How Flint Ignited a Firestorm

INSIDE

- A Professional Look at Lead Sampling in Drinking Water
- Spotlight on Birmingham Water Works
- Marble Column
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PIPELINE is a publication of the Alabama/Mississippi Section of the American Water Works Association. PIPELINE is mailed to all members of the Section. In an effort to keep all community water system officials informed, the AWWA trustees voted to provide a complimentary copy to all community water systems within both states. This will help keep water systems current on events affecting the water supply industry and aware of products and services through the AWWA. Current circulation is over 2,900.

Articles and photographs are encouraged and appreciated. All submissions, comments, or other matters concerning this publication should be directed to:

AWWA PIPELINE
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Greetings from the Board

I wanted to give you a brief report on the goings-on here in our Section. Things continue to be busy, but our Section Manager, Jim Miller, and the talented individuals on our committees continue working diligently to keep things running smoothly. The work done behind the scenes to promote clean drinking water in our two states is to be applauded.

Our non-conference work continues to impress and reach new levels. Our Scholarship Committee is receiving and reviewing applications. These scholarships are for people pursuing or enhancing careers in the water industry, ranging from traditional college students, to operators obtaining advanced certification, to those seeking the initial training to get into the water business. All it takes is an application and a referral from a Section member. The Board has allocated up to $20,000 for scholarships this year and AWWA National has begun a new matching scholarship program for operators looking to expand their training and education. Our deadline has been extended to April 1. Don’t be an April Fool! Get your application in today. You can find a copy on our website.

Education Committee’s goal this year was to keep up last year’s record of one event each month in Alabama or Mississippi. We are on track to meet that. On March 3 we did SAFE Drinking Water Act Compliance training, eight hours’ worth, at Wallace State Community College in HANCEVILLE, Alabama. This training was provided free of charge due to a grant from EPA in cooperation with AWWA and the Rural Community Assistance Partnership (RCAP). We will provide this training again in Mississippi in early May, most likely in Clarksdale. June will bring additional training in Montgomery in conjunction with the Environmental Finance Center Network (EFCN). This class will be geared toward financial health for small systems. This will all be in addition to our own local training put on by our able Education co-chairs, Matt McDougald and Jason Barrett. Keep an eye on your email inbox for more info on all of our training opportunities.

As far as conference items, in January we had the second planning meeting for the upcoming October conference. Things are shaping up nicely and I think this year’s conference will be something you won’t want to miss. We will continue with the Operator’s track this year, but with a twist. We are planning on holding this training at the CT Perry Water Treatment plant in Montgomery. As part of a recent plant upgrade, top-notch training facilities were added. We’ll be doing a plant tour as part of this track, and include some hands-on classroom training. Meter Madness, Pipe Tapping and Water Taste Test will continue to be major parts of our competitions. We are working to bring last year’s inaugural Mini-Excavator Challenge indoors, adjacent to our Exhibit Hall. The Awards Committee continues seeking exceptional plants, operators, distribution systems, and young professionals to recognize. Get some well-deserved recognition for hard working water professionals. Nominate someone today. Applications can be found on our website.

There are lots of exciting things we are trying to bring together. Thanks to all the volunteers working on this in our various committees to make it all a success.

I said it last issue and it warrants saying again: Our goal is to be the go-to resource for water professionals in Alabama and Mississippi. We have a great Section, made up of great people striving to bring the highest quality water to the people of our states. Let’s let people know about that.
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An you remember the first AWWA Meeting you attended? My first meeting was the 1990 Annual Conference in Huntsville. John Almond, our regional manager, asked me if I had time to go to an AWWA Meeting in Huntsville. At the time, I knew very little about AWWA, but it seemed like a no brainer to take a few days away from work and go to a convention. At the time, John was the Editor of PIPELINE. Since John couldn’t attend the Section Meeting, part of my reason for going was to take pictures and prepare a report about the Annual Conference for inclusion in the next issue of PIPELINE. Before I left for the meeting, John asked me if I had a good camera with a zoom lens.

Not having one, he let me borrow his pride and joy, a brand new $1,500 Pentax camera with a 20x optical 200 mm zoom lens. I was instructed to take photos of all the exhibitors, educational sessions, and the other functions to be certain we had plenty of pictures of every event that was held at the conference. Once I arrived in Huntsville and began attending the different sessions, I realized this was much more than your normal technical conference. I was overwhelmed by the vast amount of water knowledge that was present at the meeting. There were water operators and managers who knew all about treating raw water and running water plants. Additionally, there were engineers who could design wells, treatment plants and waterlines for the operators and managers. There were even manufactures representatives who could help specify the right equipment as well as contractors who could build all of the infrastructure required to supply potable water. I quickly realized that if you were in the water business AWWA was the place to be.

