



American Water Works Association
Pacific Northwest Section

SPRING 2021

WATER *matters*

The Official Magazine of the
Pacific Northwest Section – AWWA

Spring INTO FLOOD RESILIENCE

- ▶ **Gray Matters**
- ▶ **How COVID-19 Can Communicate the Value of Water**
- ▶ **Spring into Flood Resilience**

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Message from the Chair • PNWS Association Director Report



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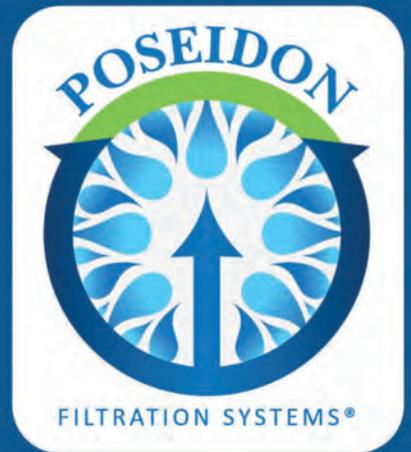


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Message from the Chair



Grateful for You and this Section

Just what past Chairs before me had predicted: my year as Chair has flown by. For me personally, it was one of the most challenging years within my family. The number of personal tragedies that hit our family were more than anyone could have ever expected. Coupled with the constraints that COVID put on us, I am shocked that we are all still smiling. I know that I am not alone: I have talked to many of you and know that you've had your share of challenges, too. For all of us, strength and perseverance have been key.

Since this is my last message as Chair, I decided to take a retrospective look at my opening speech and see what I accomplished in the year. My goals were:

- *I would like us to embrace the mission of the Associations Diversity and Member Inclusion Committee. Their mission is creating a diverse membership and establishing an organizational environment that recognizes, encourages, celebrates, and effectively utilizes each individual member's talents.*
 - o *To do this, I would like to call for a Subcommittee under our Membership Committee to implement our Section's vision by utilizing and optimizing the talents, experiences and passions of our members.*
- *I will be calling for an ad-hoc committee to take a look at our current bylaws to make sure that we are aligning our Section with the affiliation agreement that we have with the Association. I would ask that they also look at our current processes to ensure that we are reflecting current practices of the Association. Finally, I would like this ad-hoc to make sure that through any*

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bylaw changes that we are still serving our membership properly.

- My final goal is to have our Finance Committee focus on not only this year's remaining budget but look ahead to future budgets. The cancelation of our 2020 conference has certainly impacted our finances and goals for the coming year but it will also impact future boards and their budgets. I will be challenging the Finance Committee to bring forth a conservative budget that will protect our Section's fiduciary responsibility to our membership not only now but for the future.

Well, I can honestly say that we did well considering everything that was stacked against us with COVID, social and political unrest, and the constant stresses of dealing with all of this. I am so proud of the strides our Section has made with our new Subcommittee, devoted to Diversity and Member Inclusion. The group is just getting started and I look forward to seeing the positive impact this will have in our Section.

One of the most challenging tasks we took on was updating our bylaws. The ad-hoc was originally

recommended by James Dean, during his last quarter as Chair, and the work this group did was amazing. When they were finished, the Board worked so well together, listening to the membership feedback, and ended up with bylaws that reflect our diverse membership and ensure that from the top down, future Boards are inclusive, not exclusive. The Association has approved our bylaws and our next step will be sending them out to a vote for approval by our membership. Our work is not done yet though: we still need to update our rules of procedure to reflect the changes to our bylaws. That work will happen under our incoming Chair John Roth.

I feel that we also did well on my last objective regarding the Finance Committee. The Committee acted quickly and adapted our budget to protect the Section in 2020 and created a balanced budget for 2021. During a time where we planned for the worst and prayed for the best, we ended up pleasantly surprised. At first glance, we projected that we would have to rebuild our reserves into 2022 and beyond; however, thanks to our committees and

our Executive Director's negotiation skills, we are close to erasing this shortfall in just a few short months. If all goes well with our new four virtual conferences in 2021, we should finish the year even, if not ahead.

At the end of the day I can still say, and with even more enthusiasm, that I am so proud to be a part of the Pacific Northwest Section of AWWA. Thank you all for voting for me to be your Chair. Your belief in me has helped carry me through this year. Many of you have reached out to me to check in and give me your feedback; I appreciate each and every one of you for that.

Thank you to my employer, Spanaway Water Company, for allowing me to serve. Without their support, I could not have done any of this. With that being said, I will sign out on my year as Chair and give a warm welcome to John Roth. I know that great things are ahead of him. As always, I say to you all: stay healthy, wash your hands and please be good to people!

