabilitate the water and sanitation infrastructure during this three-month emergency phase, or are we doing that ourselves as organizations?”

Malawi in Recovery

By Muthi Nhlema, Water For People Communications & Monitoring Specialist

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After a brief moment of silence as I looked around the table for an answer, one person at the table simply mouthed to me “Good question,” but nobody answered.

“Maybe it is too early to be thinking about this,” I thought to myself, and left it alone.

After the meeting we continued our journey to Chabuka where a throng of excited people were waiting for the buckets and cups we had come to distribute. For us, the experience went beyond providing relief, because we got to see the faces and names behind that alienating abbreviation we had read in so many reports – IDPs.

Once the formalities of handing over the buckets and cups to the camp committee were underway, I took a stroll around the camp to survey the site, take pictures and, basically, become a disaster tourist. The camp was a hive of empty tarpaulin tents that were too hot in the Chikhwawa heat to sleep in; wooden latrines with plastic slabs and wooden frames enveloped in black sheeting counted as bathrooms. For some strange reason, I noticed a Non-Government Official (NGO) sticker stuck on the door of one of the latrines – never a bad time for brand development you might say.

And like the misplaced vibrancy of the greens and browns that met us on our way down the hill, I was met with defiant smiles of children, as they sat playing in the dirt next to their tarpaulin homes labelled “ANA” (vernacular for children), and older women cooking wild shrubs for lunch.

One of the women, upon seeing me with my camera dangling like a medallion around my neck, jumped up with such juvenile spunk and shouted, “You! Take my picture!” as she struck a pose with a cheeky thumbs-up, as if to say, “We will not let this beat us down.”

“There is an interna-
tional nonprofit organization dedicated to providing access to improved water and sanitation systems and services in developing countries. By working with local governments, the private sector, and partners, Water For People ensures that everyone in a specific region has these basic needs met forever. This innovative approach reaches every family, every school, and every clinic, catalyzing transformative change for better health and economic development to occur. www.ncsafewater.org

Hello,” I said. “Can I take your picture, nganga?” (Nganga is a term of respect for senior citizens mostly used in rural settings in Malawi.)

“No problem,” he replied, as I started clicking away oblivious to the ululation in the background as the bucket handover ceremony kicked into gear.

“This is beautiful. How much do you plan to sell it for?” I asked, stroking the reed mat. “About MWK1, 200.00,” he responded. This amount equates to about $2.50 in US dollars.

“Are you overcharging because I am a guest here?”

“Maybe,” he smirked.

“What is your occupation?”

“I’m a carpenter.”

“Oh!” I exclaimed, excited. “Then you must be the one who constructed those latrines over there,” I said, pointing to the NGO-branded latrine over yonder.

Nganga shook his head, “No, I wasn’t.”

At that moment, as I had a brewing amount of questions, one of my colleagues shouted for me to rush over and photograph the official handover of the buckets and the moment when the Country Director pledged a new borehole for the displaced population in the camp.

I didn’t see Nganga after that. But then again, I didn’t have to.

As we left the camp and the district of Chikhwawa that late afternoon, I noticed that the swarm of vehicles had not abated. As I watched them, carrying supplies, experts and expats, I knew — deep down I knew — all of this was making a difference to the displaced populations in Chikhwawa. I wanted to believe that.

But I couldn’t help but feel that nagging question, rising to a boil inside of me again, breeding more questions, and I felt something else. I felt unsure, concerned even.

Could we be undermining existing service providers, like Nganga, who could probably just as easily provide a particular service to the relief effort and, subsequently, rebuild their own livelihood? Are we creating dependencies on development agencies that would eventually weaken existing relationships between local communities, service providers and, possibly, institutions?

Maybe it’s too early to say or criticize, but I chose to hold my assumptions lightly and remain on the side of caution for the time being.

As we ascended the winding road up the hill again, I looked down at the Chikhwawa flat lands as they disappeared, hidden from view by the vibrant greens and rich browns of nature. As the valley reassumed its picturesque form, I noticed a small dark cloud on the horizon, like a small fist unfurling in the distance, and prayed it wasn’t rain.

WATER FOR PEOPLE is an international nonprofit organization dedicated to providing access to improved water and sanitation systems and services in developing countries. By working with local governments, the private sector, and partners, Water For People ensures that everyone in a specific region has these basic needs met forever. This innovative approach reaches every family, every school, and every clinic, catalyzing transformative change for better health and economic development to occur.

Golf Tournament

If you would like to support Water For People’s efforts locally, the NC AWWA-WEA Water For People Committee is hosting its 19th Annual Golf Tournament at the Colonial Country Club in Thomasville, NC on Friday, September 11, 2015. You and your company can become a supporter of this event either by sponsoring at one of our three levels, or by registering as a player! Visit www.ncsafewater.org and follow links to the WFP Golf Tournament page for more information. All net proceeds for this event are sent to Water For People to support their international program work.

As the bucket handover ceremony kicked into gear, attracting more of the camp-folk as it did, I noticed an old man seated in the dirt, disinterested in the proceedings and completely obsessed with a reed mat he was weaving. What struck me at first were the man’s intense features and how the wrinkles on his face seemed to carve a life story all on their own. I needed to get his picture!
We have come a long way. The concept of an endowment fund to provide monetary scholarships to support the water industry was officially presented to NC AWWA - WEA in 2008. At that time, the Carol Bond scholarship fund was already established with the help of the City of Raleigh and the NC AWWA – WEA Public Education Committee. This scholarship fund targets community college students studying environmental sciences or environmental education and honors the memory of Carol Bond. Carol was an employee of the City of Raleigh and was an advocate for public education about water, wastewater, and the environment.

There are several approaches to funding scholarships in the non-profit world. The most common approaches are:

1. pay as you go from the organization’s annual budget;
2. pay as you go using specific fund-raising events;
3. a combination of those approaches (1) and (2) which establishes a reserve fund combined with pay as you go that balances out the lean and prosperous years; and
4. an endowment fund that protects the principal and funds scholarships based on the earnings of the protected funds.

Early in the investigation of the pros and cons of establishing a scholarship fund, the Endowment Committee examined the nature of our Association. Our consultant indicated that the lack of a philanthropic culture within the Association promised to make fund-raising difficult. After much investigation and deliberation, the Association decided that the most sustainable model for funding scholarships is the endowment concept.

This approach immediately creates its own set of difficulties. No funds are immediately available for distribution. Therefore, the fundraising efforts are not able to demonstrate an immediate result. This creates a challenge to fundraising just as planting a shade tree provides only a promise of future rest.

Considering that the Association began the discussions about seven years ago, things have happened quickly. Success breeds success, so the newly established fund needed some seed money. In 2009, the Board of Trustees voted to allocate a $25,000 transfer from the Association reserve to create the NC Safewater Fund and another $25,000 transfer from the Carol Bond Fund to establish the Carol Bond Scholarship Fund. From those humble beginnings fundraising efforts have increased the total donations and pledges to almost $400,000 or about a 700% increase in value in six years. About $230,000 was raised in donations and pledges for nine more named funds. The remainder was collected from individuals who have donated in various amounts, through raffles, cash donations, and auctions.

Recognizing the importance of the effort, the Board of Trustees has dedicated the costs of administrative support within the Association operating budget. Over the past five years this support has added up to about $123,000. The endowment funds are managed through the Triangle Community Foundation. Investments are conservative, but in this strong economic climate the gains on investment have provided earnings for the award of scholarships. In 2015, the Association is able to award 10 scholarships totaling $12,500.

