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Is your water safe to drink? While this question seems easy to answer, national events have caused a level of skepticism that I haven’t seen in a very long time. The “safe water” question is at the heart and core of our industry and is consuming the conversation nationally and locally. Safe water is more than a buzzword or cliché. Safe water is our core competency; it is our product that is provided by a cast of industry professionals.

Nationally, this safe water question has permeated our news and conversation over the past few years. Most recently, in Charleston, West Virginia, the Elk River chemical spill affected nine counties and left up to 300,000 people without potable drinking water. Of those, 122 sought medical treatment. Toledo, Ohio was in the headlines for microcystis algae blooms that threatened the water supply of nearly 500,000 citizens. Even though phosphorus from farm fertilizer was the main culprit, it was water professionals who were tasked with providing safe drinking water. Flint, Michigan was found to be in violation of the Safe Drinking Water Act due to total trihalomethanes (TTHMs), along with high lead levels and ineffective corrosion control procedures. This prompted a state of emergency issued by the president of the United States. Locally, it is estimated that up to 39,000 tons of coal ash spilled into the Dan River in Eden, North Carolina, about 80 miles upstream from the Kerr Reservoir.

Because of these water quality events, especially the Flint, Michigan crisis, many utilities are re-evaluating their treatment processes, conveyance systems, and customer relationships. Utility owners face mounting regulatory requirements to ensure the delivery of safe drinking water. Utility owners must continue to be more efficient and implement “big data” systems that provide the transparency demanded by the public.

According to the Environmental Protection Agency (EPA), states and other stakeholders are to identify strategies and actions to improve the safety and sustainability of our drinking water systems, including:

- ensuring adequate and sustained investment in, and attention to, regulatory oversight at all levels of government;
- using information technology to enhance transparency and accountability with regard to reporting and public availability of drinking water compliance data;
- leveraging additional funding sources to finance maintenance, upgrading, and replacement of aging infrastructure, especially for poor and overburdened communities; and
- identifying technology and infrastructure to address both existing and emerging contaminants.

The above challenges require all sectors of the water/wastewater industry to be dedicated to providing creative solutions that are cost effective and easy to implement, and that furnish transparency and proper data analytics to serve our North Carolina communities.

While the water utility industry is facing many challenges, it takes trained water industry professionals to meet them. Utility professionals, at all levels, must be well trained and educated on emerging trends, new processes, new equipment, and technologies. Hence, NC AWWA-WEA is dedicated to providing water and wastewater education, training, and service in an effort to protect public health and the environment. Our core purpose is to enrich the expertise of water professionals in North Carolina. In answering the safe water question, now is the time of enrichment. We challenge you to lend your expertise to our association to ensure that we maintain our status as the leading resource.

Is your water safe to drink? My water is safe to drink. I am a proud ‘WIP’ (Water Industry Professional). While many North Carolinians may take for granted the contributions of the members of NC AWWA-WEA, let us stand up, be proud, and continue to permeate safe water throughout our communities. Carry the water/wastewater (all water) badge of honor wherever you go. We are the water industry professionals of NC AWWA-WEA.
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“I am both humbled and proud to be a part of such a spectacular group of professionals. YOU are the reason we strive to improve and only with your help can we navigate the course ahead.”

Now that we have completed another successful Annual Conference, I turn my attention to the holiday season and the closing of another year. As I sit and ponder, I begin to focus on all the things that I have learned during my first year as Executive Director of NC AWWA-WEA and all the things that this organization has accomplished. Although I have been with NC AWWA-WEA in various roles for many years, my new role allows me to see things from a different perspective and NEVER have I been so aware of how much this organization does and how many people it takes to keep the train on the tracks. I must admit I am in awe of the contributions of individuals and companies that allow NC AWWA-WEA to be successful. I want to take this opportunity to thank just a few key people and groups.

To our leaders – Board of Trustees, Council Chairs, and Committee Chairs/Vice Chairs... THANK YOU for your dedication, leadership and vision. Your willingness to sacrifice time away from your jobs, families, and your own personal pursuits is a vital part of our success. The amount of time that you dedicate to NC AWWA-WEA is truly astonishing.

To our Sponsors and Donors... THANK YOU for financial support that you provide to our organization. Your contributions allow us to deliver programs that not only further our Mission and Vision, but also help generations of industry professionals to come.

To the Staff... THANK YOU for your patience and devotion to each other and our members. The hard work you put in on a daily basis does not go unnoticed by me, the Board, or our members. All that you do is truly appreciated!

To My Mentors and Friends... This group is too large to name but you know who you are. THANK YOU for your continued patience and guidance on my journey. You have provided a listening ear, a shoulder to cry on, and words of encouragement when needed. You never fail to tell me what I “need” to hear, and not what I “want” to hear, to ensure that I continue to grow professionally and personally.

To You – Our Members, Volunteers and Customers THANK YOU for your continued support of our organization and its programs. Whether you have attended an event, participated as a presenter, volunteered to coordinate an event, or performed another task, your contributions are what allow us to be of service to the industry. Your feedback allows us to see the areas in which we can improve as we chart the course before us.

I am both humbled and proud to be a part of such a spectacular group of professionals. YOU are the reason we strive to improve and only with your help can we navigate the course ahead.

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<tbody>
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Annal Conference Coordinating Council

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<th>Committee</th>
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<tbody>
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External Affairs Council

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<tbody>
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Utility Management Committee

When a leak is reported by a customer to a call center, customer service typically sends someone out to investigate, often resulting in a work order to field operations. Depending on the nature of the leak, the issue could require further intervention from distribution and plants. “There are a lot of linkages there,” notes Westin Engineering’s Chip Harris, currently the vice chair of the Utility Management Committee. “From a business process standpoint, to make those linkages from the plant all the way through to customer service requires a cross-functional focus across the utility operation.”

The NC AWWA-WEA board of trustees recently reconfigured the former Finance and Management Committee to encompass this wider focus, rebranding the group as the Utility Management Committee. “Before, the group tended to focus more on the customer-facing side of the utility,” acknowledges Harris. “Our aim is to fortify the operational and management linkages so we can remain connected with finance and customer service while expanding the focus to also include field operations/distribution and treatment.” In the example of a reported leak above, there are touchpoints for critical utility management priorities related to Asset Management, Aging Infrastructure, and Capital Projects Funding – all of which ultimately affect customers. Making those linkages, he adds, is both a goal and a challenge.

Knowing that LaBella’s Brian Houston would be up to the challenge, NC AWWA-WEA asked him if he would chair the new Utility Management Committee. The former Florida Water Environment Association president-elect accepted and then, realizing that former members of the discontinued Finance Committee were likely to be interested in participating, he reached out to a number of them. A few, including Harris, came on board. In turn they recruited others from all across the state.

From four members in attendance at the inaugural February 2016 meeting, the committee has grown to a roster of 16, representing a wide distribution. “We have broad representation of the industry,” acknowledges Houston, noting that along with consultants and utility managers, the committee includes a number of people from government agencies as well as a representative from the University of North Carolina School of Government.

Meeting monthly by teleconference – with one in-person meeting in Cary last August – the committee spent most of 2016 focused on determining how to best meet the needs of the board and the membership. To identify topics that will be important for the committee to address, Houston started by approaching NC AWWA-WEA members Julie Hellmann, Leila Goodwin, and Jackie Jarrell. They highlighted areas such as procurement, finance, workforce issues, and funding.
“They pointed out that none of these topics were currently being addressed,” says Houston. “In a way, we’re the catchall for issues that are non-technical in nature, all the things that the director of utilities worries about.”

The Utility Management Committee also created a survey that NC AWWA-WEA sent out to all utility members in order to find out what they wanted the committee to do for them. “I see our activity as being a service to the utility employee membership of NC AWWA-WEA,” says Houston. “I want to make sure that what we are doing is providing value to those members.” The survey asked utility members “what do you want from us, and what are the highest priorities of things we can do for you?”

One of the recurring themes that surfaced from the survey, as well as from Houston’s conversation with Hellman, Goodwin, and Jarrell, were workforce-related issues. In response, the committee organized The Aging Workforce Panel to be held in the first half of 2017. Panelists will encompass a range of people who face these particular issues. Says Houston, “We will allow participants to ask the panelists questions and have some questions prepared for them as well. The hope is that the event will provide a lot of value in terms of understanding some of the best practices, as well as an opportunity to share ideas with other people who are facing similar issues.”

Workforce issues were only one of many topics distilled from the survey. In fact, the top priority was identified as asset management, followed closely by customer service. During a meeting at the NC AWWA-WEA Annual Conference in November, the committee started making plans around these topics. At the same time, the Utility Management Committee focused on developing curriculum for the customer service topics of the Academy and supporting the Institutes. “We know this is a priority for NC AWWA-WEA,” says Houston. “We are looking forward to having the opportunity to help out.”

Harris adds that the committee hopes to meet the needs of all types of systems. “We are trying to cultivate participation from some of the smaller utilities,” he explains. “The larger utilities tend to have greater interest, but the committee is working to make connections with smaller utilities to understand common needs.” He points out that issues such as succession planning and knowledge retention affect both large and small utilities alike.

“As we expand our membership we will try to host more regional events,” says Harris, underlining the importance of reaching into the far western and eastern reaches of the state. “Travel dollars are always a consideration for utilities.”

“Our goal is to provide benefit to utility managers in any way we can,” adds Houston. “I hope a year or so down the road a lot of utilities around the state will feel that’s exactly what we’re doing.”

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How timely it is for Angela Lee to become chair of the board of trustees just when NC AWWA-WEA is forging ahead with two new bold educational initiatives. A passionate advocate for the Academy and the Institute programs, the chief of operations for Charlotte Water has devoted most of her energy and time as a volunteer to education and training. She spent many years on the Board of Education and Examiners, including a term as chair. She also served with the Collection and Distribution Schools Committee and three terms on the board of trustees. At the same time, she has been a member of the National Collection Systems Committee and the National Program Committee and currently sits on the WEF Collection Systems Symposia.

“I have been involved with education and training for many years,” Lee acknowledges. “So I understand the importance of delivering quality education. As a utility manager, I also understand the importance of receiving that education. I hope I can bring those perspectives to the organization.”

It is a perspective that Lee adopted early in her career. After graduating from North Carolina State University with a Bachelor of Science in Industrial Engineering, she spent two and a half years with the Charlotte Department of Transportation (Storm Water) before joining what was then known as the Charlotte Mecklenburg Utilities Department (now Charlotte Water) as Wastewater Administrative Officer in 1990. Immediately, she did two things. She continued working on her master’s degree in Public Administration at UNC Charlotte, and she joined the state’s premiere professional association for water and wastewater.

“The director set an expectation that staff would be involved in the NC AWWA-WEA,” explains Lee. “It was part of the culture of our organization and it still is.”

Two years later, when she assumed the position of Water Distribution Superintendent, the NC AWWA-WEA became an invaluable resource for both networking and professional development. “When I became the superintendent, I really saw the benefit in terms of education and training for both me and my staff,” says Lee. She went on to complete her Grade A Certified Water Distribution Operators License and become Operator Responsible in Charge for the water distribution system. It was also around this time that she...
became involved with the Collection and Distribution Schools, where she has served as the Grade A Coordinator since the mid-1990s. In recognition of her active role in NC AWWA-WEA, she has received several awards, including the AWWA's George Warren Fuller Award, WEF's Arthur Sidney Bedell Award, Raymond "Red" Ebert Award, and Golden Manhole. Lee is also a member of the 5-S Society.