Ronda Farmer
PNWS Board Chair 

Year Round Water Quality

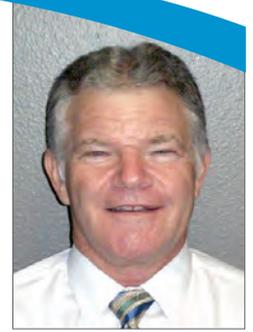
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Focus for the Future

As we move further into 2021, I am sure all of us would agree we are happy to see 2020 in the rearview mirror. Never before have utilities and staff been confronted with so many challenges, dealing with COVID-19, than over this past year. With this crisis being thrust upon our communities, our nation, and the world, utilities came together to help each other – providing support, equipment, continuity plans, etc. – and make sure every utility had what they needed to address the changing environment brought by COVID. It has been remarkable to see how utilities have rallied to overcome the challenges, stay diligent, ensure the protection of staff, and carry out our collective mission: to deliver safe, reliable drinking water to our customers.

Even in the face of all the challenges, we can all agree there are some takeaways that will continue to have impact on the positive side of things. Who would have ever thought we would be using remote access and working from home without customers ever noticing a difference? It is safe to say this will be utilized further as it builds into more opportunities for the flexibility of staff and utilities alike.

The advancement of SCADA technology and employing automation adds a new way that utilities can manage and operate treatment plants, water sources, pumping, pressure zones, and storage without having to come into the office. Virtual meetings, training, and education have never been utilized like they are today. These are just a few examples of things I believe are here to stay.

In the coming months, we look forward to conquering this virus and slowly returning to the opportunities where we can see each other in person once again, as nothing replaces an in-person experience – especially as it relates to the value of sharing information and networking opportunities this industry has to offer.

As you might have expected, the AWWA continues to advance and develop new opportunities for virtual uses to meet the needs of its members – now and in the future. Since the early days of the pandemic, the AWWA has proven to be a leader in adapting to the challenges of COVID by providing virtual training, education, and resources. We are probably now reaching people we previously have not been able to. The COVID issue has taught us we are not limited to in-person conferences but also can reach people virtually or remotely; however, as the Association looks toward the future, there is no question the Board of Directors will be presented with challenges – including the financial well-being of AWWA, providing guidance and



strengthening connections to the 43 Sections.

The Association's Winter Meeting was held virtually on January 26; the following information is important to share with you.

First, let's talk about the financial health of the AWWA. The Association was forced to face and responded to unfamiliar challenges – quickly adjusting to an all-virtual work and member value approach. In 2020, while revenues were down by \$11.0 million, the Association was able to cut expenses by \$7.0 million, thanks in part to insurance coverages paying 75% of the canceled in-person events and receiving a Payroll Protection Program – finishing 2020 at a \$3.6 million loss for the year. Over the next three years, it is anticipated the years of 2021 and 2022 will finish in the red but with lower losses than 2020. The 2023 forecast, however, has the Association operating back in the black financially.

Bottom line, AWWA remained financially strong, minimized possible financial losses, and protected cash reserves. While AWWA is financially strong, it is not invincible. AWWA has a healthy reserve, but it is not infinite. The Association needs to preserve the reserve and make all financial decisions carefully and cautiously.

The AWWA annual ACE Conference, scheduled for June 13-16 in San Diego, is currently being approached as

both an in-person and virtual conference. Should there still be barriers prohibiting the in-person side of the conference, the decision to drop that side of the conference would be made at the end of March. Options are currently being considered for an all-virtual meeting should that happen.

Next let's talk about membership. At the beginning of 2020, AWWA membership was at 52,198; at the end of 2020, membership is at 49,484 with 40 out of 43 Sections seeing a decrease in membership. *The Association is requesting, "Each member get a member!" and each Section focuses on investing and increasing membership for 2021. AWWA has set a goal of getting membership to over 50K by the end of 2021.*

The 2021 Business Focus will be in seven areas:

- 1) **Business Plan Objectives for 2021** will only be concentrating on about half as many actions as in 2020, simply focusing in on the most important things the Association does instead of every single thing. AWWA will continue on the routine things but focus on the areas not reflected in the business plan.
- 2) **Virtual** – Virtual everything: summits, webinars, DC Fly-in, ACE21-hybrid offering in-person and virtual. Grant workshops continue. Envoi is a web-based service for accessing AWWA technical content. Envoi will add content and be available to utilities and service providers. The Association continues to grow and enhance the virtual experience for members by providing a plethora of resources and benefits.
- 3) **Enterprise Model** – The Enterprise Model provides, as part of a utility member benefit, an unlimited number of memberships for employees of the utility. The member benefit package may be altered, and the price point for the membership may increase. AWWA has piloted this model in one Section very successfully. Wide-spread implementation would require, among other things, adoption in all Sections. More work by the Committee is needed and additional time has been requested to comprehensively examine the pros and cons in order to make a final report and recommendation to the Board at ACE.
- 4) **Program Review** – Program reviews are continually evaluating the Association's programs for relevance, value, and investment in the future. Please attend Key Section Leadership Training in Q3 2021.
- 5) **AWWAIndia** – AWW India will continue its business specifically in webinar/training in the next years, spending more time in exploring partnerships with other

organizations such as American Society of Civil Engineers. AWWAIndia will continue the membership engagement through its website and *Opflow India*, set to become a quarterly issue aligning with the webinar/training theme in the future. Meanwhile, AWWAIndia is investigating meeting and webinar registration procedures in India.