While this is exciting, the Board of Trustees has challenged the Endowment Committee. The Board would like to see less emphasis on fundraising, more emphasis on member engagement, and eventually larger, more significant scholarship awards rather than more numbers of scholarships. While the Association maintains ownership and control of the endowment through the Board, membership is disconnected from the purpose of the endowment. The Board feels that it is important to find significant sources of financial investment, and it is equally important to engage every member. There are opportunities for volunteerism and donations, but more importantly there are opportunities for members to benefit from the distribution of scholarship funds.

Several topics have been discussed over the past year that relate to the endowment fund and the roles of the Board of Trustees, the role of the Endowment Committee, and the NC AWWA-WEA membership. To reset the table it is important to keep in mind that the purpose of the endowment is to enhance the sustainability of the water profession by providing educational opportunities encompassing various levels of the profession across various areas of interest. The focus on education is consistent with the Strategic Plan.

1. Any fund-raising goals must be realistic. To achieve any goal, it must have the broadest possible base. The Association has placed an interactive DONATE button on the Scholarship webpage [www.ncsafewater.org]. The growth of the funds will not occur without ownership by the members. The endowment creates tangible
results that can improve our industry’s future and reward the desire to make a difference.

2. **The Board provides clear and consistent guidance to the Endowment Committee.** The Board insists that the endowment offers potential benefit to our membership. The Endowment Committee asked three requests from the Board. The first request was to have 100% participation of Board members contributing to the endowment. The second is to continue to fund the administrative costs for the endowment to allow 100% of the donations to go to the generation of earnings for scholarships. The third request is to consider a donation to the endowment from the Association general fund on an annual basis. With this help from the Board, the endowment will be able to grow.

3. **The Endowment Committee has challenged every member of the Endowment Committee to contribute to the fund, for 100% participation.** The Endowment Committee recognizes the importance and need for clear reporting of activities, successes, and outcomes. The committee is focused on making an impact on the training and education of members and nonmembers who will then contribute to the future of the water industry.

4. **The Endowment Committee partners with Water For People to combine efforts and maximize results.** A framework for that relationship is that the Endowment is philanthropy internal to the profession. Water For People is an external display of philanthropy to help others throughout the world. The committee pledges to work closely with Water For People to improve the impact of our Association both within and beyond our organization.

5. **Softly, softly catch monkey.** That was a phrase I brought back from my Peace Corps service. Our versions are slowly but surely, easy does it, or one step at a time. The power of our membership is that the impact of member donations can be amazing. Suddenly, $10 a year becomes $30,000, $50 a year becomes $150,000 if each member gives. Any size gift is greatly appreciated. This will allow for larger awards and new scholarship opportunities. Our membership could create a fund specifically for family members through directed donations.

**What is next?** Every Association member needs to realize ownership in the endowment fund. The Endowment Committee, the Board of Trustees, and every member, need to share both the fund-raising effort and the opportunities for people to tap into the benefits. The more successful we are in making a difference, the more sustainable our industry will be. The endowment offers an answer to the question: Who will replace you when you retire?

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Questions provided by the NC AWWA-WEA Water Board of Education and Examiners

1. ___________ breakage may occur when a pipe is unevenly supported along its length.
   a) Shear  b) Beam  c) Pressure  d) External load

2. Hydrants where the operating nut and outlet nozzles are encased in a box with a removable cover that is at the ground surface level are known as ___________.
   a) dry-barrel hydrants  b) warm-climate hydrants  c) wet-barrel hydrants  d) flush hydrants

3. ___________ can tip the balance in favor of a badly needed bond issue.
   a) True  b) False

4. An Emergency Response Plan should be revised at least every ____ years.
   a) 5  b) 3  c) 2  d) 1

Answers:
1. b) 4th ed. p. 19
2. d) 4th ed. p. 167
3. a) 4th ed. p. 477
4. c) 4th ed. p. 473

CERTIFICATION INFORMATION

If you have any questions regarding operator/engineering certification and exams, please contact the appropriate agency.

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This section of NC Currents serves as a forum for operations and maintenance workers to seek answers and solutions to problems and challenges through the insights and experiences of fellow operations-maintenance experts and professionals. All operations-maintenance workers and professionals are welcome to submit questions or answer the questions as part of this forum. You can submit your questions or answers to nbanks@ncsafeewater.org. Everyone that submits a question or an answer will be entered into a drawing for a $50 gift card!

**Question:** What is pump cavitation and are there ways to reduce or eliminate it?

**Answer:** Cavitation occurs when vapor bubbles (cavities) form within the pump and subsequently collapse. Collapsing bubbles are tiny implosions and, when in contact with an impeller, can degrade the impeller, reducing pump performance and possibly resulting in pump failure. Often times, the implosion sound leads one to believe the pump is pumping rocks. The pump may also vibrate. The severity of cavitation depends upon net positive suction head available (NPSHa) at the pump, distance between operating point, and the best efficiency point on the pump curve and energy level at the pump. Some methods to reduce or eliminate cavitation include: increasing the wet well water level (increasing NPSHa), increasing suction pipe size to reduce inlet losses, changing impeller type to achieve a lower net positive suction head required (NPSHr) value, adding variable frequency drives to reduce pump speed, using alternative impeller materials less susceptible to damage, and replacing a pump with one that has a lower NPSHr.

**Question:** What are some common distribution system pipe materials?

**Answer:** Send your response to nbanks@ncsafeewater.org and it may be printed in a future issue of NC Currents.

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The aeration process in an activated sludge wastewater treatment plant can consume up to 60 percent of a plant’s power usage.

"We reduced our power consumption using Siemens Turblex blowers and DO control resulting in direct payback of our capital investment.”
- Don Seilinger, North Charleston Sewer District
At the 2014 Annual Conference in Winston-Salem, North Carolina, the NC AWWA-WEA presented its fourth North Carolina Collection System of the Year Award (CSOY) and second Water Distribution System of the Year Award (WDSOY). A total of 18 applications were received and reviewed for last year’s awards as seen here.

The awards were highly competitive and all applicants demonstrated that they are proactive in the operation and maintenance of their sanitary sewer collection systems and/or their water distribution system. In four years of the CSOY, applications have been submitted by 16 different sanitary sewer collection systems from all across the state. In the two years of the WDSOY, applications have been submitted by 10 different water distribution systems from all across the state.

**Collection System of the Year**
- Brunswick County
- Charlotte Water
- City of Concord
- Durham County
- City of Greenville
- Town of Hillsborough
- Town of Mooresville
- Orange County Water & Sewer Authority
- City of Raleigh
- City of Winston-Salem

**Water Distribution System of the Year**
- City of Asheville
- Brunswick County
- Charlotte Water
- City of Greenville
- Town of Mooresville
- Orange County Water & Sewer Authority
- City of Raleigh
- City of Winston-Salem

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2014 National Award Winners

NC AWWA-WEA's awards program honors dedicated members and water/wastewater professionals across North Carolina. Many of our local award winners are also nominated for awards given by our parent organizations, the American Water Works Association (AWWA) and the Water Environment Federation (WEF). Congratulations to the following North Carolinians who received recognition at the national level in 2014.

**WEF Outstanding Contribution to Water Environment by Non-Member**

Presented to an individual who has demonstrated commitment, leadership, and understanding of significant water environment issues, providing an outstanding improvement in the water environment at the local, regional, national or international level.

William (Bill) Holman, The Conservation Fund
Mr. Holman is the North Carolina State Director at the Conservation Fund; Director of State Policy at the Nicholas Institute for Environmental Policy Solutions at Duke University and has been an outstanding advocate for the water environment and those who work to serve and protect it.

The Conservation Fund and its partners obtain public and private funding for land conservation and sustainable economic development projects, and Mr. Holman has made a particular emphasis on increasing public support and funding to protect and restore water quality and quantity in drinking water reservoirs.