Remember when cameras used film? Remember having to wait for someone to develop your pictures before you could see them? Back in 1990 it would have been very hard to imagine today’s world where young children have cell phones that take better digital pictures than John’s Pentax camera. Like cameras, the water industry has also evolved over the years and my AWWA Membership has been an invaluable tool to help stay abreast of current technology and standards.

Over the years, I served in every type of position from PIPELINE Editor to Section Chair and my knowledge and appreciation of AWWA has grown even more. Being in AWWA for 26 years has helped me so much professionally and personally and I encourage others to participate in AWWA to take advantage of the same opportunities.
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AWWA member value

Many of us have been members of the AWWA and the Alabama-Mississippi Section for years. Having been so we recognize the many benefits of membership. There is simply no more authoritative source for all things water than AWWA. Without the Association who would develop and publish the standards of our industry? Without the Association’s presence in Washington D.C. and in many state capitals who would monitor federal and state legislation relating to the regulation of water, its treatment and delivery? Each week during the Alabama legislative session briefings on legislation pertinent to the water industry is provided by email to members.

Alabama – Mississippi Section staff is involved in the Alabama Governor’s development of state water policy. The Section is represented in discussions involving water conservation and reuse and on several other committees which, ultimately, will advise the governor on a state-wide water policy. Thanks to the volunteers for their efforts in this area. Also, thanks to those of you who provided input on water loss/efficiency as we have started the conversation on what a policy in this area should look like.

Along with those activities and many others among the most important is providing for training and education of current and future practitioners in the water industry. The Association and its forty-six Sections work hand in hand to make information and education readily available and affordable.

In the Alabama-Mississippi Section the Board of Trustees who look out for your interests have made efforts to ensure we meet the educational and training challenges that an ever changing legal and technical landscape demands. Here are a few examples that you have heard me talk about before:

**EPA SMALL SYSTEMS GRANTS FOR TRAINING IN SAFE DRINKING WATER ACT REGULATIONS AND FINANCIAL MANAGEMENT**

By the time this article is published we will have begun a new year of providing excellent professional development classes funded by a grant from EPA. The Section delivered three of these classes last year which are geared for smaller systems to aid in compliance with the SDWA. The classes were well attended and the reviews were very positive. On March 3, 2016 a SWDA class was held at Wallace State College in Hanceville, Alabama. Over seventy-five operators attended. On May 3, a similar class is scheduled for Clarksdale, Mississippi. In addition, a class on financial management is being planned in Montgomery, Alabama. In all cases these classes which are rich with continuing education hours are provided at no cost to our members.

In January of this year the Section in cooperation with the Alabama Water Environment Association delivered an all-day Water Utility Management Seminar in Montgomery which was attended by about eighty water managers and professionals. A similar session is in the works in cooperation with the Mississippi Water Environment Association.

Of course later in this year one of the largest water conferences in both states will take place in Montgomery, Alabama at the Renaissance Hotel when the Alabama-Mississippi Section holds its annual conference there. But there is so much more available!

For those who are not able to travel easily to these sites there are many on-line opportunities for learning. The Section offers “360 Water” for operators to develop their skills from their place of work or from home. And that’s just from the Section!

AWWA offers the best educational opportunities available in the industry with venues across the country on every aspect of water and its management. In June water professionals from all over the world, more than ten-thousand strong, will meet for five days in Chicago at the AWWA International Convention and Exposition. AWWA also offers many on-line opportunities. Check out AWWA.ORG for their many “e-learning” offerings.

There are also excellent opportunities to increase your earning potential through education by competing for scholarships offered by both the Alabama-Mississippi Section and the AWWA. The Section will award around Twenty-thousand dollars in scholarships for Community College, Undergraduate, and Advanced degrees in areas related to water as well as to the Jacksonville State Professional Water Operator Program this year. There will likely be news soon on an AWWA program for Water Operator Training Scholarships which may be matched by the Section. For information on scholarships go to amsawwa.org and click the Scholarship Button.

That’s just a sample of what your membership in the AWWA and the Alabama-Mississippi Section can provide. It’s all there waiting for you. THE REST IS UP TO YOU!
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Personal Protective Equipment or PPE as most of you know can be very useful and sometimes taken for granted by those of us in the water industry. Sometimes we get in a rush and forget to grab it or wear it out in the field. Let’s make sure we keep these five key areas safe and always make it a habit to wear our PPE.