- 6) **Strengthen Public Trust** – There will be a strong focus on increasing the public's trust in their tap water.
- 7) **Lead and Copper Rule and PFAS** – LCR, PFAS, and Cyber Security will be among the areas of concentration in 2021. AWWA is pursuing legal action to intervene in petitions filed in response to the U.S. EPA's Final Lead and Copper Rule Revisions under the Safe Drinking Water Act.

Committee Objective: To review, study, consider, and evaluate the insights, perspectives and information from utility members and stakeholders in order to provide a recommendation for the best manner in which to adopt an enterprise model.

Benefits: Advance the mission, satisfy market demand, improve the member experience, increase awareness of AWWA and usage of Association and Section products and services, reduce confusion.

Concerns: Loss of revenue, cost of benefit delivery to a wider audience, pricing, operational implications and impacts, Section capacity.

Elections were held for President-Elect, four Vice President positions, and one Director-at-Large. The results are President-Elect – **Joe Jacangelo**; Director-at-Large – **Ari Copeland**, Florida Section; and the four Vice Presidents are **Angela Ballard Landers**, Chesapeake Section; **Heather Collins**, Cal/Nevada Section; **Cheryl Porter**, Michigan Section; and **Randy Black**, Pacific Northwest Section.

I am looking forward to representing the Pacific Northwest Section as a Vice-President. Hopefully, I will get the opportunity to attend in-person conferences as gathering restrictions relax in the fall. If so, I look forward to a more personal opportunity to talk with members to share thoughts and suggestions that could be beneficial to our Section.

If you have any questions or would like further information on any of the items I am reporting on as your Association Director, you can contact me directly at rblack@lakewoodwater.org. 

Randy Black
PNWS-AWWA Director



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Utility Management Committee

Over 100 women have registered for the *Women in Leadership* virtual networking event (and more continue to come in). We look forward to inspiration and break-out sessions where we can learn and share about maintaining connections and thriving through change. Many are ordering wine from Warr-King. Lisa Warr-King Packer, the owner and winemaker will

be hosting a virtual wine tasting during the event. Chocolates from Wellington Chocolates (another woman-owned business) will be included with the wine. We will provide a summary in the following issue.

All managers, supervisors and future leaders are welcome to join the ongoing conversations on the third Thursday of each month at

9:00 a.m. via Google Meet. Recent discussions have included asset management (especially for smaller systems), staff development and succession planning. Come network and share what you are working on. Contact kreid@pnws-awwa.org for more information or visit the Committee page on the PNWS-AWWA website. 

Public Information Committee

The 2021 Excellence in Communication Awards is coming soon. This year, the entries will be submitted electronically and a COVID-19 category will be added. Start thinking of examples from your best public information/communications work, throughout the year of 2020, for the entry process. The Public

Information Committee is also looking for volunteer judges who have a few hours to serve later this Spring. The awards will be presented in a *Virtual Celebration* event.

Going forward, the focus of the Public Information Committee will be to engage members and deliver the support you need.

We'd love to hear your ideas. Please contact any current officer with your thoughts on what you would like to see from the Committee or if you are interested in volunteering. Contact information is available at www.sites.google.com/a/pnws-awwa.org/public-information. 

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Young Professionals Committee

The Pacific Northwest Section (PNWS) Young Professionals (YPs) are a subgroup of the American Water Works Association (AWWA), consisting of a dedicated cohort of young professionals and students. The YP Committee coordinates and hosts events that provide powerful leadership skills and technical information to enhance your career and opportunities to network with water industry professionals.

In the Works

The YP Committee continues to innovate new ways to provide virtual networking and training opportunities. Our Events Coordinator Alex Puryear (Xylem Digital Solutions) is working hard to organize a series of interactive webinars and social events for YPs. Our new Student Chapter Coordinator

Christopher Jones (Brown and Caldwell) is working closely with local universities to establish strong student AWWA organizations.

PNWS YP Events

Virtual Event Series

The YP Committee is hosting a Virtual Event Series for all PNWS YP Subsections to network and receive technical training opportunities during the pandemic. To date, two webinars have been hosted: *Black Water Coming Out of Your Tap?* and *Wildfire Effects Source Water Quality and Treatment Strategies*. Both were well attended and included a lively Q&A session, which stimulated great conversation following the presentation. To learn more about the Virtual Event Series, visit www.sites.google.com/a/pnws-awwa.org/young-professionals.