At the Nicholas Institute for Environmental Policy Solutions at Duke University, where Mr. Holman was the Director of State Policy, he worked on state water allocation policy, water infrastructure financing, green infrastructure and the planning for an adaptation to climate change and state energy policy.

For more than two decades, Mr. Holman has given his professional life and much of his personal time and energy to promoting a healthy and sustainable environment, seeking policy solutions, pursuing innovative thought, promoting better understanding and sharing his knowledge and experience through teaching.

**Abel Wolman Award of Excellence**

Recognizes those whose careers in the water works industry exemplify vision, creativity, and excellent professional performance characteristic of Abel Wolman’s long and productive career.

Phil Singer, UNC Chapel Hill
Dr. Singer has contributed substantially to the drinking water industry for 40 years. He has directly assisted many utilities in North Carolina and nationally on water quality issues and regulatory compliance. His vision and creativity are exemplified by his creation of the Drinking Water Research Center in the School of Public Health at UNC and his service as the Center’s Director.

Dr. Singer’s professional research has helped establish appropriate drinking water regulations and advanced the state of the art. He has published 115 refereed journal publications; edited two books; mentored 13 PhD students and 85 MS students, many of whom are now leaders in the water industry; advised EPA in its development of regulations and advanced the industry particularly on disinfection byproducts, one of the most impactful regulations utilities have faced. His work contributed to the EPA's identification of coagulation as a best available control technology for disinfection byproducts (DBPs). His later research helped establish the percent total organic carbon removal numbers and the ultraviolet absorbance criteria in the Stage 1 rule on DBPs. Since that time, he has worked extensively with the use of alternative oxidants and disinfectants, most notably ozone, for the treatment of drinking water; the formation and occurrence of haloacetic acids, a second principal byproduct of drinking water.
cholorination; factors influencing the formation of DBPs, most notably pH and the characteristics of the natural organic material precursors; enhancing coagulation for the removal of DBP precursors; and use of a novel anion exchange process for the removal of dissolved organic carbon and bromide.

He and his students have received numerous awards for their work. Dr. Singer has served as either the Principal Investigator or Co-Principal Investigator of 60 research contracts and grants with a total funding of about $11.5 million over his 35-year academic career advancing the water profession.

Outstanding Service to AWWA

This award was established to recognize and honor a member of the Association who has demonstrated outstanding service to the Association through leadership and active participation in AWWA programs.

Anthony (Terry) Rolan
Terry Rolan has been a leader in water and wastewater at the city, state, national, and international levels and has served as President of AWWA. He has dedicated his entire career to the protection of public health and safety as well as all of the other core values that utilities bring to their customers.

AWWA Heroism Award

Recognizes an act of heroism where water utility professionals place themselves at risk to aid someone else.

Darlene Barnwell, City of Asheville
While walking her dog on the evening of May 28, 2013, Darlene was approached by a frantic autistic mother who could not find her eight-year old autistic boy. Darlene searched her street asking people along the way if they had seen the boy.

At the end of the street the sounds of dogs barking drew Darlene into a neighbor’s yard. She saw the boy inside a dog pen, being tossed around like a toy by four large dogs. The boy was covered in blood. With no regard for her own safety, she climbed over the fence, knowing at a minimum she could draw the dogs off of the boy and onto herself. She ordered the dogs to stop, which they immediately did, scooped up the boy, and climbed back over the fence. Neighbors had called 911 and Darlene handed the boy over to the first responders. Darlene was treated at the scene for minor cuts and scrapes.

Darlene did not think twice about helping the woman find her child or about putting herself in harm’s way to get the little boy away from the dogs. She just took action. Darlene’s actions were heroic; her mother claims she saved his life, the child had to have 72 staples in his head and his ear reattached. She demonstrated human kindness to a stranger and put herself in harm’s way because it was the right thing to do. These actions set a strong example of what we want the community to know about the individuals who work for the City.

AWWA Section Education Award

Recognizes initiatives that educate water industry personnel, the public, students, or other groups about water and to disseminate guidelines to enable other AWWA Sections to conduct comparable educational activities.

NC Section mobile backflow trailer for cross connection training
The backflow trailer is a hands-on training unit for NC AWWA-WEA, housed in a mobile trailer with eight pressurized test stands that have been piped with backflow preventers. This mobile unit provides valuable hands-on training to compliment classroom instruction, on the operation and testing of pressure vacuum breakers, double check valves, and reduced pressure principle backflow preventers. We specially recognize Mark Krouse for his exception leadership in developing this training program.

AWWA Meritorious Operator of the Year

Recognition of special performance.

Mark Krouse, Charlotte Mecklenburg Utility Department
Mark Krouse has spent 29 years working for Charlotte Mecklenburg Utilities. His professional expertise is in the Backflow Prevention Area and presently serves as an Environmental Program Coordinator. He is in charge of an industry-leading program that protects the community’s drinking water (10,000-15,000 customers) through required installation and regular inspection of backflow prevention assemblies on certain types of water service connections. His team also monitors and works with commercial companies that draw water from 16,000+ public hydrants. He shares his professional knowledge and experience throughout the industry with his participation in NC AWWA-WEA, and is a founding member of the North Carolina ABPA chapter.

Mark has been instrumental in developing a hands-on training unit for NC AWWA-WEA, housed in a mobile trailer with eight pressurized test stands that have been piped with backflow preventers. This mobile unit provides valuable hands-on training to compliment classroom instruction, on the operation and testing of pressure vacuum breakers, double check valves, and reduced pressure principle backflow preventers.

Mark accomplishes his mission by using a partnership approach; taking extra steps to educate customers about why the rules are necessary and showing them how to comply.
The 14th Annual Spring Conference was held April 12-14, 2015 and attracted 318 attendees from across North Carolina. As the tagline Spring Into Operation suggests, one of the goals of this conference was to enhance the conference experience for operation and maintenance professionals. Many of the presentations in water, wastewater, special topics, and operations & maintenance tracks emphasized topics that would be of interest to operations and maintenance personnel. The operations & maintenance track was organized by the Plant Operations & Maintenance Committee, and used a mix of presentations, demonstrations, and hands-on training to cover a variety of topics. During Monday morning’s Opening Session, Eric Hatcher, Emergency Management Coordinator for the Cape Fear Public Utility Authority, discussed the Situational Awareness Related to Utility Emergency Response Planning. The focus of Tuesday afternoon was wireless communication in the water/wastewater industry. The exhibit hall was replaced with ongoing demonstrations allowing folks to have a ‘hands on’ learning experience. The Spring Social on Monday evening returned to its original location poolside at the Hilton Wilmington Riverside hotel, and was a great, relaxing event with live music from Ray Cox (Highfill Infrastructure Engineering and NC AWWA-WEA Member), and a corn hole tournament, which was won by Mark Barnett, the owner of Hydrostructures.

The 14th Annual Spring Conference will make a jump across the state to Asheville and will take place April 17-19, 2016. Please mark your calendars and don’t miss out! If you have a great idea or project you would like to present next spring, watch for the Call For Presentations that should be available this fall.

Thank you to everyone who worked on the 2015 conference planning committee, including the exhibitors and sponsors!
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Welcome New Members!

The following people became members of NC AWWA-WEA in January, February, and March of 2015 by joining AWWA or WEF and choosing NC as their home state or as an additional membership state, or by joining at the state level with a NC SLAM membership. We welcome these professionals to NC AWWA-WEA and look forward to seeing them at future events and working with them on various projects and committees.

For information on how to join, and the membership options available, please visit [www.ncsafewater.org/?page=Membership](http://www.ncsafewater.org/?page=Membership). Most of NC AWWA-WEA’s work is carried out through committees. To learn more about each committee review the list of active committees at [www.ncsafewater.org/?page=Committees](http://www.ncsafewater.org/?page=Committees). To express your interest in learning more about a committee, contact the committee chair directly, contact the NC AWWA-WEA office, or complete the online volunteer form.