Along with her graduate degree, which she completed in 1995, her experience with the NC AWWA-WEA has played an important role in the advancement of her career and her commitment to training. An important part of her drive for continuous improvement at Charlotte Water has been ensuring that staff is properly cross-trained to provide a variety of repair functions. She has also created full-time valve operations crews and developed water main break procedures to facilitate onsite water quality testing. Other initiatives have included developing asbestos cement pipe repair procedures and upgrading sewer equipment so that crews could be more efficient when cleaning and responding to calls for service.

In 2004, when CMUD combined the water distribution and wastewater collections divisions, Lee was named Field Operations Division Manager for the entire conveyance system, including 300 employees and over 8,000 miles of pipe. Her leadership was instrumental during this challenging period of transition.

It is experience that she is sure to put to good use as she takes on the leadership of the board of trustees at this critical juncture in the history of NC AWWA-WEA. Says Lee: “I am looking forward to leading the organization through this time of transition, and focusing on strategic initiatives such as the Academy and membership engagement. As the NC AWWA-WEA improves its training model and moves forward toward fully implementing the Academy and the Institutes, it is going to take volunteers and maybe even a different way of delivering training, using technology as well as resources that are both internal and external to the organization.” She adds that, along with growing the membership, it is also important to keep members engaged and active.

Professionally, her goals include continuing to increase her utility knowledge in order to help Charlotte Water reach its strategic goals. “Utilities across the country have the awesome charge of providing safe drinking water and of protecting the environment,” she notes. “I am very proud to work in an organization that is an industry leader in this field.”

In her leadership role at Charlotte Water and now with the NC AWWA-WEA, Lee is committed to doing her part to make a difference in the industry. “It’s a tremendous opportunity to be able to serve in this role,” she says, referring to her new position as the chair of the board of trustees. “I am honored by the faith the membership has placed in me.”

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Being the board of trustees’ liaison for the Conference Committee is a perfect fit for Chuck Shue. The senior project manager at McKim & Creed, Inc. has ample experience helping the NC AWWA-WEA prepare for the annual conference. “I was always involved with the local arrangement committee, in various tasks,” says Shue, who ramped up his participation with the NC AWWA-WEA when he joined the Program Committee. “It gives you a great sense of accomplishment. When the conference is over, you can look back and see all the pieces that fit together.”

After a few years as chair of the Program Committee, he accepted a position as chair of the Annual Conference Coordinating Council, becoming the point person for all committees related to both the annual and spring conferences. “That was an eye-opening experience in terms of what it really takes to put the conferences on,” says Shue. “I knew the volunteer side from the committee work but I didn’t realize everything the staff does to put these events together. There’s a lot to keep up with.” In the fall of 2015, he was asked to join the board of trustees and is currently serving his second mandate.

It was only 10 years ago that Shue became actively engaged in NC AWWA-WEA. At the time, his coworkers at McKim & Creed, including local management, became increasingly involved, and they encouraged him to follow suit. Before then, his involvement had been limited to attending the Annual Conference in order to earn professional development hours (PDHs). “That was an early reason for going,” he explains.

Along the way, he began to appreciate the networking opportunities. Over the years, NC AWWA-WEA members from a wide range of consulting firms and utilities have become not only valued colleagues, but also treasured friends. Shue notes that he always looks forward to reconnecting with them once a year at the conference.

“It’s great to learn how and what other people are doing,” he adds. The opportunity to share information and best practices is invaluable to his work in water and wastewater. As his 40-year career has been devoted mainly to consulting, his involvement in the NC AWWA-WEA as he is about his work. “I enjoy the interaction with the other members of NC AWWA-WEA,” he says. “It offers great value to an industry that is devoted to providing people with clean water.”

Outside of work, Shue enjoys spending time with his wife, his three children and his three grandchildren.
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Plant Spotlight:
City of Henderson: Kerr Lake Regional Water Treatment Plant

By Steve Gupton, Chief Operator
Edited by John Rutledge, Smart Cover Systems
(NC AWWA-WEA Plant Operations & Maintenance Committee)

General
The Kerr Lake Regional Water System (KLRWS) is located in the City of Henderson, NC, north of the Triangle on Kerr Lake and is accessible by I-85. The system provides water to approximately 50,000 customers. The City of Henderson is the main shareholder in a partnership of three, which also includes the City of Oxford and Warren County. Together, these providers supply water to Franklin County, the Village of Kittrell, the Town of Stovall, Vance County, and parts of Granville County. The Kerr Lake Regional Water Treatment Plant (WTP) is a 10-mgd facility with capacity for 15 mgd; daily average is around 7.0 mgd. The water source for the WTP is Kerr Lake.

WTP Background History
The concept of a regional water system came about around 1973 to 1975 when the Miller Brewing Company was interested in relocating to the City of Henderson. Because the Kerr Lake Regional WTP was not producing enough water, however, Miller Brewing Company decided to relocate to Eden, NC, resulting in a significant economic loss for the city and its surrounding communities. As a result, the City of Henderson, City of Oxford, and Warren County – with the collaboration of the city manager of Henderson (Melvon Holmes), the city manager of Oxford (H. T. Ragland), and the president of the Soul City Company (Floyd B. McKissick Sr.) – decided action needed to be taken in order to secure more water for their communities and attract other businesses to the region. They joined forces and set out to procure funding.

At the time, McKissick Sr. was developing Soul City, NC, which was one of the new cities across the country that were being funded by the federal government. These new communities were built in areas that had little resources to help them obtain water, roads, housing, and other basic human needs. McKissick Sr.’s first request for funding from the federal government was turned down, but he didn’t let that stop him. He went to Washington, DC, and convinced Nelson Rockefeller to get the funding he needed. After these efforts, it took several years to develop a plan, and L. E. Wooten of Raleigh was eventually hired as the consulting firm to help
construct the Kerr Lake Regional WTP. The WTP was completed in 1974 and is still owned today by the City of Henderson, the City of Oxford, and Warren County.

**Treatment**
The Kerr Lake Regional WTP is a conventional treatment system, consisting of coagulation, flocculation, sedimentation, and filtration. Aluminum sulfate is the primary coagulant with polymer used as an aid; liquid hypochlorite is used for disinfection. In 1996, the WTP performed filter rehabilitation on all four of its filters and conducted a capacity study. As a result, it was approved as the first WTP in the state to have the ability to use a high-rate filtration in order to increase its capacity from 10 mgd to 15 mgd, without the need for a physical upgrade.

**Solids Management**
The basins in the sedimentation process have a “spyder” system that draws alum sludge off the bottom of the basins and sends it to two thickeners and a square cement holding clarifier. Supernatant is then decanted back to the lake, with the solids being land applied and handled by Granville Farms.

**Operations**
The Kerr Lake Regional WTP can be operated almost completely by its SCADA system. Most pumps and valves can be controlled from the control center in the main building. With a mostly consistent raw water source and low raw-water turbidity, operational challenges are minimized. When fully staffed, there are 12 available operators, and any operational challenges are handled promptly, effectively, and efficiently.

### Table 1

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Operator</td>
<td>A: Upon-hire</td>
<td>Within two years</td>
<td>Within two years</td>
<td>N/A</td>
<td>Upon-hire</td>
<td>N/A</td>
</tr>
<tr>
<td>Operator</td>
<td>C: Within one year</td>
<td>Highly encouraged</td>
<td>Highly encouraged</td>
<td>N/A</td>
<td>Required after A-Certification</td>
<td>N/A</td>
</tr>
<tr>
<td>Maintenance</td>
<td>C: Within one year</td>
<td>N/A</td>
<td>N/A</td>
<td>New hires, as applicable</td>
<td>Required after A-Certification</td>
<td>N/A</td>
</tr>
<tr>
<td>Chemist</td>
<td>C: Within one year</td>
<td>Within two years</td>
<td>Within two years</td>
<td>N/A</td>
<td>Required after A-Certification</td>
<td>N/A</td>
</tr>
<tr>
<td>Administrative Secretary</td>
<td>C: As applicable</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Required within one year</td>
</tr>
</tbody>
</table>
Staff
When staffed to capacity, there are 13 fulltime employees that work at the Kerr Lake Regional WTP. There is one director/ORC and one chief operator/back-up ORC. There are seven operators, two maintenance personnel, one lab analyst, and one administrative secretary.

Staff Development
Table 1 on the previous page shows the certification requirements for all employees at the Kerr Lake Regional WTP. In addition, staff members are highly encouraged to go beyond requirements and attain the highest level of certification possible, where appropriate. Any available classes that employees wish to attend are always considered, taking into account schedules, time, and available funds. Cross-training is also highly encouraged.

In order to accommodate a WTP that needs to be operated for 24 hours a day and seven days a week, the Kerr Lake Regional WTP has two shifts per day. Each operator has a three-day work week, with two 14-hour days and one 12-hour day. The director, chief operator, chemist, maintenance staff, and administrative secretary all work eight hours, Monday through Friday.

Health and Safety
The KLRWS takes the health and safety concern of its employees very seriously. Working around bulk chemicals on a daily basis and smaller chemical amounts in the laboratory, the need for safety is obvious. Safety meetings are conducted along with regular meetings at least every six months. In the interim, safety lessons are assigned for training purposes and safety is practiced on a daily basis. Concurrent with the WTP safety training, there is a Risk Management Committee for the City of Henderson that frequently meets to discuss health and safety issues throughout the city departments. It also allows for health and safety training and awareness through the annual City of Henderson Employees’ Health and Safety Fair.

Awards
The Kerr Lake Regional Water System has received numerous awards and achievements, as listed below.

- NC AWWA-WEA Best-tasting Water
  - 1st place: 2000, 2001, 2002 (First and only WTP to win three times in a row)
  - 2nd place: 1989, 1994
- NC Rural Water Association Best-tasting Water
  - 1st place: 2013
  - 2nd place: 2014
  - 3rd place: 2011
- NC Rural Water Association Spirit Award 2003
- NC Rural Water Association – Certificate of Achievement Source Water Protection (First WTP in the state to complete)
- NC’s Area Wide Optimization Program

Future Plans
A major expansion of the Kerr Lake Regional WTP to double its capacity size from 10 mgd to 20 mgd is in the works for Fiscal Year 2018-2020.

Contact Information
Christy Lipscomb, Director/ORC
Email: clipscomb@ci.henderson.nc.us
Phone: 252-438-2141
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Superior mixing with adjustability and simplicity, for unsurpassed energy savings.
Three days of educational and recreational activities provided the perfect backdrop for exchanging ideas. Attendees gained a national perspective from guests Jaqueline Torbert, AWWA Vice-President, and Jackie Jarrell, WEF Board Trustee.

Papers presented during technical sessions on Monday and Tuesday gave attendees the opportunity to learn from others’ experiences. Technical sessions running all day with no formal lunch break allowed attendees to attend even more sessions and stop for a buffet lunch when they were ready. The pre-conference workshop “An Overview on the Background on Regulations and Programs Related to Lead in Drinking Water” focused on topics related to the crisis in Flint, Michigan. The Wednesday forum built on the Sunday pre-conference workshop with a discussion on lessons learned from the Flint, Michigan crisis. Monday’s Opening Session speaker, Greg Fishel, Chief Meteorologist from Capital Broadcasting shared his thoughts on climate change as he took the audience on his “Journey from Ideology to Science.” A new Water Resources session on Tuesday afternoon assembled a panel of experts to further the discussion of climate change and its impact on water resources. If you were unable to attend, or would like to review a paper presented at the conference, most of the papers are available on the Annual Conference page of www.ncsafewater.org.