Joint AWWA/ASCE Career Panel Event

Our YP Committee is partnering with the Younger Member Forum (YMF) of the American Society of Civil Engineers to host a Career Panel Event for students and graduates looking for employment or an internship. The event will be about three hours long and feature panelists from different fields of civil and environmental engineering. During the event, attendees will have the opportunity to network and attend various field-focused discussions, facilitated by each panelist. The Career Panel Event will be held virtually on March 31, 2021 and will be open to all students and recent graduates.

PNWS Student Outreach, Career Fairs, and Mentorship

Are you planning a career fair event or student outreach campaign or interested in connecting with other industry professionals through the PNWS Mentorship Program? Visit the MEDC and YP Committee website for details: www.sites.google.com/a/pnws-awwa.org/membership_committee.

Participate and Stay Connected

Connect with our Communications Coordinator Annabel Warnell at awarnell@landauinc.com to learn more and get involved with the Young Professionals Committee. We look forward to working with you. 🤝

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Grateful for My Career in the Water Industry

Denny Clouse here. I'm writing this article and looking back through my whole career because – after over 40 years in the Pacific Northwest's water industry – I will be retiring; November 19, 2021, will be my last day! Throughout my journey, I have met the most fantastic folks and now have life-long friends from within the Pacific Northwest Section and throughout the world.

It all started back in 1981, in Oregon, when I applied for a position at the Medford Water Commission. This position was called a 'Service Man I.' It was an entry-level position and I was so excited to work for a utility that had all the tools and materials. I also received things called benefits – health care and retirement – and learned so much about underground work.

In the mid-1980s, the management team at the Medford Water Commission sent employees to training and 'Short Schools' to give us the industry knowledge needed to pass the Water Distribution exams. This was another huge benefit for a guy that did not go to college.

In 1996, I was taken to a Pacific Northwest Section Fall Trustees meeting by my manager at the time, Ed Olson. Going to that meeting, I found that I could meet people like me, who just wanted to make a difference in this profession. I met managers, superintendents, operators, consultants, vendors, young professionals, PNWS staff and so many others that made me feel so welcome to be a part of this thing called the Pacific Northwest Section of the American Water Works Association.

As time went on, I was elected as the Oregon/Idaho Trustee in 2002. It was such a great honor to be a Section trustee; today, I still look at the Section officers with great respect. With my whole heart, I cherish the opportunity to meet so many great people along my journey.

In 2006, I became Section Chair. *(What? That can't be – the little guy from the Medford Water Commission – Chair of the most prestigious section in*

Throughout my journey, I have met the most fantastic folks and now have life-long friends from within the Pacific Northwest Section and throughout the world.

the American Water Works Association!) Yes, that was an exciting year. We were all donating money to Water For People with Golf Tournaments hosted in all three states, raising money for the E&T Fund. This Section has so many volunteers that do so much.

My employment also changed that year: I went from being the Operations Superintendent of the Medford Water Commission to accepting the position of Operations Manager at the Shoreline Water District, which is now the North City Water District. Like at the Medford Water Commission, the North City Water District has fantastic commissioners, managers, and employees and I thank them all for my career.

There have been some great highlights in my life. I have my best

friend as my wife, I have two of the most beautiful daughters in the world, a son-in-law that is just awesome, and two grandchildren that melt my heart. In my professional life, I was awarded the PNWS *Powell Lindsay Award*, I received the *George Warren Fuller Award*, and the North City Water District named the North City Pump Station after me.

Here I am now: 40 years into my water career and looking forward to spending time with my family in Oregon, California, and Alaska. Cheri and I plan to travel and pursue our hobbies.