- Ear Protection- Ear plugs are important! Always use earplugs or earmuffs to protect you from loud noises. Long term exposure to 80-85 decibels or more can cause hearing loss without protection. It is not recommended to be exposed to 100 decibels without any protection for more than 15 minutes. Hearing loss can be permanent. Wear those plugs!

- Eye Protection- Eye hazards include metal slivers, dust, wood chips, cement chips, nails, or staples. To protect yourself you should wear safety goggles, face shields, or even full face respirators. Make sure that eye protection is adjustable so that it can fit and have good coverage for your eyes.

- Hand Protection- Make sure that you are wearing the proper gloves for the task since some gloves are designed for certain activities and may not protect you well enough when used for another task. Leather and canvas gloves protect against cuts or burns. Fabric or Coated Fabric protect from dirt, chafing, and are usually slip resistant when coated. Rubber or latex protect from harmful liquids but limit your grip and dexterity. Make sure to use the right ones for the job.

- Body protection- This includes coveralls, vests, jackets, aprons, and full body suits to protect from cuts, burns, chemical burns as well as impact from tools or machinery.

- Head protection- This includes wearing a helmet or hard hat to protect from impact, electrical shock, or burns.

Keeping these five areas safe will make for a lot safer work place and a whole lot healthier you. Don’t forget to wear your PPE operators, distribution, maintenance, and lab techs. Let’s stay safe out there.

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TPS Total Piping Solutions, Inc.

Article written by Eddie James, AL-MS Section of AWWA, Operators Co-Chair
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www.awwa.org/solutions
The Birmingham Water Works (BWW) has placed 10 among 125 leading organizations across America for its employer-sponsored training and development programs. While on the move, the utility has also been recognized for its security, ranking 28 among 500 enterprise security leaders.

“To be recognized as an organization with one of the most successful security measures, along with learning and development programs, in the world is pretty outstanding,” said BWW General Manager Mac Underwood. “It is because of staff and management’s collaborative efforts and dedication that we’ve been able to be successful.”
Our philosophy is we’re not the police. Everybody who is employed by the Water Works is a part of our department. Security is everyone’s business. If you see something, say something.

Training Magazine, a leading business publication for learning and development professionals, announced winners for its Training Top 125 Awards at its annual conference and exposition held in Orlando, FL. The water system received acknowledgment for its commitment to investing in staff, which was highlighted through its three leadership development programs. This year, the BWW placed ahead of organizations such as Best Buy, New York Life, WellSpan Health, BNSF Railway, AT&T, Sacramento Municipal Utility District and others.

“The Supervisory Training and Readiness program, along with our Leadership and Executive Leadership programs create a pipeline of well-trained and competent members of the workforce ready to achieve the company’s strategic goal,” said BWW Training & Organizational Development / Safety Officer Rhonda Lewis. “By incorporating real-life organizational challenges into the leadership training our employees are able to receive the skills needed to contribute to the overall success of the organization.”

Last year, the utility ranked 24 making a tremendous leap from 75 in 2014 and 95 in 2013. The organization has been recognized for its Leadership Development Programs that focus on topics such as supervisory training, executive leadership, succession planning, water resources and more.

For the past four years, the award-winning Security Department has received high marks in Security 500 — a ranking by Security Magazine, a publication that examines security threats, solutions and developments for security professionals. Annually, the reports determine forerunners in sectors such as agriculture, education, energy and utilities, information technology, manufacturing and more.

“Our philosophy is we’re not the police. Everybody who is employed by the Water Works is a part of our department. Security is everyone’s business. If you see something, say something,” said BWW Security Manager Scott Starkey. “This is quite an honor for us. The fact that Security Magazine included the Birmingham Water Works in its selection of the ‘Top 500 Security Leaders’ signals that our constant efforts towards business excellence are paying off. We are proud to be included in this recognition.”

Besides keeping the water supply secure, the department also enforces matters such as workplace violence prevention and robbery risks within the customer service center. Starkey said it’s a job that requires a lot of teamwork, which is a direct result of the pride and commitment of BWW employees and the support of its Board of Directors.

Article written by Dorian Kendrick, PR Supervisor, Lewis & Company.
As I write this report, the Mississippi legislature is in session and is dealing with a large number of issues. Of those reported out of committee, none appear to have any effect on the water industry.

HOWEVER, lead issues in the City of Jackson, while being dealt with effectively by the Mississippi Department of Health, may become a significant political issue. If so, this could result in activity in the legislature. We will be watching very closely. As a result of the well-publicized issues in Flint, Michigan, lead issues are fast becoming an issue with national implications. Many of you are aware that the EPA is currently reviewing the Lead and Copper rule. AWWA is actively involved in providing input to the EPA in regard to any changes and/or adjustments. I participated in a fairly lengthy conference call with the AWWA WUC in regards to this issue. The WUC will also be discussing this issue immediately following the Fly-In in April.