American Water Works Association (AWWA)
Robert Anderson, Eco-Site
Brandon Ashton, AH Environmental Engineering PC
Josephine Babuin
Brent Bent, City of Rocky Mount
JJ Byerly, City of Statesville
Eric Chavis, McGill Associates
John Clemmer
Hannah Doherty, Duke University
Derek Dussek, HDR
Evan Forney, UNC - Charlotte
Jeremy Godfrey, City of Asheville
Keith Gonzales, BGA Energy
Optimization Solutions, Inc.
Michael Goralczyk
Ben Green
Clinton Ingram, UNC Charlotte (Student)
Brandon Johnson, Town of Laurel Park
Marcus Jones, County of Henderson
David Lee, AH Environmental Engineering PC
Barbara Moranta, CDM Smith
Ike Moss, Khafra Engineering
Cameron Okie
Jeffrey Privott, Veolia
David Rowland, Two Rivers Utilities-West
Edmund Sinnott
Jana Stewart, Stantec
Jeffrey Stines, Town of Waynesville
Mary Tchamkina
Will Troxler, UNC-C
Ling Wang, NC State University
Shonda White, City of Raleigh
Michael Wilson, WSACC
Mengjun Yu, Duke University
Mark Ziman, Graduate Student
At Duke University
Eco-Site (Organizational member)
Henderson County Utilities (Organizational member)
Town of Laurel Park (Organizational member)

Water Environment Federation (WEF)
Timmy Corpening, City of Morganton
Clare Griffith
Anna Griggs, Deangelo Brothers Inc.
Lamya King, Hazen & Sawyer
Tony McCulley, Hydrostructures Inc.
Crystal Penton, City of Durham
Jeffrey Privott, Veolia
Richard Sanchez, Evoqua
Water Technologies
Danny Smith, Charlotte Water
Rebecca Turner, WK Dickson
Dieter Weinert, Huber Technology
Tom Williams, City of Brevard
Thomas Worley-Morse, Hazen and Sawyer

NC SLAM
Melissa Achterman, Pilgrim’s
Johnny Adcock, City of Durham
Allison Andrews, Highhill Infrastructure Engineering
Brandon Battle, City of Goldsboro
Jennifer Bray, Town of Hockerton
Julian Brooks, City of Winston-Salem
Robbie Carpenter, Town of Wadesboro
Mike Clontz
Anthony Cook, Kruger Inc.
Bill Deal, Town of Franklin
Kyle DiMario, City of Greensboro
Rick Dixon, City of Winston-Salem
Blake Elliott, City of Goldsboro
Thomas Fleming, City of Raleigh
Kevin Gooding, PPG Protective & Marine Coatings
Trevor Green
Mandy Hall, NCRWA
Jim Harris, Pender County Utilities
Rita Haynes, PPG Industries
Fiber Glass Products
Mike House, WEG Electric Corp
Arnold Jarrell, Charlotte Water
Reggie Johnson, City of Durham
Scott Jones, Fleming Engineering, Inc.

Brian Keas, Harnett County
Joshua Lester, City of Winston-Salem
Zach Lewis, City of Winston-Salem
David Loftis, City of Greensboro
Adrian Loper, Utilities Inc.
Antonio Martinez, City of Winston-Salem
Larry McMillan, NERL-USEPA
Brandon McMinn, Trevco
Jacob Messmer, Charlotte Water
Mark Miller, Microbac Laboratories, Inc.
Heather Mullis, Charlotte Water
Mike Myers, Lincoln County Public Works
Oren Patton
Tony Pickett, City of Durham
Lane Pollard, City of Raleigh
Scott Roberts, City of Gastonia
Kyle Robinson, Utilities Inc.
Puma Rodriguez, City of Durham
Richard Sanchez, Evoqua
Water Technologies
Justin Sanderson, Onslow Water & Sewer Authority
Timmy Sapp, City of Raleigh
Freddie Scronce, Lincoln County Public Works
Rick Sherrod Jr, Greenville Utilities Commission
Matt Skidmore, Black & Veatch
Otis Tucker III, City of Raleigh
Jeff White, DuPont-Kinston
Preston Whitley, Charlotte Water
Dare Wiley, City of Washington
Rudy Williams
Tim Yount, Sunstates Security
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Willingness to Serve
The Nominating Committee is looking for members with a good knowledge of NC AWWA-WEA, commitment to the water/wastewater industry, strong leadership skills, and a desire to serve on the 2015-2016 NC AWWA-WEA Board of Trustees. To nominate yourself or someone else, complete the 2015-2016 Willingness to Serve form, available at www.ncsafewater.org, and return it to Nominating Committee Chair Jackie Jarrell by July 31, 2015.

To learn more about NC AWWA-WEA’s nomination and election process, as well as the roles and responsibilities of Board of Trustee’s members, refer to the following documents which are all available at www.ncsafewater.org; Bylaws Provisions for Elections, Nominating Criteria, and Board of Trustees Job Descriptions.

Kickoff Classes for The Academy for Water Professional Development
The Academy for Water Professional Development is a new initiative of the Association to fill an industry training gap and advance the careers of participants. The program includes multi-year technical and soft-skill training courses, which have been developed based on input from industry leaders across North Carolina. We are releasing the first phase of courses on July 13-14 in Morganton, NC during the Collection/Distribution School.

Registration for the courses listed below will open with registration for the July Collection & Distribution School. Course descriptions are available on The Academy web page.

Monday, July 13, 2015 (six-hour continuing education credit); Basic Utility Safety and Field Operations Safety Awareness and Foundations of Leadership: Customer Service
Tuesday, July 14, 2015 (six-hour continuing education credit); Support Systems Awareness for Collections and Distributions Operations and Foundations of Leadership: Effective Self-Management

Members Update Profile for 2015 Directory
NC AWWA-WEA’s next Membership Directory & Buyers Guide will be available in January 2016 as a part of the Winter 2016 issue of NC Currents. So that we can print the most accurate information for all of our members we are asking you to verify and update your contact information by October 1. The easiest way to view and update the information we have for you is to login using the Information Update Form available at www.ncsafewater.org. The username and password you will need are the same username and password that you use to register for NC AWWA-WEA events. If you have forgotten your user name or password use the ‘Forgot your password’ option to look them up using your email address. If you are unable to login, contact the NC AWWA-WEA office at (919) 784-9030.

Corporate Support of NC AWWA-WEA
While many of our sponsorship options have already sold out, there are still opportunities available, specifically for events at the Annual Conference as well as sponsorship of our popular GROW events and upcoming seminar and Institute programs. To find out what is still available and submit your sponsorship visit www.ncsafewater.org/?page=SponsorIndex.

Sponsorship is not the only way your organization can support NC AWWA-WEA and their mission to provide water education, training and leadership to protect public health and the environment. You should also consider some of the activities listed below.

Wastewater Operators Committee at mwiseman@ci.asheboro.nc.us.

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News and Notes

- Become a member of NC AWWA-WEA and encourage your employees to join.
- Volunteer, or encourage your employees to volunteer with a committee.
- Present at one of our schools, seminars or institute programs.
- Submit an abstract for consideration for our Annual Conference program.
- Contribute to NC Currents quarterly magazine by submitting an article, press release, or advertisement.
- Participate or sponsor one of NC Water For People’s 5k races or golf tournament.
- Make a donation to the NC Safewater Endowment Fund.
- Donate auction or raffle items to the events held annually by NC Water For People and the NC Safewater Endowment fund committee at the November Annual Conference.
- Exhibit at the Annual Conference or a Collection & Distribution School Student Banquet.