I am fortunate to have made the best friends for life. Thank you all! 🙏

Denny Clouse

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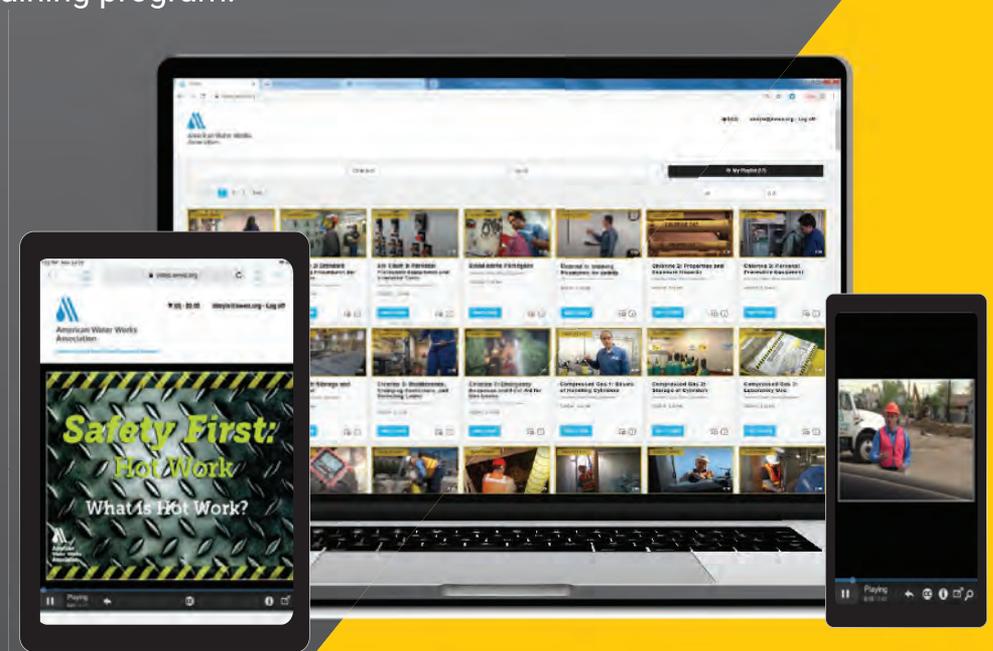
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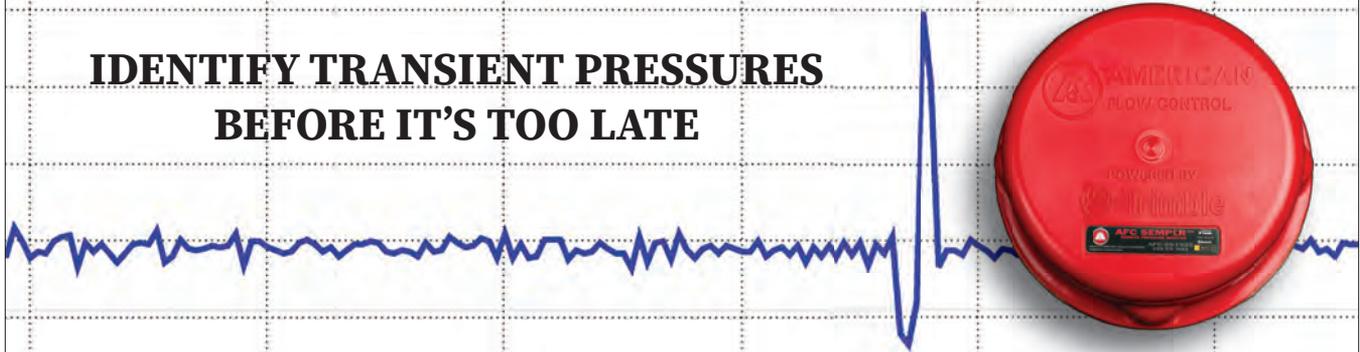
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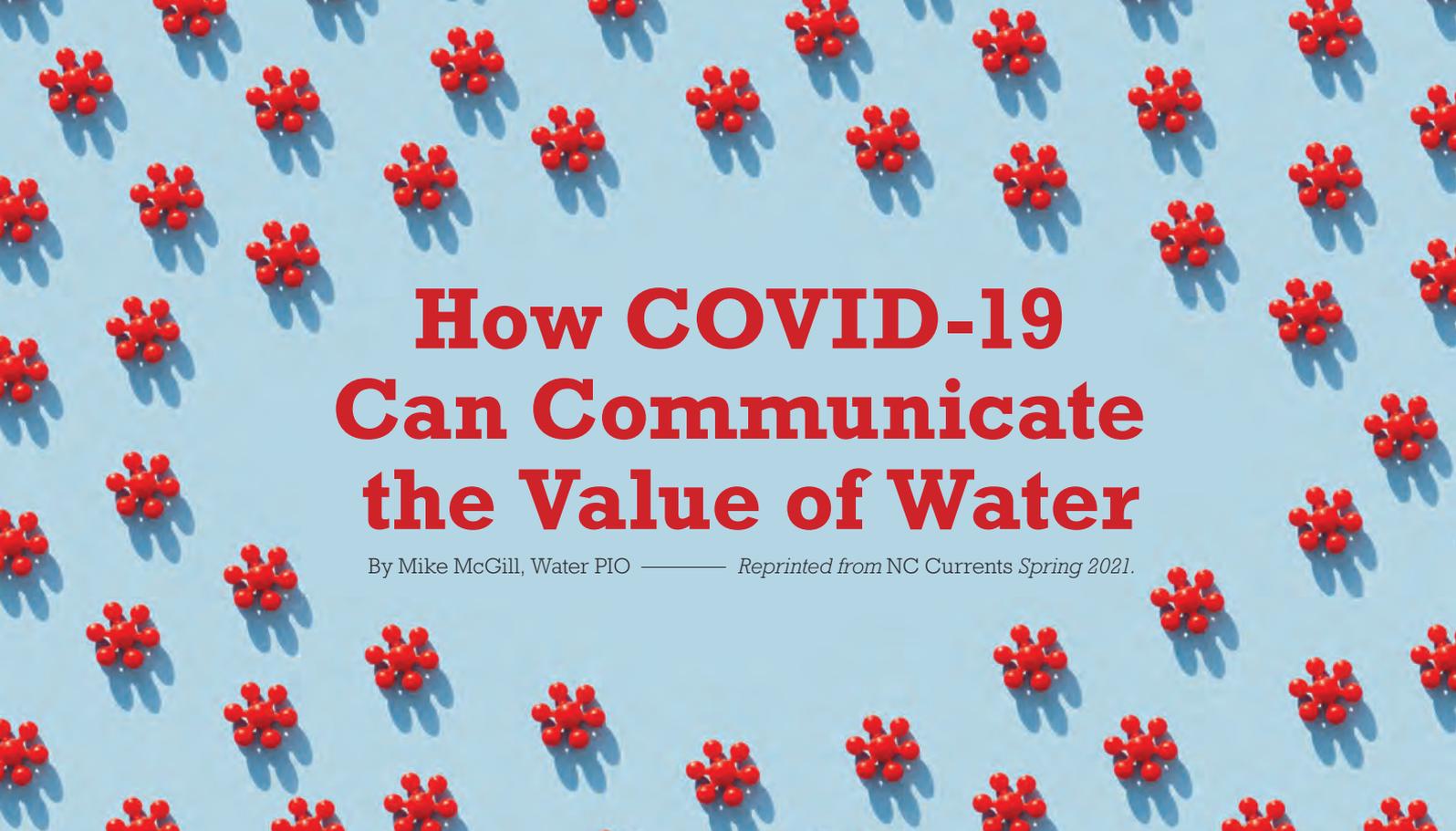
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How COVID-19 Can Communicate the Value of Water