There were plenty of activities for attendees with a competitive spirit. Refer to the following pages for winners of the golf tournament, pipe tapping contest, operations challenge, and best tasting water contest.

Many people and organizations were recognized for their achievements throughout the conference. (Refer to the following pages for a list of award winners.) Among those recognized were the 5-S inductees who continued the tradition of collecting money for the NC Safewater Endowment. Their efforts earned $2,842.56 to add to the annual scholarship fund.

Thank you to everyone who worked to coordinate the conference and to everyone who attended, including the exhibitors and sponsors. Working together, we created a great conference!

Mark your calendars now and plan to join us for the 96th Annual Conference November 12-15, 2017 in Raleigh, NC!
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- Kelly Boone, CDM Smith
- Jeff Coggins, Black & Veatch
- Ryan LeBlanc, Charlotte Water
- Hank Lewis, Charlotte Water
- Wendell Pickett, City of High Point

Student Poster Contest
- 1st place: Noyes Harrigan – UNC Charlotte
- 2nd place: Mikayla Armstrong – UNC Chapel Hill
- 3rd place: Henry Ricca – NCSU

NC Safewater Fund Scholarship Recipients
Carol Bond/Lynn & Lars Balck Water Environment Stewardship Fund/Rivers & Associates Clean Water Education Fund
Haley Brinkley, North Carolina State University

Environment Manufacturer’s Representative Scholarship Fund
Eric Polli, North Carolina State University

Frank & Susan Stephenson Water Environmental Scholarship Fund
Meredith Bullard, North Carolina State University

Les & Elaine Hall Water Environmental Stewardship Fund
Caleb Bynum, North Carolina State University

NC Safewater Fund
Mikayla Armstrong, University of North Carolina at Chapel Hill

Raftelis Financial Consultants Environmental Finance and Management Scholarship
Megan Murray, Duke University

Safewater Fund/GHD Clean Water Fund
Zachary Hopkins, North Carolina State University

Carol Bond Fund Scholarship for Middle and High School Environmental Educators
Carrie Jones, Middle Creek High School

AWWA Scholarship Recipients
ARCADIS Scholarship
Mikayla Armstrong, University of North Carolina at Chapel Hill

Dave Caldwell Scholarship
Alma Beciragic, University of North Carolina at Chapel Hill

Holly A. Cornell Scholarship
Katherine Connolly, University of North Carolina at Chapel Hill

Student Poster Contest 1st place: Noyes Harrigan – UNC Charlotte.
Student Poster Contest 2nd place: Mikayla Armstrong – UNC Chapel Hill.
Student Poster Contest 3rd place: Henry Ricca – NCSU.
2016 Award Winners

NC Stockholm Junior Water Prize Winner
Joshua Zhou, North Carolina School of Science and Mathematics in Durham

WEF Membership Tenure Awards
WEF Life Members
35 cumulative years of membership & at least 65 years of age
Arnold Bennie Goetze, Jr.
Alan Rimer

AWWA Member Tenure Awards
Recognizes individual members who have provided valuable service and support for AWWA programs and goals through their long-standing Association membership.

Life Members
30 cumulative years of membership & at least 65 years of age
Michael Richardson, Cape Fear Public Utility Authority
David M. Heiser, CDM Smith
James McCarthy, Hazen & Sawyer P.C.

Silver Water Drop
25 cumulative years of membership
William H. Armstrong, Armstrong Glen, P.C.
Tim Bailey, Town of Cary
Tim R. Bishop, Heyward Incorporated
Joseph F. Bonarigo, III, Ford Meter Box
Dan K. Boone
Philip M. Brower, Cape Fear Public Utility Authority
R. Daniele Brown, Roanoke Rapids Sanitary District
Stephen J. Brown, Town of Cary
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Jeanie P. Childers, City of Kannapolis
Charles J. Christy, Wade Trim, Incorporated
Jimmy A. Clark, City of Conover
Russell G. Colbath, City of Monroe
David L. Collins, CDM Smith

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• Carl Daniel, Carolina Water Service Inc.
• Michael E. Dean, Hoke County Utilities
• James C. Diehl
• Joel J. Ducoste, North Carolina State University
• Kevin E. Eason, City of Reidsville
• Randall D. Emory, Greenville Utilities Commission
• Franklin W. Frazier, City of Henderson
• Terry R. Freck
• Donald T. Garbrick, Labella Associates, PC
• David J. Gardner, Jr., City of Rocky Mount
• Brian C. Gav, City of Raleigh
• Ronald A. Geiger, HDR Engineering, Inc.
• Randy G. Gould, Moore County Public Works
• G. Robert Graham, George Finch/Boney & Associates, P.A.
• Donald F. Greeley, City of Durham Water Management
• Arthur T. Green, Town of Siler City
• Connie M. Gross
• David A. Hamilton, Arcadis US, Inc.
• Diane R. Hardison, Domtar Paper Co, LLC
• Ronald L. Hargrove, Jr.
• Richard J. Haugen, Rockingham Public Works
• Robert A. Haun, Jr.
• Randy M. Hawkins
• Harold Herring, Neuse Regional Water & Sewer Authority
• John L. Hodges
• Edward A. Holland
• John C. Huber, Charlotte Water
• Lenwood F. Hudson, Jr., City of Statesville
• James S. Hughes, Dellinger Inc.
• Jeffrey A. Hughes, Environmental Finance Center
• Benne C. Hutson, McGuire Woods, LLP
• Gary A. Iversen
• Detlef R.U. Knappe, CCEE Dept., NC State University
• Vinod Korategere, Brown & Caldwell
• Archie W. Lambert

• Kevin T. Laptos, Black & Veatch Corporation
• Angela C. Lee, Charlotte Water
• Albert V. Lewis, Jr., McDavid Associates, Inc.
• Melanie A. Mann, Hazen & Sawyer
• James McCarthy, Hazen & Sawyer P.C.
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• Alan L. Stone, Hazen & Sawyer
• Joel L. Storrow, McGill Associates P.A.
• James N. Struve, Hazen and Sawyer, P.C.
• Matt A. Thomas
• K. Richard Tsang, CDM Smith
• Carel Vandermeheyden, Cape Fear Public Utility Authority
• Kenneth L. Vogt, Jr., Cape Fear Public Utility Authority
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50 cumulative years of membership
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• Zheng Ming Michael Wang, Hazen and Sawyer
• Ralph L. Waters, Di Con Consulting, P.C.
• Anthony G. West
• Danny W. Williamson, City of Concord Water Resources
• Charles A. Wills, Jr., Willis Engineers
• Kenneth R. Workman
• Richard J. Wyche, RK&K

Disaster Preparedness Award, Individual
• John McLaughlin, Merrick & Company
• Jack Moyer, AECOM

WWTP Operations & Maintenance Excellence Award
• Greenville Utilities Commissions Wastewater Treatment Plant – Eastern Region
• Town of Apex Reclamation Facility – Central Region
• Water & Sewer of Cabarrus County, Rocky River WTP – Western Region

Pipe Tapping Contest
1st place men’s team: City of Concord
2nd place men’s team: Union County
3rd place men’s team: City of Raleigh

Operations Challenge Contest
• 1st place overall: Charlotte Water Operational Hazards
• 2nd place overall: Union County Sewer Rats
• 3rd place overall: MSD Flow Motion

Best Tasting Water Contest
• 1st place: Neuse River
• 2nd place: Kings Mountain
• 3rd place: City of Raleigh
2016 Award Winners

Operations Challenge Contest 1st place overall: Charlotte Water Operational Hazards.

Operations Challenge Contest 2nd place overall: Union County Sewer Rats.

Operations Challenge Contest 3rd place overall: MSD Flow Motion.

Communication Committee
Photo Contest Winners
Critters Around Us & Member’s Choice
Hannah Headrick, NC DWQ

Environment
Anna leRoux, Brunswick County Public Utilities

Our Members at Work
Southham Vannavong, City of High Point

Structures
Steve Walsh, BASF

Leadership Development Program
2015 – 2016 Mentees & Mentors
The people listed below represent the inaugural class of mentee and mentor pairs and recognizes their completion of this program designed to facilitate member development for leadership roles within NC AWWA-WEA and/or our parent organizations AWWA and WEF, enhance member benefits, sustain strong leadership of NC AWWA-WEA, and expand networking opportunities.

• Tom Bach, City of Concord & Leslie Jones, Brown and Caldwell
• Nick Dierkes, Brown and Caldwell & John McLaughlin, Merrick & Company
• Derek Dussek, HDR & Crystal Broadbent, Hazen and Sawyer
• Tony Martin, Black and Veatch & Barry Gullet, Charlotte Water
• Tony Mencome, Heyward Incorporated & TJ Lynch, City of Raleigh

Special Recognition
The following mentee/mentor pairs are recognized for their participation in the inaugural class, and for their important contributions towards the formation of the Leadership Development program.

• Sherri Moore, City of Concord & Ryan LeBlanc, HDR
• Courtney Driver, City of Winston-Salem & Robert Walters, Davidson Water

Certificates of Appreciation
2016 Outgoing Board Members
• Greg Morgan, Union County – Professional Wastewater Operators Representative
• Jeff Coggins, Black & Veatch – Secretary
• David Saunders, HDR – Treasurer
• Ron Hargrove, Charlotte Water – Trustee
• Ryan LeBlanc, Charlotte Water – Trustee
• Chris Belk, Hazen and Sawyer – Past Chair

2016 Nominating Committee Chair
Mike Osborne, Black and Veatch

2016 Outgoing Council Chair
Betsy Drake, Town of Cary – Technical & Education Council

Kasey Monroe Outstanding Service Award
Greg Morgan, Union County

2015 - 2016 Leadership Appreciation Awards
Board Chair 2015-2016: Julie Hellmann, Heyward Incorporated

George W. Burke, Jr. Safety Award
Mebane Bridge Wastewater Treatment Plant

Wastewater Laboratory Analyst Excellence Award
Amanda Hill, Town of Mebane

William D. Hatfield Award
Melinda Ward, City of Eden

Arthur Sidney Bedell Award
David L. Wagoner, CDM Smith

WEF Service
Thomas Johnson

Walter J. Courmon Safety Award
Union County Public Utilities

George Warren Fuller Award
Barry Shearin, Charlotte Water

AWWA American Water Landmark
City of High Point, Arnold J. Koonce, Jr. City Lake Dam

Kenneth J. Miller Water For People Award
Paul Judge, NC DEQ

Raymond E. “Red” Ebert Award
David Wichtl, Town of Morehead City

Safe Water Maintenance Technologist of the Year Excellence Award
Jamie Chandler, Town of Marshall

Donald E. Francisco Educator of the Year Award
Mark Wessel, City of Raleigh

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W. K. Hile Company
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Conference at a Glance

Greg Fishel speaking during Opening Session.

Jaqueline Torbert, AWWA Vice President.

Jackie Jarrell, WEF Trustee.

Golf Check-in, (L-R) Paul Briggs and Eddie Sasser.

Jeff Ray (L) and Ray Cox (R) with Opening Session speaker Greg Fishel (centre).

NC Safewater Endowment Auction.