March GROW

March 2015 GROW event at Rush Hour Karting in Garner.

AWWA & WEF Meetings

NC AWWA-WEA External Committee Services Coordinator Erin Mallis represented NC AWWA-WEA in February in Denver, CO at AWWA’s annual Membership Summit. For meeting AWWA’s membership challenge our section received an incentive of $350. Congratulations to our members, and specifically the Membership Services Committee for meeting this goal.

Directors Award
City of Raleigh – D.E. Benton Water Treatment Plant

10-Year Directors Award
Harnett County Department of Public Utilities – Harnett County Regional Water Treatment Plant
Orange Water and Sewer Authority – Jones Ferry Road Water Treatment Plant

Directors Award – Distribution System Program
Charlotte-Mecklenburg Utilities

Correction to Life Member List
NC AWWA-WEA apologizes that Don Francisco and Anthony “Terry” Rolan were not included on the AWWA Life Members List on pages 81-82 of the Spring issue of NC Currents.

Special Delivery
Maggie and Steve Macomber are the proud parents of a baby boy, Charles Anderson Macomber, born March 12, 2015 at 5:10 am, 7lbs 5oz. Mom and baby are doing well.

Mr. Wilkinson Obituary
To the many colleagues and friends of Bob Wilkinson, it is with sad hearts we must tell you that Bob passed away on Friday, November 28, 2014. Bob’s wife of 67 years, Ramona, passed away on Wednesday, November 26, 2014. A joint funeral service was held on Sunday, November 30, 2014.

Bob spent many years devoted to our industry and for those of us who had the pleasure of knowing him and working with him, I am sure we all have fond memories of Bob and will always remember him as a generous man who took time to help all.

Bob was an NC AWWA-WEA member from 1/1/1967 to 3/1/2012 and became an AWWA Life Member. During his time as an NC AWWA-WEA member, he received the NC AWWA-WEA Chair’s Outstanding Service Award (now called the Kasey Monroe Outstanding Service Award) in 1973. It is believed he was the first recipient of this award.

Partnership for Safe Water

2014 Winners
The Partnership is an unprecedented alliance of six prestigious drinking water organizations. The Partnership’s mission is to improve the quality of water delivered to customers by optimizing water system operations. The Partnership offers self-assessment and optimization programs so that operators, managers and administrators have the tools to improve performance above and beyond even proposed regulatory levels. Learn more at www.awwa.org/resources-tools/water-and-wastewater-utility-management/partnership-for-safe-water.aspx.

Several members of the NC AWWA-WEA Board of Trustees and staff attended AWWA’s Regional Meeting of Section Officers (RMSO) in March in Key Largo, FL. During the training, NC’s Greg Morgan and Brian Tripp presented NC AWWA-WEA’s new Academy For Water Professional Development program to attendees from other AWWA sections.

During WEF’s WEFMAX meeting in Virginia Beach, VA in March, NC AWWA-WEA Chair Chris Belk gave an outstanding presentation on leadership. Several other members of the NC AWWA-WEA Board of Trustees and staff were also able to attend and benefitted from exchanging ideas with other member associations.

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SHIELD ENGINEERING, INC. provides a broad range of comprehensive environmental and engineering services. With our environmental, geotechnical engineering, and spill management groups Shield is uniquely qualified to address a variety of complex environmental issues, civil engineering challenges, and geotechnical and construction materials testing concerns.

Shield’s client-focused services provide economically feasible and environmentally sound solutions to the challenges of our industrial, commercial, and governmental clients. Shield establishes a partnership with the client through our client advocate program to guarantee an appropriate level of communication throughout the life of the project.

ENVIRONMENTAL SERVICES
Shield Engineering’s Environmental Group has an experienced staff of technical professionals, well-qualified in evaluating and managing our clients’ environmental liabilities. Our innovative technical approaches paired with regulatory expertise ultimately result in cost-effective and timely solutions to our clients’ challenges. Shield offers the following broad service areas encompassing our environmental work:

• Environmental due diligence
• Environmental engineering services

GEOTECHNICAL AND CONSTRUCTION SERVICES
The Geotechnical and Construction Services group of Shield Engineering has a number of experienced staff and licensed engineers to suit our clients’ needs. Whether it’s providing Construction Quality Assurance/Construction Quality Control (CQA/CQC) for a new project, design of a new structure, or diving into an investigation of why an existing structure is failing, Shield’s professionals have the know-how to ensure our clients will get a quality product, in a timely fashion.

• Construction services and testing services
• Geotechnical engineering
• Forensics and failure investigation

RECENT WORK
Shield Engineering has over 25 years of experience in engineering, environmental consulting, and remediation services. With broad experience in all aspects of geotechnical, environmental and civil engineering, Shield offers a wide range of technical expertise and technically appropriate solutions to problems.

PROJECTS
Sound Study for Proposed Firing Range Sites
Shield was retained by North Carolina Wildlife Resources Commission (NCWRC) to perform a sound study to collect sound data in the area of multiple proposed firing range sites in order to understand the levels of sound emanating from each of the proposed sites.

Stormwater Pond Rehabilitation
Shield was contracted to evaluate cost-effective design options to repair and rehabilitate 10 existing stormwater ponds.

Real Estate Development Inspections/Compliance Audits
Shield’s engineering services for land development and construction provides clients access to registered engineers, geologists, and scientists.

Subdivision in South Carolina
The project included designing a 16-foot tall retaining wall along the rear of the lot to create yard space behind the house under construction.

Residential Bunker Design
Shield’s multi-disciplined team allowed for the client to contract with one firm to provide the various aspects and needs of the project to produce the desired bunker.

Wateree Hydro Transformer Oil Containment System
Shield’s multi-disciplined Geotechnical department provided the client with a variety of construction quality assurance inspection and testing services. In doing so, the client was spared the burden of hiring multiple consultants and was provided a start-to-finish service.

Abandoned Landfill, Pre-Regulatory
Landfill Site, Spindale, North Carolina
Environmental Strategy, Environmental Sampling, Working with Inactive Hazardous Sites Branch (IHSB) of the North Carolina DENR.

“Shield Engineering has consistently provided outstanding construction documentation, contractor oversight and management, and excellent record keeping as a standard for all our environmental and stormwater projects.”

– Senior Environmental Engineer, Design & Construction Department, Norfolk Southern Corporation

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ClearWater, Inc. is only in its sixth year as a company, however, the average experience level of the 33 employees is over 15 years in the water and wastewater industry. The staff includes 14 inside sales, aftermarket parts, application engineering, and administrative personnel. Thirteen outside salespersons cover the municipal and industrial markets in the three-state area of NC/SC/VA. In addition, a service department consisting of five service persons and a service manager provide start-up service and maintenance for pumps, field instruments and process equipment. An affiliated local motor and pump repair shop provides quick, professional repair service for motors, pumps and some process equipment.

ClearWater represents 60 lines of equipment, pumps and services. It is our goal to provide quality products to our valued customers at reasonable prices and offer service and follow up in a professional and timely manner. The company has shown steady and continuous growth since inception by adding both product lines and experienced employees each year. With pumps and equipment installed in every major municipality and hundreds of industrial sites in the three-state area, ClearWater is constantly striving to provide continued professional service to existing customers and win the trust and respect of new customers every day. These efforts to provide quality products and service allow our staff to develop long-lasting relationships with many of those who are charged with the task of keeping the water resources of the states clean and useable for future generations.