By Mike McGill, Water PIO ——— Reprinted from NC Currents Spring 2021.

“ Let me at least give a little bit of good news. ... There's no evidence that [coronavirus] does affect the drinking supply. It's fine to drink your water like you normally would.

– Dr. Sanjay Gupta, CNN, March 19, 2020.

“ Data from testing the wastewater, it's a little bit like looking into a crystal ball. ... Diagnostically, it's kind of neat to know what's coming. To know who is infected before they know they are infected.

– Rachel Maddow, MSNBC, December 9, 2020.

Communicating the value of water is a concept water and wastewater utilities have struggled with over the years; some of you may have even rolled your eyes when you read the headline.

As essential as we are to our communities, our services are out of sight and out of mind, often only thought of when there's a bad bill or a water main break. As we know, this can lead to a frustrating lack of understanding and appreciation.

I joined the water world back in 2007 as the lead spokesperson for the Washington Suburban Sanitary Commission (WSSC). My first task?

Get the utility through a water main break-filled winter while building support for its services at the same time; major rate increases were lined up for the spring.

WSSC suffered more than 2,000 water main breaks that winter. You would think that made my job impossible. Actually, it made it easier. Here's why.

The crisis enabled us to be “in sight” and “on the mind.” The breaks gave me the opportunity to repeatedly tell everyone how important our water system was to their daily lives, and how it needed investment. I often gave early-morning interviews holding a

piece of broken pipe so old, I said it “could collect social security.” Anchors and reporters loved the line; they repeated it often.

The approach flipped the coverage from the “breaking” news to stories about the importance of keeping our water system reliable. The Washington Post even editorialized in support of our plans to replace our mains and, in time, we won the financial support we needed.

Taking Advantage of Opportunity

I cite this story because it illustrates how an attention-creating crisis can give utilities opportunities to boost their levels of appreciation.

Without question, our work saved our communities from chaos during the COVID-19 pandemic. The stories behind our efforts, if we choose to tell them, increase our ability to gain valuable understanding about what we do and how important we are every single day.

Now, I'm not crassly saying, "Never let a good crisis go to waste," an expression tied to taking advantage of tragedy.

What I am saying is that the public deserves to know how our performance during the crisis assured people their drinking water was safe from the virus. As Dr. Gupta said, our customers could drink their water as they normally would.

As a result, you CAN ask your customers to imagine what life would've been like if COVID had affected our drinking water. They should shudder to think how radically their lives would have worsened.

But that didn't happen.

Because it didn't happen, you CAN tell your customers how your treatment process inactivated the virus, just as it has with other viruses that threaten public health.

You CAN inform your customers about how you protected the quality and quantity of their water by making sure your facilities are always fully – and safely – staffed by dedicated employees working odd shifts.

When it comes to your wastewater services, we know it can be tough to get positive attention for sewer work. However, as Maddow points out, wastewater is not an "ick" story right now; it's actually an "Ah ha!" moment all over the country.

Our treatment and COVID-related testing efforts are protecting the public

in ways we never would have imagined months ago. We're finding evidence of outbreaks before our communities even know they have them.