NC Safewater Endowment Auction.
Chair’s reception

(L-R) Ben Silvers and Brett Fisher at the Chair’s Dessert Reception.

(L-R) Karen Tsang and Gary Hager considering their auction bids.

Ray Cox provided entertainment for the Chair’s Dessert Reception.

Chair’s Dessert Reception.

(L-R) Steve Shoaf and Jonathan Lapsley at the Chair’s Dessert Reception.

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NC AWWA-WEA invites you to join us at the Blockade Runner Beach Resort in Wrightsville Beach for the 16th Annual Spring Symposium. The symposium will take place April 2-4, 2017 when the weather will be quite comfortable! Over the last few years, the event has been titled ‘Spring Conference,’ but this year we have re-titled the event to the “Annual Spring Symposium.” The Spring Symposium Committee is excited about the new name change, and hosting the event at the beach.

Monday and Tuesday will feature technical sessions on water, wastewater and special topics, running concurrently with the Operations & Maintenance track. All of the informative sessions will give certified operators and professional engineers a chance to earn their continuing education credits while expanding their knowledge base of the field. Six credit hours will be offered each day.

There is no better place than the beach in April during the beautiful spring season! Enjoy all the amenities that the Blockade Runner has to offer; or tour the area and enjoy the local cultural flavor. There will be plenty to do and lots of people to meet during this special event.

This year’s Spring Symposium Committee is currently working on putting together an awesome event for attendees. We hope you will join us in Wrightsville Beach! To join the committee, please contact Mary Knosby at 704-338-6857 or at mary.knosby@hdrinc.com.
Is my water SAFE?

WATER QUALITY CHALLENGES

IN THE NEWS

Theme Coordinator: Kelly Boone
Theme Leaders: Tom Bach, Lori Brogden, Marco Menendez

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Choosing Treatment Options Now to Comply with Potential Future Drinking Water Regulations

By William B. Dowbiggin, CDM Smith

The Safe Drinking Water Act (SDWA), the key federal law passed over 40 years ago to help ensure safe public drinking water, applies to every public water system in the nation. The SDWA and its amendments over the years identify and list unregulated contaminants that may require regulation, and then regulate contaminants as shown in the regulatory process flow chart (Figure 1). The SDWA requires the Environmental Protection Agency (EPA) to develop a new Contaminant Candidate List (CCL) every five years to identify contaminants for possible future regulation. The EPA uses this list to prioritize research and data collection efforts, which support the regulatory determination process.

Because the EPA wants its regulations to be scientifically defensible, it takes an average of 15 years to produce a regulation. For a contaminant that the EPA has determined to regulate, the EPA has a target of 24 months to propose the regulation, and then 18 months after proposal to finalize the regulation.

As you move from the left to the right of this diagram, the amount and specificity of the supporting information needs to be greater.

The EPA reviews each existing national primary drinking water regulation every six years (Six-Year Review) and revises it, if appropriate. This means public water system operators must keep current on possible future regulations for drinking water so they can be proactive rather than reactive to changes and additional requirements.

### Eight Compounds to Be Watching Now

Eight potential categories of compounds are poised to become regulated drinking water compounds in the future:

- Perchlorate
- Strontium
- Additional Disinfection Byproducts (e.g., Nitrosamines and Chlorate)
- Algal Toxins
- Trace Organic Chemicals (where meaningful opportunity for health risk reduction)
- Cr (VI)
- Carcinogenic Volatile Organic Compounds (VOCs)
- Lead and Copper Rule Updates

Let's take a brief look at these and how to prepare your water systems for regulation.
The EPA has decided to regulate perchlorate under the SDWA.
North Carolina is one of the top 15 states in the nation with perchlorate contamination in public drinking water systems. While no requirements for public water system operators have yet been specified, the EPA is developing a proposed National Primary Drinking Water Regulation for it. Perchlorate is both a naturally occurring and man-made chemical used to produce rocket fuel, fireworks, flares, and explosives. Perchlorate may also appear in bleach and some fertilizers. Its Final Regulatory Determination was given in February 2011.

Best practices to remove perchlorate include: ion exchange, reverse osmosis (RO), and nanofiltration. Two other developing removal options are adsorption with modified/tailored granular activated carbon (GAC) and biological removal.

Even though its final regulatory determination has been delayed, strontium should remain on your watch list.
As a natural and commonly occurring element, strontium can be both water soluble and insoluble. Strontium compounds, such as strontium carbonate, are used to make ceramics and glass products, pyrotechnics, paint pigments, fluorescent lights, medicines, and other products. Strontium can also exist as radioactive isotopes.

Moderate concentrations of strontium are naturally found in Southeastern streams, including those in NC. With a chemistry similar to calcium, several options exist to remove it: (1) ion exchange (greater than 99% removal), RO (greater than 99% removal), adsorptive media (up to 99% removal), co-precipitation followed by microfiltration (greater than 99% removal), and powdered activated carbon coupled with ion exchange (greater than 90% removal).

Disinfection by-products (DBPs) such as N-Nitrosodimethylamine (NDMA) and chlorate are under EPA scrutiny, landing them third on our list of eight categories of compounds to watch.
Of the hundreds of DBPs reported, only 11 are currently regulated for public health concerns, including trihalomethanes (THMs), haloacetic acids (HAAs), chlorite, and bromate. Some DBPs are associated with increases in cancer risks, and there are concerns they may impact human reproduction and development. NDMA and other nitrosamines and other DBPs, such as chlorate, are being considered in the third six-year regulatory review for the DBPs that is currently underway. Chlorate’s health reference level (HRL) is 0.21 mg/L. The EPA has calculated a screening level of 0.42 ng/L for NDMA based on a 1 in 10⁻⁶ lifetime excess cancer risk (NDMA January 2014 Technical Fact Sheet).

The key to chlorate treatment is controlling chlorate formation when producing and using chlorine dioxide, bleach, or onsite chlorine generation. Methods of doing that include (1) altering the pH of chlorine dioxide generation and/or lowering chlorine dioxide dose, (2) minimizing degradation of hypochlorite solutions by controlling temperature and duration of storage and by using less concentrated hypochlorite solutions, (3) specifying low chlorate concentrations in bulk hypochlorite bleach purchase specifications, and (4) using fresh GAC or other technology to remove chlorate. See Figure 2.

The fourth new potential category strives to control algae and algal toxins.
Algae blooms are increasing in severity, impacting coagulation and compliance with turbidity limits and filter run times by filter blinding. Taste and odor are negatively impacted by two VOCs in blue-green algae: Geosmin and 2-Methylisoborneol (MIB). Algal toxins may be best controlled through algae control techniques (see Figure 3) then treatment with PAC, GAC, or oxidation.

As many as 16 carcinogenic VOCs may soon be regulated as a group.
Only the tip of the iceberg is currently regulated for organic chemicals and DBPs. While 53 organic chemicals such as the herbicides Atrazine and Glyphosate (found in Roundup) are already regulated, about 10 million organic chemicals do not have drinking water limits today. This VOC group regulation is the only imminent new synthetic organic chemical (SOC) limit. Updating its 2009 provisional advisory status, the EPA has established in 2016 health advisories for two perfluorinated organic chemicals (PFOS and PFOA). The EPA’s Unregulated Contaminant Monitoring Rules continue to seek new contaminants.
for meaningful regulation, resulting in listing chemicals such as 1,4-Dioxane, which has had multiple detections in NC.

Chlorine is the inexpensive disinfectant that most utilities use for primary disinfection. However, its use must be balanced by DBP formation, and it provides only small removals of certain organic chemicals by oxidation. Coagulation/flocculation with alum or ferric coagulant plays an important role in removing hydrophobic compounds bound to particles that are typically removed by coagulation, but is ineffective at removing dissolved compounds. GAC regeneration or replacement frequency is a very important consideration for effective SOC removal. Carbon selection is vital; correct distribution of pore volume is necessary for compound removal. See Figure 4.

Chromium (VI) is currently regulated as part of Total Chromium MCL at 0.1 mg/L, but its possible future individual limit could be about 0.01 mg/L, as currently regulated in California. Chromium-6 occurs naturally in the environment from the erosion of natural chromium deposits. It can also be produced by industrial processes and released to the environment by leakage, poor storage, or inadequate industrial waste disposal practices. The Environmental Working Group of the NRDC reported Cr(VI) in 31 of 35 cities tested in late 2010. The EPA is now reviewing data from a 2008 long-term animal study by the Department of Health and Human Service’s National Toxicology Program, which suggested that chromium-6 may be a human carcinogen if ingested. Based on this information, the EPA began a rigorous and comprehensive review of its health effects in 2008. The EPA will consider this and other information to determine whether the drinking water standard for total chromium needs to be revised. Three primary methods for its removal from drinking water include ion exchange, reverse osmosis, and reduction/coagulation/filtration.

A Lead and Copper Rule Revision by the EPA is possible for 2017. Corrosion control is important for all distribution system infrastructure, and lead and copper are key factors in corrosivity. The Flint, Michigan water quality incident gives significant attention to this issue moving forward. Lead and copper rule updates are likely to push for removing lead service lines. Related to distribution systems, the EPA developed draft guidance for technologies for Legionella control in building plumbing systems in 2015.

Progressive utilities must keep their eyes on contaminants of emerging concern. Progressive utilities need to be aware of what’s coming, implement appropriate monitoring programs, and evaluate potential technologies to remove and/or control these contaminants of emerging concern (CEC) for public health protection.

About the Author
Having designed over 50 major water plant projects – ranging in size from 1 mgd to 225 mgd – CDM Smith Senior Vice President William B. Dowbiggin, PE, BCEE (dowbigginwb@cdmsmith.com) works to stay ahead of the ever-evolving regulation curve. Bill has over 30 years of experience in water and wastewater studies, water treatment plants design, permitting, research, and pilot testing.
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Challenges of Antibiotics and Antimicrobials in Water Resources

By Dr. Olya Keen, UNC Charlotte

Pharmaceuticals, along with other trace synthetic organics, were detected in water resources for the first time in the 1970s, but did not become a household topic until the early 2000s. At that time, a national reconnaissance study found prevalent presence of a wide spectrum of trace organics in US waters. The study was picked up by the Associated Press, and soon the concern about these ‘emerging contaminants’ or ‘micropollutants’ found its way to the general public.

Some of the concerns are associated with specific classes of emerging contaminants. For example, antibiotics and antimicrobials in the environment have been associated with the increased presence of antibiotic resistant genes. The rise of the superbugs is one of the major medical challenges that society is currently facing. Antimicrobials, such as triclosan and triclocarban, present in soaps and other personal care products, were among the compounds implicated in contributing to the development of antibiotic resistance in the environment. Those chemicals were recently banned, mainly because there was no difference in antimicrobial effectiveness between soaps that contained antimicrobials and those that did not. Antibiotics belong to another class of emerging contaminants connected to the development of antibiotic resistance. Phasing those out is obviously not something that can be or should be done. Therefore, the burden lands on wastewater treatment plants, which are typically the main source of human-use antibiotics in the environment.

Antibiotics are not regulated in effluent, and most wastewater treatment plants are not designed to address them. By their nature, antibiotics are not biodegradable. Most of the attenuation in wastewater treatment happens in chemical treatment processes, specifically disinfection. Both chlorine and UV disinfection are effective against certain common antibiotics. However, each process is selective: it works well for some antibiotics and not at all for others.