ClearWater is well positioned for continued growth and stability into the future, as we are required to compete in a changing, dynamic market that is impacted by economic factors and environmental regulations on a continuous basis.
LaBella Associates

Formed in 1978, LaBella Associates drives successful results by building strong relationships with clients. We provide services that take a project from start to finish—from an initial study to determine a project’s feasibility to construction administration and start up, and everything in between. As one of North Carolina’s foremost engineers of stormwater systems and water and wastewater facilities, our experience in working with municipalities and counties is extensive.

In 2010, we merged with Pease Engineering and Architecture, one of North Carolina’s most established firms, with more than 75 years of experience. Together, we have an unsurpassed record of performance, stability and diversity. We are well respected for the quality of our design and construction documents and our ability to work with a wide range of building users. We continually seek better and more cost-effective ways to meet budget requirements, delivering innovation and maximum value.

During LaBella’s 37-year history, the firm has shown its capacity to reach for excellent, imaginative solutions to some of the community’s most demanding architectural, engineering, and environmental challenges, and has won respect for its skill in managing complex major projects with multiple stakeholders, including government agencies, school districts, the private sector, and citizens.

GEL Engineering of NC Inc.

A member of The GEL Group, Inc., GEL Engineering has been providing various subsurface utility engineering (SUE), surveying and geophysical services for over two decades. With support from our offices in Charleston and Beaufort, South Carolina and Marietta, Georgia, and a staff of over 20 full-time employees, we offer services in support of environmental and engineering projects. With innovative technology and staff of expert engineers and geophysicists, GEL Engineering provides state-of-the-art professional services to clients throughout the United States. GEL Engineering has aided airports, municipalities, universities, industrial clients, and federal facilities in mapping their underground infrastructure.

To see if we can assist with your next project, please contact Brandon Phillips or Dale McGowan at (919) 544-1100 or go to www.gelgeophysics.com.

Summary Of Services:
Subsurface Utilities:
• SUE Quality Levels D-A
• Computer Assisted Radar Tomography (CART) – 3D Subsurface Imaging
• Conventional Utility Designating / Locating
• Vacuum Excavation (Test Holes)

Surveying Services:
• ALTA / ACSM Surveys
• Utility As-Built Surveys
• Boundary Surveys
• Topographic Surveys
• GIS Mapping
• Route Surveys
• Static RTK / GPS Surveys
• Photogrammetric Ground Control
• Property Survey Condemnation Maps
• Full Suite of Surveying Services

Geophysical Services:
• Borehole Logging, Fracture Mapping Stratigraphy, Flow Logging
• Site Assessment – Contaminant Plumes, Drums, Tanks, Debris
• Geological – Stratigraphy, Mining, Voids, Karst, Bedrock
• Archaeological – Graves, Foundations, Artifacts
• Non-Destructive Evaluation – Concrete / Rebar Mapping, Void Detection
• Unexploded Ordnance Detection – Digital Geophysical Mapping

NC Office Locations:
• Raleigh
• Fayetteville
• Charlotte
If the challenge involves water, we’re up for it. We offer you a world of expertise, with value for today and foresight for tomorrow, for all of your unique water challenges. We’re building a world of difference. Together.

Charlotte  704-548-8461
Raleigh  919-462-0250
WeKnowWater@BV.com

A specialist in large diameter pipeline and pump station design, David McPherson, PhD, PE, has joined HDR’s Water Business Group in Charlotte, N.C. David, internationally recognized as a specialist in the design of hydraulic transient control systems and appurtenances, was most recently project manager/principal engineer for the design of 15 miles of 108-inch diameter pipeline for the Tarrant Regional Water District/Dallas Water Utility Integrated Pipeline Project in Texas.

“We are excited to welcome David to HDR and the Carolinas,” said Glen Ellmers, HDR’s Water Business Group East Region Director. “His experience leading large, complex water infrastructure projects broadens our capabilities in the Carolinas.”

“I think there will be a lot of opportunities for me to explore in the Carolinas,” David said, adding “It’s an exciting move for me.”

David is active in both the American Society for Civil Engineers (ASCE) and the American Water Works Association (AWWA). He was the technical chair of 2014 ASCE International Pipeline Conference in Portland, Oregon, and is vice chair of the ASCE committee for Hydraulic Transient Analysis and Control. He presently serves on the AWWA Air Valve (AWWA M51, C512), Stainless Steel (AWWA M11, C220), and PE Pipeline (AWWA M55, C906,) advisory committees.

McPherson joins HDR in Charlotte
## 2015 Schedule of Events

The following schedule is current as of May 2015. For updates or more information, please contact the organization listed with each event. If a listed event does not reference a specific organization, the item listed is a NC AWWA-WEA event. For further details concerning all NC AWWA-WEA events, visit the NC AWWA-WEA website at [www.ncsafewater.org](http://www.ncsafewater.org) or contact the NC AWWA-WEA office directly at (919) 784-9030.

**July**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>13-14</td>
<td>Academy Classes</td>
<td>Morganton, NC</td>
</tr>
<tr>
<td>13-17</td>
<td>Western Collection &amp; Distribution School</td>
<td>Morganton, NC</td>
</tr>
<tr>
<td>16</td>
<td>Growing Relationships &amp; Opportunities through Water Resources (GROW)</td>
<td>Asheville, NC</td>
</tr>
<tr>
<td>16-17</td>
<td>Board Meeting</td>
<td>Greensboro, NC</td>
</tr>
<tr>
<td>22</td>
<td>RCAP EPA Grant Training</td>
<td>Greensboro, NC</td>
</tr>
<tr>
<td>30</td>
<td>NC AWWA-WEA Drinking Water Rules &amp; Regulations Seminar</td>
<td>Raleigh, NC</td>
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**August**

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<tr>
<td>3-5</td>
<td>Advanced Utility Management Institute</td>
<td>Greensboro, NC, Chuck Christiansen (801) 281-0107</td>
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<tr>
<td>20</td>
<td>RCAP Regional Training</td>
<td>Washington, NC</td>
</tr>
<tr>
<td>24-28</td>
<td>Eastern Biological Wastewater School (Rescheduled from February)</td>
<td>Raleigh, NC</td>
</tr>
<tr>
<td>25-28</td>
<td>Physical/Chemical Wastewater Operators School (Rescheduled from February)</td>
<td>Raleigh, NC</td>
</tr>
<tr>
<td>27</td>
<td>NCWTFOCB Exams (application deadline 30 days prior)</td>
<td>Kinston, Morganton, and Raleigh NCWTFOCB (919) 707-9040</td>
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**September**

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<tr>
<td>10</td>
<td>Risk Management/Automation Seminar (Tentative)</td>
<td>Date to be announced</td>
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<tr>
<td>14-15</td>
<td>Academy Classes</td>
<td>Durham, NC</td>
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<tr>
<td>14-18</td>
<td>Eastern Collection &amp; Distribution School</td>
<td>Durham, NC</td>
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<tr>
<td>17</td>
<td>RCAP Regional Training</td>
<td>Asheville area</td>
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<td>21-24</td>
<td>Customer Service</td>
<td>Lillington, NC</td>
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<tr>
<td>24</td>
<td>Growing Relationships &amp; Opportunities through Water Resources (GROW)</td>
<td>Charlotte, NC</td>
</tr>
<tr>
<td>26-30</td>
<td>WEFTEC</td>
<td>Chicago, IL, WEF, (800) 666-0206, <a href="http://www.wef.org">www.wef.org</a></td>
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**October**

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<tbody>
<tr>
<td>29</td>
<td>NCWTFOCB Exams (application deadline 30 days prior)</td>
<td>Kinston, Morganton, and Raleigh NCWTFOCB (919) 707-9040</td>
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**November**

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<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>15-18</td>
<td>NC AWWA-WEA Annual Conference</td>
<td>Raleigh, NC</td>
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**December**

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>10</td>
<td>NCWPCSOCC Exams</td>
<td>Kenansville, Morganton, Raleigh, Salisbury, &amp; Williamston NCWPCSOCC (919) 807-6535</td>
</tr>
</tbody>
</table>
The Academy for Water Professional Development is a new initiative of NC AWWA-WEA to fill an industry training gap and advance the careers of participants. The program includes multi-year technical and leadership development training courses, which have been developed based on input from industry leaders across North Carolina.