Getting the Story Out

So how do you inform the public, especially if we've been out of sight and out of mind?

As you can tell from my WSSC tale, working with the media is essential. I'm a former television news producer, so I can say to you with certainty that developing and implementing a communications plan will go a long way toward gaining greater appreciation of your utility.

Don't worry, the plan is not complicated; it's not 50 pages long, destined to collect dust on a shelf. It simply lays out the messages you want to use, who to use them with, and how to successfully get the public to see, read, or hear them.

As part of the plan, you should consider sitting down with the press and delivering an update about your COVID-19 efforts. Whether it's one-on-one or with a group, the session highlights the strength of your services and the dedication of your staff. It is not a press conference; it's more like a monthly board meeting where you present information in a controlled manner, followed by fielding questions you've actually helped shape.

Your communications plan will ideally include an op-ed for submission to your local papers. Op-eds give you the ability to place up to seven hundred words of your own choosing that compellingly drills in how your utility came through during the COVID-19 pandemic.

And that message goes straight to the

most active and involved members of your community.

Your customer outreach mirrors the media work. Public information content is crafted so every one of your customers can take in your messages. Bill inserts and brochures connect with older audiences while web content and social media posts connect with younger consumers.

I just slipped in those magic words, social media. It's the number one topic I'm asked about when I speak – well, Zoom right now – to water organizations all over the country.

Almost all of the questions come from an "I hate it!" point of view. The frustration is palpable because even overwhelmingly positive stories are attacked. As a result, many utilities avoid using the medium as much as they possibly can.

Listen, there are going to be the "always angry" people on social media who will scream about anything you do or say. Thing is, they do the most damage if they get you to stop communicating at all.

Angry people on social media actually represent a small sliver of the public. The vast majority of people online are simply individuals who want to be assured, and reassured, that everything is going to be okay.

Your response to COVID-19 is an overwhelmingly positive story that can reassure your customers about the job you are doing. But that can only happen if you're out front, leading the conversation online.

When the "always angry" attack, don't let them take over the conversation. Keep engaging with information, empathy, and availability. Move the difficult person offline by offering a personal discussion. If the person refuses, their credibility is harmed, not yours.

That's even more certain when you're talking about COVID-19. It's difficult for the "always angry" to win the argument when the value of your services is unquestionable.

You have not only protected the public's health with safe drinking water but your wastewater services are helping protect your communities.

That's an impressive combination of positive stories to tell. You just have to do to tell it. 🗣️

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Spring into Flood Resilience

By Gabrielle Minton, U.S. Environmental Protection Agency, minton.gabrielle@epa.gov

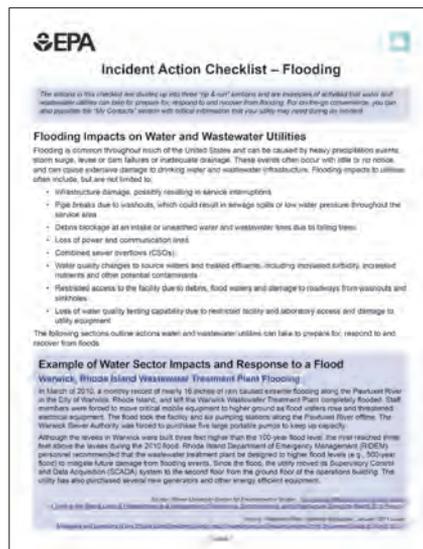
Introduction

The services provided by drinking water and wastewater utilities are vital to the health and resilience of a community. However, extreme spring weather, such as heavy seasonal rainfall that may also be coupled with snowmelt, can trigger flooding that can disrupt drinking water and wastewater services, underscoring the need for long-term resilience solutions in the water sector.

Any drinking water or wastewater utility, large or small, can be at risk of sustaining significant and costly flooding damages. To better prepare for the upcoming spring season, your utility can take steps before, during and after weather emergencies using the U.S. Environmental Protection Agency's (EPA) suite of easy-to-use tools and resources.

Identify Response Actions and Critical Customers

Floods are one of the most common and widespread weather-related natural disasters. They can be caused



by a variety of weather events, including heavy spring rains that may follow a winter of significant snow and ice accumulation.

The EPA has developed the (www.epa.gov/waterutilityresponse/incident-action-checklists-water-utilities) that lists activities utilities can conduct to

prepare for, respond to and recover from flooding emergencies.

The planning measures outlined in the Flooding IAC encourage utilities and community partners to work together before potential incidents to identify priority water customers, obtain their contact information and develop a plan to restore those customers first, in case of prolonged water service disruptions. Further, confirming with local law enforcement before an incident that your water utility response access credentials are valid can make all the difference when staff are urgently needed to restore flood-ravaged facilities.