For UV disinfection, the dose is typically too low to have an effect. A typical UV dose used for wastewater disinfection is in the vicinity of 40 mJ/cm². A much higher dose is needed to be effective against antibiotics. Figure 1 shows the level of antibiotic attenuation with 2000 mJ/cm² (50 times the typical disinfection dose). Much better results were seen with a medium-pressure mercury vapor lamp. However, this was the result of the photochemical reaction of nitrate in the effluent. Most of the treatment plants that nitrify their water opt for low-pressure mercury vapor lamps, since nitrate absorbance can interfere with disinfection. Their main goal is disinfection rather than destruction of antibiotics. Low-pressure mercury vapor lamps were only effective for ciprofloxacin and penicillin. They are also effective for another common antibiotic, sulfamethoxazole, but it was not included in this study. Full-scale studies show no attenuation of antibiotics at typical disinfection doses.

Chlorine can be fairly effective at the typical doses and contact times. However, it is also selective. Reasonable attenuation of pharmaceuticals at typical disinfection doses can take minutes to days, depending on the compound.
of days is possible in the drinking water distribution systems, wastewater treatment plants have much shorter contact times (minutes to hours), which makes this process selective as well. Most of the current available data for reactivity of emerging contaminants with chlorine is for general pharmaceuticals, and information on reaction rates specifically for antibiotics is sparse.

Additionally, questions still remain about the products that might form as the result of the reaction between antibiotics and chlorine, or as a result of the reactions during UV exposure. Experiments with high doses of UV revealed that products that form during photolysis of antibiotics lose their ability to inactivate the organisms for which the original antibiotic was designed. This suggests that once the antibiotic is chemically transformed by UV, it no longer poses the threat of causing antibiotic resistance. Although such data is currently not available for the fate of antibiotics during chlorination, research is underway.

To minimize the concentrations of antibiotics reaching wastewater treatment plants, utilities can be proactive in educating their customers about proper pharmaceutical disposal. A fairly large percentage of the population (mainly made up of older people, who also happen to be those taking the most prescription drugs) is still unaware that flushing their expired medications is not the correct disposal method. Even disposal with solid waste is not a solution, as leachate from landfills is commonly sent to wastewater treatment plants. The best disposal method is the collection boxes at pharmacies and drug collection drives organized by law enforcement. Pharmaceuticals collected via those methods are disposed of by incineration or chemical digestion. Certainly, responsible prescription should be part of the solution, but it is outside the sphere of influence of wastewater treatment plants.

While antibiotics, and pharmaceuticals in general, are not currently regulated in effluent discharges, the situation may change in the future. One antibiotic, erythromycin, has been on the EPA Contaminant Candidate List since the third iteration (CCL3) and remains in the current draft of CCL4. What this means for wastewater and drinking water utilities remains to be seen.

**About the Author**

Dr. Olya Keen is an Assistant Professor in the Department of Civil and Environmental Engineering of the University of North Carolina – Charlotte. She received her Bachelor's degree in Civil Engineering and Master's degree in Environmental Engineering from the University of South Florida in 2008, and her Ph.D. degree in Civil Engineering from the University of Colorado at Boulder in 2012. Her research focuses on developing advanced treatment processes for emerging environmental contaminants in wastewater.
From a Trickle to a Roar: A Day in the Life of Water Communicators

By Susan Moran, APR, and Carrie Roman, Town of Cary

On September 21, 2016, the Public Broadcast Service (PBS) posted the story, “What is chromium-6 and how did it infiltrate America’s drinking water?” Um, we don’t know, and we don’t know…and, well, honestly, do we really care?

That’s what we thought when we came across the story a day later. Then we read the story’s lead: “Chromium-6, the cancer-causing chemical best known for its role in the Erin Brockovich story, has been found at higher-than-recommended levels in the tap water supplying two-thirds of all Americans, according to a report from the Environmental Working Group.”

Yuck! Okay, now we know (sort of, not really), and now we ABSOLUTELY care because if Julia Roberts stars in it, it’s a big deal, right? And big deals are just the kind of thing that triggers outcries from our water customers – AKA the ‘Drinkers.’

But who can blame them? Our Drinkers don’t usually have a choice in their water service (ouch – cable TV, anyone?).

Now that we knew we cared, it was time to channel our inner Julia and get to the bottom of what was going on with hexavalent chromium right here in River City. That meant contacting Utilities Director Jamie Revels.

“Chromium-6, the cancer-causing chemical best known for its role in the Erin Brockovich story, has been found at higher-than-recommended levels in the tap water supplying two-thirds of all Americans, according to a report from the Environmental Working Group.”

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What the what, Sweet Baby James? He responded 12 hours later (full disclosure: SBJ is allowed to sleep; he was emailed at 11:57 p.m. and responded at 11:46 a.m.) with EXACTLY what we needed: “The short answer is we’re doing OK with hexavalent chromium and don’t consider this to be a problem in our water system.”

GOLDEN! As communicators, we were done and onto the next alert. But not SBJ; he’s a subject-matter superhero who wouldn’t leave it at that. Charts, fact sheets, alerts from American Water Works Association (AWWA) – everything we needed to get down and dirty with any Drinkers who needed reassuring. And yes, we did have one (yep, one/uno).

A few days later, a former employee pleaded guilty in federal court to charges associated with water sampling fraud. As sad as this was, it wasn’t a surprise to those in our organization who needed to know (no thanks to our brothers and sisters at the Department of Justice who sent out a big fat news release to the entire galaxy about it). The incidents had occurred more than 18 months prior. It would be, however, a surprise to our Drinkers.

Once again, SBJ, this time ably assisted by a happy band of other superheroes, made sure we were ready to help our Drinkers. Thanks to the reams of relevant information about our water quality during the tragic fall from grace, we were able to show that our water was and is safe. Whew!

We could go on and on. Lead. Fluoride. Algae. It doesn’t stop, and since it won’t, we’d like to offer you a few tidbits to help you help your Drinkers with what comes next.

Establish, maintain, and promote communications channels.

By now, everyone should have a website where Drinkers can easily find timely, accurate, and complete information about their drinking water, including the annual water quality report. Make your site your system’s encyclopedia. But your website isn’t enough because it requires your Drinkers to change their habits. You also need to know where they’re going for other sorts of information and meet them there. Once you find them, point them to the place on your website where they’ll find answers. Many of these places will be happy, supportive and fun places to be – such as ‘green thinkers’ among a community environmental group – but don’t forget to be where your foes may lurk.

Consider: Local newspapers, radio, and television, homeowners’ association newsletters and water bills; coffee shop bulletin boards; social media sites like NextDoor, Facebook, Google+ and Instagram.

Know your water supply and system inside and out.

Whether it’s a lake, river, or well, your water supply is a living thing that changes, and many times the changes are recurring and the impact to your Drinkers is predictable based on the capabilities of your treatment processes. Become the trusted superhero by using your records and experience to prepare Drinkers for upcoming changes like taste and odor seasonal drought response. And put their minds at ease by knowing – and telling – which contaminants are and are not a concern for them.

Consider: Entering awards competitions, developing and sharing easily consumable pieces – like infographics and short videos – to explain complicated aspects of your utility operations.
Be the uber consumer.
You need to stay ahead of your Drinkers by being ‘that customer.’ Obsess over what’s being said about drinking around the world. Your first step is registering with the AWWA whose public affairs team does a great job in communicating potential Drinker concerns. Look for applicable articles in the most unorthodox places – every outlet is 24-hours now, forcing so many of them to go outside of their usual coverage topics to find something to say. Another easy, inexpensive way is to create Google Alerts for news stories with relevant search terms. Of course, you’d want to include your water system’s name, but don’t stop there.
Consider: YOUR COMMUNITY’S NAME water, drinking water, lead, fluoride in water, lead in water, sick drinking water.

Don’t go it alone.
If you’re involved in an issue – always think potential crisis – assemble a trusted, diverse team who can help you chart a successful course, one which must include proactive, accurate, reliable, timely, consistent, and complete communications with your Drinkers. Without information from you, the situation will quickly spiral to the lowest, most outrageous level. So don’t allow an information vacuum to occur.
Consider: Experts in communication, law, water resources, and utility billing.

Always tell the truth and nothing but the truth.
If you get asked a question, answer it. If it’s a yes/no question start with yes or no, then explain, just like SBJ did for us with chromium-6. But remember: whenever you’re dealing with an issue, there’s always the mathematical potential for the problem to double. It happens when you think Drinkers don’t really need to know what’s going on. Wrong! Now you have two problems: whatever the real one is and the one you just created, which, despite your best intentions, will be called a cover-up. Maybe it’s just a little thing, like not providing copies of every single text message for a public records or Freedom of Information Act (FOIA) request. Who needs all of those anyway? And who’s going to know? Um, well, their recipients will not only know, but you can bet they’ll tell. You see, those folks are smart; they’re not going to lose their jobs or go to jail. Love you, but...
Successful communications about drinking water, employee malfeasance, PLACE YOUR TOPIC HERE all come down to three points:
• What do you want people to KNOW?
• What do you want people to FEEL?
• What do you want people to DO?

These three questions can guide you and your team to creating a communications effort that makes a difference. Of course, it always helps if you can channel your inner Julia!

About the Authors
Carrie Roman and Susan Moran are part of the communications team for the Town Manager’s Office at the Town of Cary, NC.
The adage ‘water is life’ took a whole new meaning after my experience in Asanquiri, Bolivia. In May 2013, a team of seven, including me, traveled to Asanquiri as part of Engineers Without Borders-USA (EWB-USA) to implement a rainwater harvesting system for the Technical Center of Humanistic Education in Asanquiri (Centro de Educación Técnica Humanística Asanquiri or CETHA). The 2013 rainwater harvesting system doubled the community’s water supply from 15 to 30 liters per person per day (lppd). According to the World Health Organization, humans need a minimum of 50 lppd to meet basic water requirements for hygiene, drinking water, and food preparation.

EWB-USA is a non-profit organization that strives to “build a better world through engineering projects that empower communities to meet their basic human needs and equip leaders to solve the world’s most pressing challenges.” North Carolina State University’s EWB chapter has three projects: Sierra Leone Renewable Energy, Sierra Leone Water Systems, and Bolivia Water Sanitation (BWS). The NC State EWB chapter initially selected the BWS project in 2005, focusing on water treatment, with one of the nine communities near Arampampa, Bolivia. In 2006, a team of four traveled to the different communities, assessed their needs, and determined how they could best address them. Through interviews with the communities and rainfall data analysis, the assessment team concluded that the main concern was water availability during the local dry season (May through October). Additionally, the assessment team concluded that CETHA was the optimal location to implement and sustain a water storage project, and would be able to best reach out to its surrounding communities.

As a Biological and Agricultural Engineering student concentrating in Environmental Science, I was most interested in the BWS project. On family vacations to Manila, Philippines, my family and I would spend many hours sitting in traffic. I remember one stretch of road that had a canal alongside it. On the other side of the canal was a slum area where I saw the different uses of the canal. One house had a brown sludge pouring into the canal and, just a short distance downstream, someone was washing their clothes. Seeing the need for clean water and being a part of EWB NC State Chapter allowed me to find and develop my passion in water resources, as well as gain hands-on experience with concepts taught in my course lectures. It was not until my trip to Asanquiri in 2013 that I was able to not only see the need for clean water, but also experience it first-hand. The lack of clean water in the area made project construction, hikes, and soccer games somewhat difficult in the semi-arid climate and high elevation (approximately 13,500 ft. above sea level). The main local source of water is an underground spring that becomes nearly dry four months of the year. During this time, showers are limited to once a week or less, and students struggle to stay hydrated. Many times, they collect ice blocks from the mountainside and drink runoff water, resulting in dysentery.