In reference to the Fly-In, Chris Bryson, City of Ridgeland, and I will be traveling to the annual Water Matters Fly-In in mid-April to meet with the Mississippi delegation. While the agenda is not quite firm, two of the major topics will be infrastructure needs and lead. If anyone has any issues that they wish to discuss (or not discuss) please notify me as soon as possible.

As always, I’m available to discuss any concern you may have regarding government activity.

Article written by Mark Snow, AL-MS Section fo AWWA Governmental Affairs Co-Chair MS.
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With all this concern and media/political blitz about lead in the drinking water, I feel it is my duty to use my personal knowledge to help ease anyone’s concerns.

Lead in drinking water is primarily a result of the corrosivity of the water coming into contact with lead that is in people’s plumbing and pipes in their homes.

Sampling procedures for collection of water samples for lead analysis call for the homeowner to pull a first draw sample first from a faucet that has not been used in the last 8 hours. As the water sits in the plumbing any lead that it comes into contact with is leached into the water so when you first turn on that faucet, you will capture water that is more representative of exposure.

The real key in seeing if the sample result is a valid sample of exposure is if the homeowner collects this sample first thing in the morning from the last faucet that was utilized the night before. Unfortunately not all homeowners will collect the sample correctly. Some will collect it after the faucet has been running and by the time they have collected it in the sample bottle, any lead that was in the plumbing has been flushed out and a low amount if any will be recorded. On the other end of the scale, some homeowners will collect the sample from a faucet that has not been used which will result in a reading of a high level of lead in the sample.

The second scenario is the reason why there is an immediate resample and in a lot of cases, the high level was a result of the sample being collected improperly to be more representative of potential harmful exposure.

Yes lead is a concern in the water that is being supplied, but the real defense to ensure that you and/or your children are not continuously exposed to high levels of lead that likely is coming from your plumbing is to allow the water to flush a little bit by letting it run for a bit before getting that first drink of water and you will be assured to reduce any potential exposure to any lead that may be in the water in your faucet.

Flint, Michigan was an unfortunate situation, but it most certainly is not an indicator that there is a serious problem in all of the water that is being supplied by the many hard working water utilities in our nation. Feel free to share and if you want to read a little more about how EPA regulates lead in the drinking water being supplied, you are welcome to check out EPA’s website: http://www.epa.gov/dwreginfo/lead-and-copper-rule

A Professional Look at Lead Sampling in Drinking Water

By Harry Gong, P.E.
Small towns, big cities and Main Street, USA, wherever you go, there we are. AMERICAN has been part of the landscape for over a century. While our past is one of innovation, the same is true of our future. New products are always in the pipeline. When it comes to someone you can trust with your valve and hydrant needs, look no further than AMERICAN. The company where strength, dependability and integrity just come with the territory.

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The mission of the Jacksonville State University Office of Continuing Education is to source for workforce development programs that will offer job retraining in emerging career fields. Working in collaboration with general managers, superintendents, Grade IV operators and other key individuals within the Alabama/Mississippi Section of the American Water Works Association (AWWA) and the Alabama Water and Wastewater Institute (AWWI), Jacksonville State University’s Office of Continuing Education set out to develop a certification program that serves the training needs of individuals, municipalities and industry, alike.

Careers in the water or wastewater treatment field have been identified as ‘high-wage, high-impact’ jobs and have been approved for Workforce Investment Act (WIA) funding by the Alabama Department of Economic and Community Affairs (ADECA) Workforce Development Division. This funding is earmarked for individuals who are seeking training in approved career fields. Contact your Alabama Career Center System to determine your WIA eligibility. This program is mobile, so if your locale is outside Alabama, please contact the Career Center System in your area. This program is available from anywhere in the United States.

The Alabama/Mississippi Section of the American Water Works Association has scholarships available for individuals interested in pursuing careers in the water works industry in Alabama and Mississippi. Visit their website to download an application and view the process: www.almsawwa.org.

The Alabama Water and Wastewater Institute (AWWI) will be providing valuable scholarships for plant operator candidates within its member utilities. If you are employed by an AWWI utility, please contact your manager for more information.