Frequently Asked Questions

What is The Academy for Water Professional Development (The Academy)?
The Academy is a specialized training and certification program for current or prospective water industry employees seeking to advance their careers.

Why should I enroll?
The Academy has been built for professionals who look at the water industry not just as a job, but as a career. NC AWWA-WEA consulted with industry leaders to determine the most highly desired skillsets for upper level employees. Our courses have been designed to incorporate that feedback and position participants for supervisory and upper level management positions. Any individual who is serious about advancing his or her career and is willing to invest time into training is encouraged to enroll.

How is The Academy structured?
The courses for each discipline in our program have been organized into four certification levels: Apprentice, Journeyman 1, Journeyman 2, and Master. Certification will require completion of all courses within each level (or equivalent) and passing a comprehensive exam.

Can I receive credit for prior training or years in the workforce?
Credit for previous training courses and/or work experience will be determined on a case-by-case basis. Participants will be given an opportunity to submit these items for review upon registration.

Is this training required by the State?
No. Most training will result in voluntary certification.

Will I receive a degree or college credit?
The Academy is not currently affiliated with any college or outside degree program. All certifications will be from NC AWWA-WEA only.

Where will the training be held?
Training sessions will be held at venues throughout North Carolina and online.

What disciplines are currently available for certification?
We are currently offering courses in Collection System Technician and Distribution System Technician programs; however, more disciplines are currently under development.

How long will it take me to complete each level of a discipline?
The timeframe for completing each level will vary depending on the number of hours the participant can devote to the training.

Will CEUs be required to maintain certification?
Yes. To maintain the value and credibility of the certificates, continuing education will be necessary.

How can I become an instructor or volunteer to help with The Academy?
Volunteer opportunities with The Academy are numerous and include behind the scenes administrative work, course and curriculum development, marketing, and instruction. Individuals who are interested in volunteering or becoming an instructor should contact Catrice Jones at CJones@ncsafewater.org.

Kickoff Classes for The Academy for Water Professional Development
We are releasing the first phase of courses on July 13-14 in Morganton, NC during the Collection/Distribution School.

Registration for the courses listed below will open with registration for the July Collection & Distribution School. Course descriptions are available on The Academy web page.

Monday, July 13, 2015
6 hour continuing education credit
⇒ Basic Utility Safety and Field Operations Safety Awareness
⇒ Foundations of Leadership: Customer Service