CETHA is a year-round technical school, funded by Save the Children.
Canada, which focuses on agriculture and hygiene education. This technical school houses young adult students from five neighboring communities, allowing them to have hands-on livestock farming and greenhouse growing experiences. To accommodate the community’s needs for supplementing their stored water, a team of four installed a rainwater harvesting system in 2009. This system provided 5,000 liters of stored water for use during their dry months. CETHA houses approximately 60 students, which prompted the BWS team to reconstruct their project goals to supplement the water supply to 40 lppd, increase the water capacity year-round, and to improve the students’ ability to stay hydrated, nourished, and hygienic during the dry season.

From the redefined goals, an assessment team traveled again to CETHA in 2011 and completed an alternative analysis on developing an upper spring source, installing an additional rainwater harvesting system with a purchased tank, improving an open catchment, and installing a rainwater harvesting system with an abandoned septic tank. The project team decided to utilize the abandoned septic tank as a rainwater harvesting system reservoir based on capital cost, operation and maintenance costs, demand of water met, time demanded to construct and maintain, and the community’s preferences. BWS spent the next two years after the 2011 assessment trip designing the rainwater harvesting system. The design consisted of two main components: the rainwater harvesting system and the reservoir. The rainwater harvesting system included gutters to collect rainfall from the roof, a first flush diverter to filter debris, and piping to lead the rainwater to the septic tank. The septic tank, abandoned in 2003 in favor of compost latrines, sits on the mountainside, downhill from the professors’ dormitory and above the greenhouse. Design components for the reservoir included installation of effluent and cleanout valves, patchwork on an existing large hole, and a cement lining. The system was designed to collect rainwater from the professors’ dormitory because of its dual pitched roof, proximity to the reservoir, and its large surface area of about 1761 sq. ft. The gutters angled downwards to the north side and ran the length of the building. At the end of each gutter, a downspout constructed of PVC led to a T-joint, connecting downward to a first flush diverter, and then outwards to the storage tank. On the western side of the building, the downspout connected to a PVC pipe that lightly sloped downwards towards the junction with the eastern downspout. The first flush system hung vertically from the gutter and also included a threaded cap at the bottom to allow easy access for clearing debris, and a plastic ball to help seal the dirty first flush water from the cleaner rain water. As the diverter filled up, the ball floated on top of the water and created a seal, which then diverted the cleaner rainwater into the buried flexible polyethylene piping leading to the reservoir. The reservoir is approximately 30 ft. down a steep incline.

“Seeing the need for clean water and being a part of EWB NC State Chapter allowed me to find and develop my passion in water resources, as well as gain hands-on experience with concepts taught in my course lectures. It was not until my trip to Asanquiri in 2013 that I was able to not only see the need for clean water, but also experience it first-hand.”

Abandoned septic tank cleaned and flushed out for a water reservoir.

Downspouts and first flush diverters on the north side of the professors’ dormitory.
from the professors’ dormitory. Sika Top Seal 107 cementitious waterproofing and protective slurry mortar was used as a cement lining for the interior of the reservoir to prevent water seepage.

After passing the designs through the Technical Advisory Committee of EWB, the project team focused on logistics for the travel team, including materials, construction, assessment plan, and communication. Interestingly enough, this proved to be the most challenging aspect of the project. Our main communication was through CETHA’s manager, Damian Sirpa, via Skype. One of the key components for our project was for it to be sustainable. To accomplish this, we prepared a lesson plan and maintenance checklist to educate the students on the rainwater harvesting system, and made sure that all of the supplies could be purchased from a local hardware store in Cochabamba, Bolivia. By showing them the process and being able to purchase locally, the professors were ensured that they could independently repair their rainwater harvesting systems as required, and could replicate it in neighboring communities.

In 2013, six engineering students, a mentor, and I traveled to Bolivia for two weeks to install the rainwater harvesting system. We spent our first couple of days exploring La Paz, adjusting to the altitude, and ironing out our logistics and schedule for the next two weeks. After our stay in La Paz, we traveled eight hours to Cochabamba. Riding on the second floor, front row seats of a double decker bus, I felt like I was in an IMAX movie featuring Altiplano, the grand high plains of Bolivia. It was a truly breathtaking view. The Altiplano opened up into a desert that stretched on for miles. There were a few towns nested along the highway and empty streambeds surrounding them. We made a couple of stops for a bathroom break, but I could not bring myself to get off the bus as the towns seemed almost like ghost towns with a few llamas and dogs roaming about. As we left La Paz, the bathrooms went from flushing water toilets to compost latrines that were essentially large holes in the ground. Still freshly adjusting to the new culture and country, I was not yet ready...
for that experience. Once we arrived in Cochabamba, we bought our supplies and met up with Damian. Cochabamba is the closest city to CETHA and also where it was possible to buy all the materials for the rainwater harvesting system. Although this was the closest town, Asanquiri is so remote that a round trip still takes over eight hours.

On our first day in CETHA, we were warmly greeted by the professors and students. The first part of the day was spent touring the campus and getting to know the students. During the tour, they showed us the goat and cow pasture, the poultry house, and the guinea pig house. It was a little odd to see that there were no livestock in the pastures, especially at an agriculture school. We later learned that they could not sustain the animals. I could not help but be a little concerned that the students and professors would be unable to maintain the rainwater harvesting system and that our language and culture barrier would make it too difficult to work together. It was very encouraging, however, when the students and professors asked us many questions about the rainwater harvesting system, our culture, language, and the different kinds of animals and crops we farm.

After the introductions, we assessed and prepared our worksite: digging trenches to lay the pipes, and cleaning the abandoned septic tank. Everyone in the school worked with us to complete the preparations. This was a huge help because we were not prepared for how difficult the physical labor would be at such a high altitude. The professors and students were always willing to help us throughout the project. Though we were only with them for one week, it felt as if we had all been working on this two-year project as one. After we finished all of our tasks for the day, we played some tunes on the guitar with the students. In return, they held a culture night for us where they performed dances, sung songs, and played windpipe instruments. Though we could not understand what they were singing, and vice versa, we could really feel the warm welcome and sense of community.

What amazed me the most was how everyone there was full of life despite their hardships. It was reassuring that professors set aside a lot of their time learning about the rainwater harvesting system and methods to teach it to not only the students at CETHA, but also the neighboring schools. The 2013 rainwater harvesting system was able to provide them with 30 lppd of water, almost reaching our project goal of 40 lppd. Working side by side with the students and learning more about their culture was such a rewarding and humbling experience, helping to further develop my passion for water resources.

References


About the Author

Angelica Pura graduated from North Carolina State University in 2014 with a BS in Biological and Agricultural Engineering, with a concentration in Environmental Science. She is currently a CAD Technician transitioning into the Water/Wastewater Department at McAdams.
It was a chilly February afternoon and we had just stopped for lunch at King’s Hot Dogs in Rural Hall, NC. Planted in a sea of asphalt and yellow parking lines, King’s was a local town treasure that made you feel privy to a cherished secret as you pulled up to its landscape of weathered picnic tables and faded Pepsi-Cola umbrellas.

I was with a group of hikers that were a part of the Climb for Water (CFW) team – a group founded in 2011 that raises funds for Water For People, an organization that helps people in developing countries improve the quality of life by supporting the development of locally sustainable drinking water resources and sanitation facilities. We had just completed one of our first training hikes for CFW’s fourth expedition to Mt. Washington and the hot dogs were our reward for a climb well done.

After a crash course in the intricacies of southern sides – hush puppies? They’re like clumps of fried corn… pimento cheese?? That’s like super chunky cheese-spread… where are you from again?! – I sat down with my ketchup-smothered hot dog and properly introduced myself to the group. I was with CFW veterans who in years past had climbed Mt. Kilimanjaro in Tanzania, Africa (2011); Pikes Peak in Colorado (2012); and Cotopaxi in Quito, Ecuador (2014). Among the group was Kraig Kern (W. K. Dickson & Co.) who founded CFW in 2011, and the late Paul Judge, a beloved CFW member who was committed to NC AWWA-WEA Water For People. We devoured our beef franks as we discussed the upcoming trip. The climb would be here before we knew it, and we needed to begin our fundraising campaigns. The group chatted on, an inviting chorus of laughter and comradery, reminiscing like the old and trusted friends that they were. I cautiously took a bite of my first apple fritter and looked up to see Paul smiling warmly. This was a tightly-knit group, and I was grateful to be there.

About a year prior, I had met Kraig at a North Carolina American Council of Engineering Companies (ACEC/NC) event. I was new to the area and eager to start meeting other professionals in my field. Kraig and I instantly bonded over our experiences climbing Mt. Kilimanjaro, as well as our professions as non-technical marketers navigating our way through the engineering industry. The conversation quickly turned to CFW and we chatted excitedly about potential future climbs and shared our climbing bucket lists. An organization that raises funds for Water For People by climbing mountains and incredible peaks?! I knew I had just stumbled into something I wanted to be a part of. We clinked glasses, exchanged information and, within a few months,

CFW’s fourth expedition raised nearly $8,000 for Water For People. Our team thanks our many supporters and all who donated to this cause. Pictured from left to right: Chad Faulkner, Phil Cannon (front), Peter Hughes, Kraig Kern, Amy Hayes, Brian Faulkner, Tasha Lewis, Lisa Edwards, Tony Hatton, Linda Meyers (lower right), and Kara Meyers (lower left).
CFW’s fourth expedition – and the hotdog training hike – were on my calendar.

Ascending Mt. Washington was breathtaking. If you have never traveled to New Hampshire or taken in the fresh air of the northern east coast peaks, I promise it will lift your spirit and touch your soul. And for many, including myself, climbing is sometimes a solitary experience – it’s a time for self-reflection and introspection, a time to assess how far you have come and where you still want to go. Paul’s passing in March 2016 reminded us all of the fragility of life, and just how fast and finite our time really is. I thought back on the last two years. Although I cannot pinpoint the exact moment when it happened, or what served as its catalyst, at some point and by some extraordinary means, a fire lit within me. Not just a tamed fire with a few crackling logs, but a blazing fire that filled me with passion and a burning desire to succeed.

A little over two years ago, I relocated to Raleigh from Minnesota to join CDM Smith’s marketing team. While joining a new group and learning a new service sector had its challenges, I plunged into my role and refused to let the fact that I was not an engineer – or that I was a woman in a male-dominated industry – stand in my way. I was determined to join every committee, subcommittee, and organization that I could, and I resolved to attend every technical session, industry conference, and networking event available to me. I was going to ask for more responsibilities, volunteer to take on new and different things, and go above and beyond any expectations that had been set for me.

I remember being nervous on my drive to meet the CFW team for our first training hike; feeling unsure of myself, and worrying that I would not have the time or the ability to climb alongside the others. And I felt this way before attending and participating in many other industry events, too. But had I listened to any of that self-doubt, decided I was too tired to attend a networking event, or too busy to involve myself in a group like CFW, I would not be where I am today. I am a proud board member of the American Public Works Association (APWA) NC Stormwater Management Division; a founding member of the APWA-NC Young Professionals Committee; and an active member of multiple committees and subcommittees with the NC AWWA-WEA, including the NC Water For People Committee. I also volunteer with the MATHCOUNTS Foundation and will soon be working with the RTP Professional Chapter of Engineers Without Borders.