PROGRAM ADMISSION REQUIREMENTS

- High school graduate (or GED)
- Current driver’s license
- At least 18 years of age to apply
- Proficient in reading and math at the grade 10 level. Will be tested by CareerLink and Jacksonville State University
- Complete the Jacksonville State University application and interview process
- Commit to the 26-week program and passing the Grade IV exam
- Must pass a drug screen and extensive background check
- The superintendent at the internship location will be given the option to meet the intern and will have the right of refusal for their location

PROGRAM TIMELINE AND CURRICULUM

- The program curriculum follows the material provided in Volumes I and II of the California State University (CSU), Sacramento, Water (or Wastewater) Treatment Plant Operation Field Study Training Program. Participants will be monitored by the Jacksonville State University Office of Continuing Education to ensure progress through the material and will proctor chapter exams. Volume I will be completed by self-study and progress will be monitored by the Jacksonville State University Office of Continuing Education. The participant may choose to study at home or at the Jacksonville State University McClellan campus. Volume I must be completed within three weeks. This includes passing all eleven chapter tests (proctored by Jacksonville State University). After CSU certifies that Volume I is complete, the participant will be assigned to a water or wastewater treatment facility for a 22-week internship.
- Study in Volume II will begin once the participant is on-site at the water treatment facility. The participant will be required to complete all chapters in Volume II along with the accompanying tests. Participants will learn both by reading and hands-on exposure to the tasks covered in Volume II (always under the supervision of qualified operators at the facility).
- Participants will work up to 20 hours per week on-site. Scheduling will be at the discretion of plant superintendent and may be on any shift. In addition to the 22-week internship, the participants will be required to attend 40 hours of classroom training. This training will consist of exam prep and tutoring in the areas of need. Every effort will be made to source instructors and tutors from within the facility where the intern is working, if available, and compensated for their time. If not available at that location, we will seek recommendations from general managers and superintendents.
• On occasion (in lieu of a 20-hour week), Jacksonville State University will invite general managers, superintendents and Grade IV operators to talk with the interns. These speakers will address the water industry in general and their own experience as it relates to the path to management. The speaker(s) will also encourage interaction and answer any questions about issues that arise in their leadership role as well as any other topics of interest, i.e., advancement potential.

PROGRAM COMPLETION
• After the completion of all training elements, the participant will apply to the Alabama Department of Environmental Management (ADEM) to take the Grade IV (Water or Wastewater) exam.
• Once ADEM approves the application, the participant will be notified and scheduled for the exam.
• If the exam is passed, the student must also have 1900 hours of on-the-job experience prior to ADEM issuing the official certification. After ADEM issues the certification, Jacksonville State University will bestow the designation of ‘Certified Water Treatment Professional.’

For more information, please contact:
Belinda Blackburn, Director
Jacksonville State University
Office of Continuing Education
JSU McClellan Education Consortium
100 Gamecock Drive, Anniston, AL 36205
Phone: (256) 782-5956    Email: blackbur@jsu.edu

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Can the Flint, Michigan water controversy be a timely example for infrastructure change, for reflection on our own operator training program, and our roles in public awareness about their forgotten water supplies?

For months I have seen news stories talking about the “corrosive river water” or that officials used “corrosive chemicals” and the change in chemicals “corroded the pipes,” which resulted in lead contamination in the taps of thousands of public water customers in Flint, Michigan. As reported, these statements are inaccurate and misleading the public. In my experience, reporters craft a story concerning public water only after consulting people who they believe to have some knowledge about the issue. Let’s face it, chemistry is not a core curriculum for a journalism degree. So assuming these authors of news stories did their homework properly, including conducting interviews with water system officials, how are these inaccuracies still getting published? It is so important that we as water professionals help guide the media to write their stories factually and correctly by explaining the facts using easy-to-understand terms, even giving them the appropriate words to use. Public water safety and drinking water chemistry is way too easily misunderstood by the media and reporting about drinking water issues deserves thoughtful and intentional guidance from all public water professionals.
Various news stories I’ve read also indicate that switching from Detroit water to the Flint River water treated by the city’s own water treatment plant was a concept somehow pushed upon the citizens by a seemingly greedy and corrupt state government that only wanted to save a buck. As a wholesale customer of the Detroit Water and Sewerage Department (DWSD) since 1967, Flint was experiencing an average increase in water charges of more than 6 percent per year in the last decade of its contract. In April, 2013 the city council voted 7 to 1 to partner with the new Karagondi Water Authority (KWA) to save millions of dollars in purchased water costs by bringing untreated surface water from Lake Huron to the city. Their plan was to remain on DWSD water for the next three years until their water treatment plant could be upgraded and a new KWA raw water pipeline to Flint could be completed in 2016. What most news stories forget to tell us, is that upon learning of Flint’s decision to cancel their wholesale water contract approximately 36 months down the road, DWSD appealed to the state, trying to stop Flint from changing water suppliers, which would leave Detroit with a $16M annual loss in sales revenue. The state treasurer’s office could find no legally compelling reason to stop Flint from pursuing this decision, but did encourage DWSD to make a counter-offer. Detroit did make an attempt to negotiate, but water purchased from KWA was still far less expensive, and Flint declined. DWSD responded by cancelling its contract with Flint in just 12 months, leaving the city to find an alternative water source for the interim. The city’s old 1950’s era water treatment plant had served as an emergency backup water supply to the city since 1967, and as such, had only been operated a few hours each quarter to keep it functional. It would need significant improvement to make it suitable for full-time operation, but the city optimistically stepped up the rehabilitation plan to get it done within the year. They had planned on upgrading their water treatment system anyway to accommodate the KWA water by 2016, so now they just had to accelerate everything to get it on line by April 2014. To illustrate the monetary value of this decision, and why the city council was so favorable to adopting it, consider the annual cost of water purchased from DWSD in the final year of the contract. It was about the same as the total cost of engineering and construction to upgrade the water treatment plant plus one year of all operational costs to include additional staffing. The city’s cost to source the water in 2015 using their own upgraded treatment plant would save $9 million in that year alone.