Tuesday, July 14, 2015
6 hour continuing education credit
⇒ Support Systems Awareness for Collections
⇒ Distributions Operations and Foundations of Leadership: Effective Self-Management
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<tr>
<td>ACIPCO</td>
<td>43</td>
<td>205-325-7701</td>
<td><a href="http://www.american-usa.com">www.american-usa.com</a></td>
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<tr>
<td>Alliance Consulting Engineers</td>
<td>89</td>
<td>704-527-4474</td>
<td><a href="http://www.allianceCE.com">www.allianceCE.com</a></td>
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<td>Analytical Services, Inc.</td>
<td>70</td>
<td>770-734-4200</td>
<td><a href="http://www.asi-lab.com">www.asi-lab.com</a></td>
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<td>ASA Analytics</td>
<td>54</td>
<td>704-583-2305</td>
<td><a href="http://www.asaanalytics.com">www.asaanalytics.com</a></td>
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<td>Bio Green Services, Inc.</td>
<td>38</td>
<td>336-940-4544</td>
<td><a href="http://www.biogreensvc.com">www.biogreensvc.com</a></td>
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<td>Bio Triad Environmental, Inc.</td>
<td>21</td>
<td>888-658-7423</td>
<td><a href="http://www.BIOTRIAD.com">www.BIOTRIAD.com</a></td>
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<tr>
<td>Bilfinger Water Technologies-Airvac</td>
<td>9</td>
<td>813-855-6297</td>
<td><a href="http://www.water.bilfinger.com">www.water.bilfinger.com</a></td>
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<tr>
<td>Black &amp; Veatch</td>
<td>89</td>
<td>407-548-8561</td>
<td><a href="http://www.bv.com">www.bv.com</a></td>
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<td>Carolina Management Team</td>
<td>15</td>
<td>828-648-7708</td>
<td><a href="http://www.CMTcoatings.com">www.CMTcoatings.com</a></td>
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<td>Carolina Pumpworks, LLC</td>
<td>79</td>
<td>843-522-9600</td>
<td><a href="http://www.cpwl.com">www.cpwl.com</a></td>
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<td>CBI Constructors, Inc.</td>
<td>93</td>
<td>800-543-2938</td>
<td><a href="http://www.cbi.com">www.cbi.com</a></td>
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<td>CDM Smith</td>
<td>26</td>
<td>919-787-5620</td>
<td><a href="http://www.cdmsmith.com">www.cdmsmith.com</a></td>
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<td>CH2M Hill</td>
<td>6</td>
<td>704-544-4040 or 919-875-4311</td>
<td><a href="http://www.ch2m.com">www.ch2m.com</a></td>
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<td>Charles R. Underwood, Inc.</td>
<td>81</td>
<td>800-729-2463</td>
<td><a href="http://www.crumpumps.com">www.crumpumps.com</a></td>
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<td>ClearWater, Inc.</td>
<td>48, 49, 87</td>
<td>828-855-3182</td>
<td><a href="http://www.clearwaterinc.net">www.clearwaterinc.net</a></td>
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<td>Covalen</td>
<td>60</td>
<td>877-770-8277</td>
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<td>Crom Corp</td>
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<td>352-372-3436</td>
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<td>Crumpler Plastic Pipe, Inc.</td>
<td>74</td>
<td>800-334-5071</td>
<td><a href="http://www.ccpp-pipe.com">www.ccpp-pipe.com</a></td>
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<td>Dixie Electro Mechanical Services Inc.</td>
<td>52</td>
<td>704-332-1116</td>
<td><a href="http://www.dixee.mi.com">www.dixee.mi.com</a></td>
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<td>EMA Resources, Inc.</td>
<td>71</td>
<td>336-751-1441</td>
<td><a href="http://www.emaresourcesinc.com">www.emaresourcesinc.com</a></td>
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<tr>
<td>Engineered Pumps Inc.</td>
<td>18, 19</td>
<td>800-528-4154</td>
<td><a href="http://www.engineered-pump.com">www.engineered-pump.com</a></td>
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<tr>
<td>Ferguson Waterworks</td>
<td>24</td>
<td>803-457-5718</td>
<td><a href="http://www.ferguson-pumpwaterworks.com">www.ferguson-pumpwaterworks.com</a></td>
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<td>Flygt - a Xylem brand</td>
<td>22</td>
<td>704-504-8804</td>
<td><a href="http://www.xylemic.com">www.xylemic.com</a></td>
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<td><a href="http://www.forceflow.com">www.forceflow.com</a></td>
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<td>Franklin Miller</td>
<td>69</td>
<td>800-932-0599</td>
<td><a href="http://www.franklinmiller.com">www.franklinmiller.com</a></td>
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<td>Freese and Nichols</td>
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<td>919-582-5850</td>
<td><a href="http://www.freese.com">www.freese.com</a></td>
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<td>Garney Construction</td>
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<td>407-877-5903</td>
<td><a href="http://www.garney.com">www.garney.com</a></td>
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<td>GEL Engineering of NC, Inc.</td>
<td>88</td>
<td>919-544-1100</td>
<td><a href="http://www.geology.com">www.geology.com</a></td>
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<td>Hazen &amp; Sawyer, P.C.</td>
<td>4</td>
<td>919-833-7152</td>
<td><a href="http://www.hazenandsawyer.com">www.hazenandsawyer.com</a></td>
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<td>704-338-6700</td>
<td><a href="http://www.hdrinc.com">www.hdrinc.com</a></td>
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<td>Heyward Incorporated</td>
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<td>952-829-0731</td>
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<td>800-879-6353</td>
<td><a href="http://www.kemira.com">www.kemira.com</a></td>
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<td>Kimley-Horn and Associates, Inc.</td>
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<td>888-542-4636</td>
<td><a href="http://www.kimley-horn.com">www.kimley-horn.com</a></td>
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<td>Kusters Water</td>
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<td>800-264-7005</td>
<td><a href="http://www.kusterswater.com">www.kusterswater.com</a></td>
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<td>LaBella Associates, P.C.</td>
<td>38, 88</td>
<td>585-454-6110</td>
<td><a href="http://www.labellacp.com">www.labellacp.com</a></td>
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<td>Lord &amp; Company, Inc.</td>
<td>45</td>
<td>803-802-0060</td>
<td><a href="http://www.lordandcompany.com">www.lordandcompany.com</a></td>
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<td>Martech Research</td>
<td>93</td>
<td>803-459-2427</td>
<td><a href="http://www.martechresearch.com">www.martechresearch.com</a></td>
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<td>McGill Associates</td>
<td>70</td>
<td>828-252-0575</td>
<td><a href="http://www.mcgillengineers.com">www.mcgillengineers.com</a></td>
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<td>McKim &amp; Creed</td>
<td>57</td>
<td>704-841-2588</td>
<td><a href="http://www.mckimcreed.com">www.mckimcreed.com</a></td>
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<tr>
<td>Medora Corporation (SolarBee and GridBee brands)</td>
<td>2</td>
<td>866-437-8076</td>
<td><a href="http://www.medoraco.com">www.medoraco.com</a></td>
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<td>Neptune</td>
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<td>281-794-3133</td>
<td><a href="http://www.neptunetg.com">www.neptunetg.com</a></td>
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<td><a href="http://www.oldcastleprecast.com/wastewater">www.oldcastleprecast.com/wastewater</a></td>
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<td>541-689-5851</td>
<td><a href="http://www.oti.cc">www.oti.cc</a></td>
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<td>919-661-9488</td>
<td><a href="http://www.pccconstruction.com">www.pccconstruction.com</a></td>
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<td>Pete Duty &amp; Associates</td>
<td>75</td>
<td>704-573-2035</td>
<td><a href="http://www.peteduty.com">www.peteduty.com</a></td>
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<td>Pittsburg Tank &amp; Tower</td>
<td>14</td>
<td>270-826-9000 x330</td>
<td><a href="http://www.watertank.com">www.watertank.com</a></td>
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<td>Pollardwater.com</td>
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<td>800-437-1146</td>
<td><a href="http://www.pollardwater.com">www.pollardwater.com</a></td>
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<td>Precon Tanks</td>
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<td>352-332-1200</td>
<td><a href="http://www.precontanks.com">www.precontanks.com</a></td>
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<td>888-PRELOAD</td>
<td><a href="http://www.preload.com">www.preload.com</a></td>
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<td>704-907-5474</td>
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<td>RK&amp;K</td>
<td>89</td>
<td>888-521-4455</td>
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<td>SaniTaite - a Xylem brand</td>
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<td>414-365-2200</td>
<td><a href="http://www.xylemic.com">www.xylemic.com</a></td>
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<td>Schnabel Engineering</td>
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<td>336-274-9456</td>
<td><a href="http://www.schnabel-eng.com">www.schnabel-eng.com</a></td>
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<td>Shield Engineering, Inc.</td>
<td>86</td>
<td>800-395-5220</td>
<td><a href="http://www.shielsengineering.com">www.shielsengineering.com</a></td>
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<td>ShinMaywa (America), Ltd.</td>
<td>38</td>
<td>704-945-7112</td>
<td><a href="http://www.shinmaywa.co.jp/america/">www.shinmaywa.co.jp/america/</a></td>
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<td>Smith &amp; Loveless Inc.</td>
<td>17</td>
<td>800-898-9122</td>
<td><a href="http://www.smithandloveless.com">www.smithandloveless.com</a></td>
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<td>336-865-0260</td>
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<td>Utility Land Service, LLC</td>
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<td>www'utilitylandservice.com</td>
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<td>678-730-0997</td>
<td><a href="http://www.wcequipment.com">www.wcequipment.com</a></td>
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<td>WSG &amp; Solutions, Inc.</td>
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<td><a href="http://www.wsgandsolutions.com">www.wsgandsolutions.com</a></td>
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NC Currents Future Themes & Submission Deadlines

NC Currents is the official publication of NC AWWA-WEA. Members, individuals, and committees are encouraged to submit content for the magazine. If you would like to submit an article to be considered for publication in NC Currents please complete the Submission Form & Publication Agreement (available at www.ncsafewater.org) and email both the completed form and your article to Nicole Banks at nbanks@ncsafewater.org. Articles must be received by 5:00pm EST on the listed submission deadline.

The editors of NC Currents welcome the submission of all articles related to the water and wastewater industry. Themes serve as general guidance for each issue, but articles are not limited to an issue’s specific theme. Submission of an article does not guarantee publication. The editorial committee will review and select all articles, and authors will be notified of the status of their submission.

**FALL 2015**
**Trenchless Technology: Not a Boring Subject** (Submission Deadline July 6, 2015)

When the conventional method of trenched pipe installation or rehabilitation fails or is just not feasible, trenchless construction can sometimes provide the solution. Whether it is dry bore, pipe jacking, horizontal directional drilling, directional bore, micro-tunneling, tunneling, moling, slip ling, pipe bursting, and other such methods of trenchless installation, this technology is developing and solving tough installation problems with ground breaking advances. In this issue of NC Currents, trenchless technology will feature projects, methodologies, and the application of trenchless installations and innovations.

**WINTER 2016**
**How We Protect Your Water** (Submission Deadline October 5, 2015)

According to mywatermatters.org “…the value of water is immeasurable. It is a vital resource in every form of nourishment we need for our bodies to survive and in every commodity we use…” Every person living in North Carolina benefits from clean safe water every day. However, the general public may not be aware of the resources, technology, and professionals who protect their water, treat it to drinking water standards, deliver it to homes and businesses, collect it after use, and treat it prior to returning it to the environment. This issue of NC Currents will explore the many ways that water industry professionals protect the general public. Potential topics include:

- Protection of source waters,
- Water forecasting, management, and regional master planning,
- Advances in treatment technology,
- Best practices in storage, distribution, pumping, and collection,
- Improvements in water quality through monitoring

To reach North Carolina’s water industry professionals through the NC Currents magazine and its targeted readership, contact Al at your earliest convenience to discuss your company’s promotional plans for 2015.

**Al Whalen**, Marketing Manager
1-866-985-9782
awhalen@kelman.ca
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Aqua-Aerobic Systems, Inc. (†)
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Aquionics, A Halma Company
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ASA Analytics
Chem Scan®

Ashbrook Simon-Hartley, An Alfa Laval Company
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Blue -White Industries, Inc.
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Blue InGreen®, LLC
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Cerlic Environmental Controls, Inc.
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Enviromix, Inc.
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Evoqua Water Technologies LLC
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Fluid Engineering
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