My point to all millennials is this: take initiative and get involved. No one approached or asked me to join or participate in any organization; I took it upon myself to seek out the information, ask questions, and get myself involved. If a marketer from Minnesota can dive headfirst into the North Carolina engineering community, you can too. We are the future of this industry, so get to know your peers, make connections, and foster those relationships. Don’t wait for opportunities to present themselves; take the initiative to get involved and connect with others in your field. Attend conferences, networking events, and industry socials, and look for ways to give back to the community in creative and meaningful ways, like CFW. Don’t just aspire to find a job that you love; aspire to build a meaningful and rewarding career. You alone are responsible for the progression and trajectory of your professional path – take accountability and responsibility for your own success.
The 6,288-foot ascent of Mt. Washington was no walk in the park. Our team journeyed up the Lion’s Head Trail and traversed 4,000 vertical feet in just four miles, including several hundred yards of steep and unstable bouldering. Slowly but surely, the CFW team gathered at the top to celebrate another successful climb – and to celebrate and honor a beloved team member who, albeit not physically, had climbed right beside all of us each step of the way. Some of Paul’s closest friends gave him a beautiful tribute that day, at the top of the mountain, as the sun warmed our cheeks and the fresh mountain air danced around us. The day could not have been more beautiful, nor the climbing conditions more perfect; all of us knew who to thank, and we did, and still do.

To date, CFW has raised nearly $50,000 for Water For People. Be a part of the next expedition – and play a meaningful role in the future of this industry. Let’s get involved and give back, together.

Ways to Get Involved:
- http://climbforwater.org
- www.waterforpeople.org/get-involved
- www.ncsafewater.org/group/WaterForPeopleCmte
- www.ncsafewater.org/default.asp?page=GROW
- www.apwa.net/YoungProfessionals
- www.ascenc.org/about-eastern-ymg
- www.awwa.org/membership/get-involved/young-professionals.aspx
- www.awwa.org/membership/get-involved/volunteer.aspx
- www.rtpewb.com/get-involved/volunteer
- www.mathcounts.org/get-involved/volunteer

About the Author
Kara Meyers, BA, MA, is a proposal coordinator and marketing writer for CDM Smith. This was her first climb with CFW. For more information on ways to get involved, connect with Kara at linkedin.com/in/kara-meyers or Meyersk@cdmsmith.com.

Update on the NC AWWA-WEA Water For People 5Ks

Earlier this summer, the NC AWWA-WEA Water For People Committee hosted the 7th annual 5K in Charlotte and the 3rd annual 5K in Raleigh. The proceeds from both races exceeded $8,000 and the total number of registrants was more than 180. Congratulations to Eli Kaczinski and Christine Wittle for winning the overall men’s and women’s race in Charlotte, and to Clark Maness and Sarah Nash for winning the overall men’s and women’s race in Raleigh. The Committee would like to thank all of the sponsors and supporters for their contributions and for making the events this year the most successful Water For People 5Ks to date! The Committee plans to continue hosting the 5K races each year to not only continue raising funds for Water For People, but to also spread awareness of Water For People and its mission for clean water and sanitation around the world.

For more information or to volunteer with the 5K planning committee for the 2017 Water For People 5ks, please contact Justin Nielsen (nielsenjc@cdmsmith.com), Will Rice (wrice@ci.charlotte.nc.us), or Lamya King (lking@hazenandsawyer.com).
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Welcome New Members!

The following people became members of NC AWWA-WEA in July, August, or September of 2016 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. 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. 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)**
- Shay Bennett, City of Henderson
- David Brooks, V, OWASA
- Amber Buckhahn, AESC Utility Cloud
- Troy Chipp, Eijkelkamp North America, Inc.
- Steve Coleman, Ferguson Waterworks
- Brian Drake, Town of Cary
- Luke Eastman, NRDC
- Jonathan Garrick, Aquanomix
- Marc Houle, Yarborough-Williams & Houle, Inc.
- Alexandra Jones, Town of Cary
- Oscar Larach, Ecorain America, LLC
- Joey Page, Town of Mooresville, Rocky River WWTP
- Eric Peterson, Amiad Water Systems
- James Proctor, Town of Ayden
- Jens Scheideler, WEDECO a Xylem Brand
- George Selembo, InfoSense
- Shawn Shahamat, Accelerated Technology Laboratories, Inc.
- Ryan Smith, City of Monroe
- Kenneth Stevens, Jr., City of Kinston
- Marty Stone, Town of Apex
- Sawyer Walters

**Water Environment Federation (WEF)**
- Gorav Atreya
- Ruth Borgmann, Hazen and Sawyer
- Michael Bovenzi
- Chris Brigman, Fayetteville Public Works Commission
- Evan Brown, Environmental Operating Solutions, Inc. (EOSi)
- Ann Carraway
- Kim Chavis, Fayetteville Public Works Commission
- Troy Chipp, Eijkelkamp North America, Inc.
- Tim Coates, Metropolitan Sewerage District
- Roger Floyd, Fayetteville Public Works Commission
- Aarón Forbis-Stokes, Duke University
- Alice Fulmer, Water Research Foundation
- Kelly Hefner, Advanced Drainage Systems, Inc.
- Amanda Hill, City of Mebane
- Ashley Kabat
- Kyle Manning, City of Durham
- Tony Martin, Charlotte Water
- Samuel Peach
- Sarah Perkins
- Pavol Segedy, HDR, Inc.
- Kenneth Stevens, Jr., City of Kinston
- David Wolf, Heyward Incorporated
- Sarah Wu
- Joshua Zhou

**NC SLAM**
- Kevin Alexander, City of Eden
- Jeff Andrews, City of Raleigh
- Garland Apperson, City of Winston Salem
- Brandon Ashton, AH Environmental Engineering, PC
- Paul Autry, City of Winston Salem
- Stephen Balmer, City of Raleigh
- Jesse Bragg, City of Winston-Salem
- Wes Bramlett, HIGHFILL Infrastructure Engineering P.C.
- Jeff Camp, Greenville Utilities
- Jesse Carter, City of Eden
- Shawn Carter, City of Eden
- Duran Collins, Town of Boone
- Will Cooksey, Preload, LLC
- John Craft, ONWASA
- Ed Cronin, Greeley and Hansen
- Terry Ennett
- Katie Fleming, Charlotte Water
- Eric Ford, Town of Blowing Rock
- William Goss, City of Winston-Salem
- Catrina Gunn, WK Dickson
- Kevin Hardee, Greenville Utilities Commission
- Eric Haugeard, City of Raleigh, Public Utilities
- William Hedrick, Piedmont Triad Regional Water Authority
- Dameon Johnson, The Town of Spring Lake
- Andrew Jones, Kimley-Horn
- Steve Kaufman, City of Raleigh
- Joel Keller, City of Raleigh
- Chris Kiger, City of Winston Salem
- Steve Leitch, CJS Conveyance, PLLC
- Jason Lynch, Town of Gibsonville
- Roy Lyons Jr., Durham County
- Stephanie Malec, HIGHFILL Infrastructure Engineering PC
- Keith Marshburn, City of Raleigh
- Irshad Martin, City of Winston Salem
- Manny Melendez, Henderson Water Reclamation Facility
- Christopher Mickey, Jr.
- Larry Murr, City of Raleigh
- Jerry O’Neal, City of Raleigh
- Del O’Toole, Town of Spring Lake
- Karen Preston, Greenville Utilities
- Crystal Respess, Greenville Utilities
- Lynn Rutledge, City of Winston Salem
- David Schumacher, Hach
- Aaron Sheppard, MT/Kennedy Valve
- Will Shull, HDR Engineering, Inc.
- Kyle Smith, Neuse Regional WASA
- Rachel Smith, City of Mount Holly
- Ennis Sykes, City of Goldsboro
- Andrew Taylor
- Alexander Thomas, Town of Spring Lake
- Dennis Thomas, City of Burlington
- Jeff Thompson, Black & Veatch
- Dale Tiska, City of Raleigh
- Mark Underwood, Town of Boone
- Van Welborn, Piedmont Triad Regional Water Authority
- Casey Wilson, City of Roxboro
- Brian Wood, Town of Boone
- Spencer Yates, City of Greensboro
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COLLECTION SYSTEM CERTIFICATION QUESTIONS

Provided by the NC AWWA-WEA Wastewater Board of Education and Examiners

1. Which cannot be used to remove chlorine from effluent?
   a) Sodium sulfite  
   b) Sulfur dioxide  
   c) Granulated activated carbon  
   d) UV light  
   e) Sodium metabisulfite

2. Dissolved oxygen levels are important in order to maintain adequate conditions for biological treatment. Why is it a good idea to avoid excessive DO levels?
   a) Avoid wasting energy  
   b) Build floc structure for good settleability  
   c) To optimize mean cell residence time  
   d) A & B  
   e) All of the above

3. One of the greatest advantages of a complete mix activated sludge system is:  
   a) The aeration tanks may be designed in any convenient shape or size to fit the available area  
   b) Less air is required than in a conventional aeration system  
   c) It has an increased ability to absorb sudden surges in organic loading without degradation of effluent quality  
   d) The ability to properly balance nutrients

4. While performing microscopic evaluations of conventional activated sludge to determine microorganism predominance, you will probably notice that as the MCRT value increases you observe:  
   a) Less stalked ciliates and more amoebae  
   b) Less rotifers and more flagellates  
   c) Less stalked ciliates and more free-swimming ciliates  
   d) Less flagellates and more rotifers

5. High organic solids in the grit removed from a grit chamber indicates:  
   a) Greater slope is needed in the grit chamber  
   b) The velocity is too high and the detention period too short  
   c) The velocity is too low and the detention period too long  
   d) The grit chamber is operating properly

Answers: 1. d)  2. d)  3. c)  4. d)  5. c)

CERTIFICATION INFORMATION

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

NC Board of Examiners for Engineers & Surveyors
919-791-2000
www.ncbels.org
Exam Dates: 4/21/17, and 10/27/17
Responsible for Professional Engineers and Professional Surveyors

NC Water Treatment Facility Operators Certification Board
919-707-9040
http://www.ncwater.org/pws
Traditional Exam Dates: 2/23/17, 5/25/17, and 8/31/17
Electronic Exam dates: 3/28/17, 7/25/17, and 9/26/17
Responsible for Drinking Water Certifications
(Surface, Well, Distribution, & Backflow/Cross-Connection)

Water Pollution Control System Operators Certification Commission
919-807-6353
http://portal.ncdenr.org/web/wq/admin/tacu
Exam Dates: 3/19/17, 6/8/17, and 9/14/17
Responsible for Wastewater Certifications
(Animal Waste, Biological WW, Physical/Chemical, Land Application, Spray Irrigation, Collections, Subsurface, and OIT)
WATER CERTIFICATION QUESTIONS

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

1. What type distribution system configuration is recommended?
   a) Tree type  
   b) Loop type  
   c) Continuous type  
   d) Steady type

2. Which of these is not a common type of joint used with ductile iron pipe?
   a) Push on  
   b) Ball and socket  
   c) Mechanical  
   d) Groove and slot

3. What does OS&Y mean when describing a valve?
   a) Over Side and Yield  
   b) On Side and Yoke  
   c) Outside Slide and Yoke  
   d) Outside Stem and Yoke

4. Stray-current corrosion is caused by _________.
   a) Aggressive water  
   b) Soil conditions  
   c) Uncontrolled electrical current flowing through the pipe  
   d) Dissimilar metals being adjacent to each other

5. Name one type of positive displacement meter.
   a) Oscillating piston  
   b) Multi jet  
   c) Venturi  
   d) Turbine

Answers:
1. b)  
2. d)  
3. d)  
4. c)  
5. a)
Starting in 2017, AWWA will enhance membership benefits for utility and service provider members. These changes provide more tangible value to members in a simplified package. “Members will experience the value they have come to expect, but packaged in a way that reduces confusion while creating more opportunity for involvement,” says AWWA Chief Membership Officer Susan Franceschi.