The switch from Detroit wholesale treated water to KWA, even with the necessary upgrades in treatment, would have saved the city millions of dollars in purchased water costs and prevented the council from having to raise water rates by as much as 30 percent. In fact, the cost savings by making the switch would have allowed the city to finance much needed and overdue future water distribution system repairs. This fiscal reality of their new plan incentivized the city leadership and fiscal emergency manager to make it work in spite of the challenges. Printed media, radio, and television news reports suggest that the state appointed fiscal emergency manager’s frugal management caused this problem. I disagree. This nightmarish incident did not occur because the Governor or the fiscal emergency manager was trying to be cheap nor did it occur because the wrong water source was used. Flint’s bad drinking water occurred in part because of a calamitous series of events, some of which go back decades and result from inadequate funding for the responsible maintenance of a buried and forgotten, yet completely essential public health infrastructure. Flint’s dire economic condition made it even more challenging to build a sustainable water rate structure that could maintain the
distribution system over time. However, the degraded water distribution system did not get that way after the city fell into receivership in 2011 when the state took over its fiscal management. People naturally forget about what they can’t see, and spending public funds where the outcome shows no visible improvement can be a hard sell in any organization. System maintenance and its accompanying budgetary burden has been undersold throughout America, and Flint was no exception.

Flint’s bad drinking water also occurred because someone allowed the treated water chemistry to contribute to the breakdown of the water distribution system environment. Much of this discussion is likewise misrepresented by the media.

Those of us in the business know that the chemicals used in water treatment do not “make” the drinking water more corrosive. Likewise the drinking water whose source is the Flint River is not more corrosive than drinking water taken whose source is Lake Huron, unless it is not properly treated. When a drinking water treatment plant is between the raw water source and the consumers’ tap, the corrosivity of the raw water source is, for all practical purposes, an irrelevant factor. The treatment system is always designed to handle the source water challenges and provide a product that meets safe drinking water quality standards. Yes, it’s the water treatment plant operators who have to experiment with process changes for months after a treatment plant starts-up to optimize the treatment train and work the bugs out, but the engineering design team is just as vested in that start-up process and just as concerned about a successful outcome. So why then is Flint’s source water brought up so often? Why do journalists tell us everyday that the water in the Flint River is too corrosive on water pipes? I contend that we can help them get the story right.

A recent series of articles cite the high concentration of chloride in the raw water as one of the reasons the drinking water is corrosive and leaching lead into the tap water. A recent series of articles cite the high concentration of chloride in the raw water as one of the reasons the drinking water is corrosive and leaching lead into the tap water.

true the chloride concentration found in the Flint River is high; a rising problem in surface waters throughout the country due in substantial part to the runoff from road-salt; the raw water is not what is flowing through the city’s mains. The raw water pumped from the river into the treatment plant is less stable in metal pipes than the wholesale treated water that had been purchased from Detroit for decades. But raw Flint River water is not flowing through the pipes. Significant investigative work by the Flint Water Advisory Task Force and cited in its Final Report attempted to answer the question of how the effluent water treated by the Flint water treatment plant was less stable in metal pipes than the wholesale treated water that had been purchased from Detroit for decades. But raw Flint River water is not flowing through the pipes. Significant investigative work by the Flint Water Advisory Task Force and cited in its Final Report attempted to answer the question of how the effluent water treated by the Flint water treatment plant was allowed to be more corrosive that the previous water supply. In any public water system, long-term use of a water supply treated in a consistent and chemically stable manner creates an environmental equilibrium throughout the whole delivery system. When done properly it creates an environment within the water mains that achieves a stability which protects metallic pipes from internal corrosion. In Flint, the finished water purchased for years from the Detroit Water and Sewerage Department was treated and disinfected with chloramines, the pH of the plant effluent water was 7.9, it averaged 7.4 to 7.5 by the time it made out into the reaches of the distribution system, and that treated water was stabilized with a variant of orthophosphate — which slowly deposits a thin protective film on the pipes over many years.

As we know in the public water profession, it is that protective film at the microscopic level which separates the water from the pipe wall. After years of this water flowing through Flint’s pipes at a relatively stable seasonal temperature, stable pH, stable concentration of orthophosphate, and consistent chloramine disinfection dosage, Flint’s water system arrived at a very comfortable environmental equilibrium in which the water passing through the pipes no longer reacted with pipes that contain lead.
"If you suddenly found yourself in charge of the operations staff at Flint, would you have the confidence in your own training and experience to question such advice?"

To meet the new deadline of April 17, 2014, the City of Flint hired Lockwood, Andrews, and Newnam Engineering (LAN) to upgrade the city’s water treatment plant to meet safe drinking water quality standards. This firm had engineered the past treatment plant upgrade and was assumed to know the most about it. As discussed earlier, Detroit cutting them off early forced the city to either abandon their new KWA water supply plan all-together at much higher cost, or accelerate the water treatment plant improvements and upgrade the plant immediately. Instead of having three years to bid, design, construct, and shake-down the new water treatment systems before switching over to the KWA water supply, they had less than a year to be ready to treat the more challenging Flint River with no time to waste. According to the recently released Final Report from the Flint Water Advisory Task Force, LAN was selected as a sole-sourced engineering consultant for the project due to the urgent time-line. The finished design was a lime-softening plant with granular-activated carbon filtration. The Michigan Department of Environmental Quality (MDEQ) participated in the design, granted two permit modifications allowing the plant to operate full-time, and approved the plans and specifications, just as the Department of Health does in Minnesota. We would normally conclude the plant as it was redesigned was capable of effectively treating the raw water, otherwise it should not have passed the MDEQ engineering plan review process.

From available City of Flint online monthly treatment plant reports, the effluent water pH was typically in the range of 7.6, but there were no records showing the dosage of any type of orthophosphate or polyphosphate. The complexity of the water treatment plant earned Michigan’s highest license requirement, so the person in direct responsible charge had to have held Michigan’s equivalent of our Class A water license. Judging from those I know in this profession for the last 19 years, a Class-A operator would be very, very uncomfortable sending water into a very old distribution system without stabilization. And as we’ve learned, within a very short time of switching water supplies, rusty water complaints began pouring in from all over town.

Further research of investigative reports indicates that the MDEQ decided that chemical stabilization would not be necessary during the first year of operation, and until two, consecutive 6-month sampling periods were completed and evaluated, phosphates would not be incorporated in the treatment process. This is very curious, especially when rusty water complaints began so soon after the switch-over. Water treatment plant personnel knew their former wholesale water had phosphates, and asked MDEQ if they should do likewise, but MDEQ’s decision remained firm. One of the treatment plant operators emailed MDEQ virtually on the eve of the switch-over, stating that he was not supportive of sending the plant effluent into the distribution system, and requested further operational guidance before doing so. Allegations exist and have been distributed widely by the media that chemical stabilization was intentionally omitted as a cost saving measure, but the Final Report attributed the decision to a lack of understanding and a misapplication of the Lead and Copper Rule (LCR) by the Office of Drinking Water and Municipal Assistance (ODWMA) within MDEQ, and a failure to comply with the LCR requirements by the Flint public works staff. Safe Drinking Water Act compliance is the obligation of the public water supplier in every state, and the ultimate responsibility to maintain public health from the tap lies with the system operators.

What would our treatment plant operators do if advised similarly by our state drinking water office? If you suddenly found yourself in charge of the operations staff at Flint, would you have the confidence in your own training and experience to question such advice or would you have the conviction to stop the water from being distributed if felt it was not safe? I am not suggesting the Flint operators did not do that, but we should be asking ourselves if our qualifications are indeed adequate for the responsibilities of our profession.