Specifically, AWWA will replace its current benefit system, Plus Points, with a package of benefits that maximizes the value of the former offering. This change affects Service Provider and Utility members with over 5,000 service connections.

“In the past, these organizations had to choose between receiving two key benefits: AWWA standards and individual membership for employees. Now they will get both!” says AWWA Senior Manager of Membership Melanie Penoyar. The benefits package is scaled to the size of an organization, allowing for an AWWA standards license and a guaranteed number of individual memberships.

Utilities with less than 5,000 service connections will experience the upgrade differently. A low dues rate along with an enhanced version of Let’s Talk Safety 2017 will be provided. In addition, free training opportunities may exist for those servicing populations of 10,000 or less.

These changes are a direct result of feedback from member surveys and interviews, collaboration with Sections, and recommendations from volunteer groups. All organizational members benefit from a robust suite of special communications, tools and discounts for all employees.

To maximize your benefits or learn more about utility and service provider membership opportunities, please contact AWWA at membership@awwa.org or 303-794-7711.

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Return the form with payment to AWWA

Learn more at www.awwa.org/2017upgrade
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- Integrated Grit Classifier.
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- Very few moving parts.
Angela Lee National Golden Manhole

Angela Lee, Chief of Operations for Charlotte Water, and NC AWWA-WEA Chair, was honored with the Golden Manhole award from the WEF Collection Systems Committee during WEFTEC in September 2016.

Happy Retirement!

Ricky Odom

Ricky Odom started with the City of Laurinburg in October of 1983 and retired in July 2016 after 33 years of service. He began his career with the city at the water plant, and moved to the wastewater plant in 1994, eventually becoming the wastewater chief operator. Ricky was a NC State Level Association Member (NC SLAM). Congratulations to Ricky and enjoy your retirement!

Michael Richardson

Michael Richardson, who has been a dedicated member of NC AWWA-WEA for over 35 years, retired as the Water Resources Manager of the Cape Fear Public Utility Authority effective September 2016 after a lifelong career of service to the water profession.

Mike served eight years on the Board of Trustees, including as Chair of the Board from 2004-2005. He also served on and supported many committees, including playing an instrumental role in founding the Disaster Preparedness Committee and the development of the annual Spring Conference. Mike is a founder of NC Water Wastewater Agency Response Network (NC Water WARN) and has served as Chairperson for five years, and played an instrumental part in the group’s growth during his tenure. He was inducted into the Select Society of Sanitary Sludge Shovelers in 2000, and was a recipient of the American Water Works Association’s George Warren Fuller Award in 2010.

In Memoriam

Russell P. Brice passed away on September 30, 2016. Mr. Brice was an active member of the American Water Works Association and Water Environment Federation for more than 30 years, and was awarded the William D. Hatfield Award in 1999. He worked as the Superintendent of the Water Reclamation Department for the City of Wilson for 25 years.

Freese and Nichols Adds Haberstroh, Abernethy to Raleigh Team

Freese and Nichols, Inc. has announced that Scott Haberstroh, P.E., and Kevin Abernethy, P.E., have joined the firm’s
Raleigh office. Haberstroh is a senior water/wastewater project manager specializing in pipelines, pump stations and treatment facilities, and Abernethy is a construction manager leading Freese and Nichols’ construction services throughout the state.

“The combined depth of knowledge that Scott and Kevin bring to the table is a tremendous asset for our clients here,” said Mike Wayts, Freese and Nichols vice president and North Carolina division manager. “Their comprehensive background in water/wastewater engineering and construction services will help us build on our successes and strengthen our relationships statewide.”

Haberstroh enhances Freese and Nichols’ capabilities with his experience in the design and rehabilitation of water, wastewater and stormwater infrastructure for municipal, federal and industrial owners. His current projects for Freese and Nichols include the process conversion design for the Catawba River Water Pollution Control Facility for the City of Morganton. In addition to managing strategic partnerships in the wastewater treatment and reclamation sections, Haberstroh has led various efforts to develop strategies to improve all aspects of day-to-day operations for clients.

A former United States Marine Corps engineer, Haberstroh earned his bachelor’s degree from Wentworth Institute of Technology in Boston, Massachusetts, and his master’s degree from North Carolina State University in Raleigh.

Abernethy leverages his extensive expertise in state and local processes to strengthen Freese and Nichols’ flourishing construction practice. His wide range of industry experience spans projects from freeways to research centers to sewer lines; he has managed construction administration, QA/QC programs, engineering and design, materials testing, on-site field inspections and other specialty engineering services. His current projects for Freese and Nichols include the secondary clarifier rehabilitation for the Neuse River Resource Recovery Facility for the City of Raleigh.

A United States Navy veteran, Abernethy earned his bachelor’s degree in construction engineering and management from North Carolina State University in Raleigh.

About Freese and Nichols
Freese and Nichols, Inc. delivers innovative solutions to clients across the country, providing architecture, engineering, environmental science, planning, energy, program management and construction services and a wide array of water/wastewater and stormwater solutions.

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services. A full-service professional consulting firm, Freese and Nichols is the first engineering/architecture firm to receive the Malcolm Baldrige National Quality Award. For more information, visit www.freese.com.

National Firm Expands Charlotte Office, Adds Regional Engineering Manager
August 16, 2016 (Charlotte, NC) McKim & Creed, Inc., a national engineering, geomatics and planning firm, continues to expand its presence in the Charlotte area with the addition of Donald J. Hamburger, PE, who has joined the firm as regional engineering manager of the Water Group in McKim & Creed’s 50-person Charlotte office.

Mr. Hamburger has 35 years’ experience with large-scale municipal water, wastewater and water resources projects throughout the Carolinas. In his role as regional engineering manager, he will handle all aspects of engineering project activity with a primary focus on the municipal water, wastewater and water resources market. He is also responsible for quality control, effective resource utilization, business development and growth.

Prior to joining McKim & Creed, Mr. Hamburger served as president and chief operating officer of B.P. Barber & Associates, a 225-person engineering firm with offices in Charlotte as well as throughout South Carolina.

“Don is a leader in the water, wastewater and water resources markets in North and South Carolina. Having been the president and COO of a well-respected engineering firm, he has extensive experience building engineering practices, expanding markets, and overseeing large-scale, complex projects. He also excels in developing long-lasting relationships with clients, and leading productive project teams that develop appropriate and workable solutions to client issues,” said Bryan Blake, PE, regional manager with McKim & Creed.

“McKim & Creed is well known in our area for excellent client relationships and high-quality engineering services, and I feel that this is an environment where I can effectively contribute to both the growth of the firm and our region’s pressing infrastructure needs,” added Mr. Hamburger.

McKim & Creed has experienced significant growth in its Charlotte office during 2016, adding 14 people to the local staff of engineers, surveyors, planners and administrators. More than
50 people work in the company’s Charlotte office, which provides a wide array of engineering, surveying and land planning services. “As a company, McKim & Creed is expanding throughout our geographic footprint, but that energy and growth are especially prevalent in the Charlotte area,” said president and CEO John Lucey, Jr., PE. “We are now the 20th largest civil engineering firm and the #1 geomatics firm in the Southeast. Our Charlotte location is our third largest office.”

McKim & Creed established its Charlotte office in 1994. Notable local municipal projects include the $50-million McAlpine Creek Relief Sewer and the Ramah Creek Interceptor project, both for Charlotte Water; the award-winning Catawba River 30-inch Water Main directional drill project for York County; and the Blythe Creek Interceptor Sewer for Union County.

**About McKim & Creed**

McKim & Creed is an employee-owned engineering, surveying and planning firm with nearly 400 staff members in offices throughout the US, including North Carolina, Florida, Virginia, Georgia, Texas, and Pennsylvania. McKim & Creed specializes in civil, environmental, mechanical, electrical, plumbing, and structural engineering; industrial design-build services; airborne and mobile LiDAR/scanning; unmanned aerial systems; subsurface utility engineering; and hydrographic and conventional surveying services for the energy, transportation, federal, land development, water and building markets. For more information about McKim & Creed, visit [www.mckimcreed.com](http://www.mckimcreed.com).

**Correction**

In the News & Notes section of the Fall 2016 issue of NC Currents, the photo of Matthew West was incorrectly listed with the announcement for Jim White with Mazzei. Matthew West is now an associate in Dewberry’s Raleigh, NC office. NC AWWA-WEA apologizes for this error.

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2017 Schedule of Events

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March 2017
9  Wastewater Laboratory Analyst Exam
   Wilson, NC
13-17 Coastal Collection & Distribution School
   Morehead City, NC

April 2017
2-4 Spring Conference
   Wrightsville Beach, NC
3-5 Utility Management Institute
   Raleigh, NC
24-27 Eastern Maintenance Technologist School
   Raleigh, NC
24-28 Eastern Biological Wastewater Operators School
   Raleigh, NC
25-28 Physical & Chemical Wastewater School
   Raleigh, NC

June 2017
1  Wastewater Regulatory Trends and Emerging Issues Seminar
   Raleigh, NC
11-14 AWWA Annual Conference & Exposition (ACE)
   Philadelphia, PA
12-15 Western Maintenance Technologist School
   Morganton, NC
12-16 Western Biological Wastewater Operators School
   Morganton, NC

July 2017
10-14 Western Collections & Distribution School
   Morganton, NC
27 Drinking Water Rules & Regulations Seminar
   Raleigh, NC

August 2017
24 Automation Committee Seminar
   To be determined

September 2017
25-27 Utility Management Institute
   Raleigh, NC
30-Oct. 4 WEFTEC
   Chicago, IL

October 2017
2-6 Central Collection & Distribution School
   Raleigh, NC
10 Wastewater Laboratory Analyst Exam
   Wilson, NC

November 2017
12-15 97th Annual Conference
   Raleigh, NC
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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/page/NCC](http://www.ncsafewater.org/page/NCC)) 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.

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<th>SPRING 2017</th>
<th>Funding and the Value of Water (Submission deadline January 9, 2017)</th>
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Utilities often struggle with issues surrounding the funding of water projects. Clean drinking water can be taken for granted. Many people outside of our field may not understand what they pay for in their water and sewer bill. This issue of **NC Currents** will explore how utilities educate the public about the importance of providing clean drinking water and the protection of our water sources and waterways and then ultimately fund projects. Essentially, how do we get both public and political support to protect, maintain and operate our water and wastewater systems? Examples may include: public education efforts, creative utility invoicing methods, funding options, justification methods for rate increases, and long-term planning efforts.

**Theme Leaders:** Steve Hilderhoff, Mike Shelton, Marie Sugar
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<td>Mechanical Equipment Co.</td>
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<td><a href="http://www.medoraco.com">www.medoraco.com</a></td>
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<td>Neptune</td>
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<td>Pete Duty &amp; Associates</td>
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