We pride ourselves in this profession for being ongoing students of our science and masters of our craft. By virtue of the training and examination requirements to earn a water operators certification in Minnesota, a Class-B or a Class-A water system operator knows the water chemistry concepts of lime softening, corrosivity, stabilization, disinfection by-products and hopefully through his years of experience understands what the treated water has to be like to not “tear-up” a stable drinking water environment. The years of direct, applicable operations experience required before becoming eligible to take the water operators exams, are purposefully in regulation to give us the opportunity to gain the necessary experience to run such a plant. Did Flint have qualified, licensed operators at the helm? According to an FAQ document published by Flint, they had one F-1 (same as Class-A) operator at the plant who would be responsible for making sure the water chemistry was properly managed. No mention is made of other operators who may have had licenses, but the Final Report tells us that Flint Utilities personnel relied extensively on advice from the ODWMA to help work through water quality issues because the staff did not have the knowledge or the expertise to manage the complexities...
of the treatment process, and became overwhelmed. The report also suggests that water treatment plant operators were hired too late to allow them to have sufficient training, a problem undoubtedly exacerbated by the accelerated timeline to get the system operational by April, 2014.

Could any of us find ourselves in direct responsible charge of a plant that we are not technically qualified to manage? Could any of us be asked to monitor our system health and not know what to do? This real-life case study serves as a reminder that we in the water utility industry must do our part to ensure water operator license holders are qualified through appropriate experience, practice, and current continuing education to make such process decisions. And to those who are striving for your next higher license, wouldn’t it be wise to seek out those jobs where you will get that increasingly responsible experience and thus prepare yourself for a time in the future when your license carries the weight of your city’s health?

A lot of concern is gathering nationwide from the fact that Flint has nearly 50 percent of its 32,000 service connections made of lead pipe, and that many other large cities have similar numbers. I also read on a blog and heard a radio program discuss the apparent protocol for Flint’s lead and copper sample collection, suggesting it was being “rigged” in favor of the tap water are very good examples of what happens when stories are written without our partnership and support.

The drama in Flint is growing each day. I encourage each of you to pay attention to the details of this ethical case study, and look for opportunities in your own community to partner in a positive and truthful relationship with the media to build trust among your public. Spend time during quiet times to help craft good news stories about your public services. Build that trusting partnership now so you won’t be thought of as a government official who is hiding the ball when something controversial happens. When bad things happen, the story will always be published. You can’t stop it. You might as well join the effort and make sure the facts at least get a voice. Otherwise, emotion and opinion will steer the story, and you can see what the outcome is like when that happens.

Rick Wahlen has been a member of AWWA since 1997. He manages a municipal water, wastewater, and stormwater utility in Minnesota. He holds a Class-A Minnesota Water Operators Certification and a Class-IV South Dakota Water Treatment Operators License.

References
City of Flint, Water System Questions and Answers
Final Report, Flint Water Advisory Task Force, Commissioned by the Office of Governor Rick Snyder, State of Michigan
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Austin received his BS in Civil and Environmental Engineering (2007) and his Master’s of Landscape Architecture (2010) from Mississippi State University. During his graduate studies, Austin served as a research assistant in the Department of Landscape Architecture, where much of his research focused on sustainable stormwater management.

After graduating, Austin began his professional career with Waggoner Engineering in Jackson, MS where he serves as a Project Engineer in the Water Resources Division. Austin assists clients in implementing a variety of water-related projects, including water supply, wastewater collection and treatment, and stormwater management.

Austin resides in Madison with his wife (Lydia) and 11-month old son (Garner). Outside of work Austin enjoys traveling and spending time outdoors.

Jaquice received her Bachelors of Science in Environmental Sciences (2007) from Auburn University (Warrr Eagle!) and her Masters of Science in Environmental Sciences (2009) from Troy University. Jaquice is currently pursuing her Doctorate of Philosophy in Civil and Environmental Engineering from the University of Alabama at Birmingham. She presently works as an environmental engineer for The Birmingham Water Works Board, the largest water utility in Alabama. Jaquice’s duties include researching and implementing methods to optimize water treatment plants operating efficiency and productivity. This is done with a state of the art mobile pilot lab that mimics the full-scale water treatment plants. With this mobile lab, the testing of new chemicals and equipment is done for possible implementation into the full-scale water treatment processes. Jaquice also oversees the environmental aspect of various utility projects.

Jaquice resides in McCalla, AL with her husband (Brandon) and 4-month old daughter (Alexandria). She loves the outdoors and is an avid deer hunter.
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<td>Jim House &amp; Associates Inc.</td>
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<td>205-987-7411</td>
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<td>Neel-Schaffer, Inc.</td>
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<td>800-264-6335</td>
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<td>Neptune Technology Group Inc.</td>
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<td>334-283-6555</td>
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<td>Pittsburg Tank &amp; Tower Company Inc.</td>
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<td>800-455-3293</td>
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<td>Utility Service Co., Inc.</td>
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<td>Volkert, Inc.</td>
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<td>251-342-1070</td>
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<td>Waggoner Engineering, Inc.</td>
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<td>800-661-3733</td>
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<td>Williams Equipment &amp; Supply</td>
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