Prepare for Cascading Impacts: Power Outages

The spring season can bring snow melt, heavy seasonal rains and flash floods. These conditions can overwhelm existing infrastructure and lead to pipe breaks, flooded facilities and widespread power outages. Power loss can have devastating impacts on drinking water and



wastewater utilities and the communities they serve. Inoperable pumps at drinking water utility infrastructures can compromise firefighting operations and cause local health care facilities and restaurants to close.



EPA developed the *Power Resilience Guide for Water and Wastewater Utilities* (www.epa.gov/communitywaterresilience/power-resilience-guide-water-and-wastewater-utilities) to provide information and strategies for strengthening relationships with electric providers and increasing water sector resilience to power outages from floods and other weather emergencies.

The Power Resilience Guide identifies steps your utility can take to establish emergency communication protocols, determine your utility's power prioritization status, and maintain onsite fuel storage, among other recommended actions. The Guide also highlights case studies from water utilities that have successfully implemented power resilience measures.

Transform Preparedness into Mitigation

While preparedness measures can strengthen your utility's resilience to flood-related impacts, putting long-



term mitigation planning for flooding incidents into practice is the most effective way to ensure your utility and community can better withstand and recover from disasters.

To assist planning for long-term mitigation projects, EPA's *Hazard Mitigation Guide for Natural Disasters* (www.epa.gov/waterutilityresponse/hazard-mitigation-natural-disasters-starter-guide-water-and-wastewater) provides examples of mitigation projects for disaster scenarios that drinking water and wastewater utilities may encounter during a flood, such as purchasing or renting a generator to prepare for power outages and elevating wellheads to mitigate the impacts of flooding from spring rains or water runoff. The Guide encourages drinking water and wastewater utilities to work with their local mitigation planners to execute priority projects that are consistent with the overall community strategy.

The Hazard Mitigation for Natural Disasters Guide also includes information on eligibility for funding, such as federal grants or loans, to support mitigation work. This includes the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP) which can be used by communities to implement

hazard mitigation projects following a Presidential Disaster Declaration.

Identify Federal Funding Opportunities for Mitigation

There are several federal programs, including HMGP, to help utilities understand and obtain federal disaster and mitigation funding. EPA developed the Federal Funding for Water and Wastewater Utilities in National Disasters (Fed FUNDS) tool (www.epa.gov/fedfunds/which-funding-right-your-drinking-water-or-wastewater-utility) so that utilities can quickly screen funding programs from U.S. Department of Housing and Urban Development, U.S. Department of Agriculture, Small Business Association, FEMA and EPA to identify those that are applicable to your utility. It also provides examples of successful utility applications and tips for funding.

Consolidate Information in an Emergency Response Plan

Another key aspect in planning for and responding to flood-related incidents is developing a robust Emergency Response Plan (ERP) (www.epa.gov/waterresilience/americas-water-infrastructure-act-risk-assessments-and-emergency-response-plans#ERP). An ERP describes strategies, resources, plans, and procedures to prepare for and respond to an incident, natural or man-made, that threatens life, property, or the environment. Under America's Water Infrastructure of 2018 (AWIA) Section 2013, community water systems serving over 3,300 people are required to develop or update an ERP. The information, plans and procedures developed when utilizing the Flooding IAC, Power Resilience Guide for Water and Wastewater Utilities and Hazard Mitigation Guide for Natural Disasters contribute to the foundation of your ERP. Compiling this information provides a clear and concise process for unexpected emergencies and fosters a culture of preparedness at your utility.

To learn more, visit www.epa.gov/waterresilience or join the What's Going On newsletter email list by contacting wsc-outreach@epa.gov. With the help of EPA's free water resilience resources, you can help ensure that your utility continues to provide safe and reliable services to your customers during emergencies. 



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Today's Context: Communicating in an Era of Distrust

By American Water Works Association

While most utilities provide water and wastewater services that meet all standards, and even a short disruption of service is a rare event, utilities are seeing heightened anxieties about water quality and environmental concerns bubbling up from those they serve.

Media coverage of the Flint, MI, water crisis and the daily reports questioning water quality have had an impact. [According to a 2016 Kaiser Family Foundation poll, Americans ranked contaminated drinking water third – just behind heroin abuse and cancer – as the biggest risk to public health.](#) Most Americans report their trust in local government is much higher than their trust in state and

federal governments; however, civility itself has become a concern, even for local jurisdictions.

Consumers are paying attention and increasingly seeking out information about the safety and quality of their water. Ideally, they receive information from you, and you are their trusted sources for water information. [However, if you are not communicating, they may turn to Google for information or a Facebook friend may provide a link to a company promoting a product.](#) [If this happens, these sources can become your customers' trusted source for water information.](#) Social media sources may provide information that is incorrect,

incomplete or without context.

Investing in communication programs designed to build trust with consumers is an excellent way to insert yourself into a landscape crowded with self-proclaimed experts.

The Silent Service Provider

Many utilities have favored a reactive approach to communication focused on maintaining good, reliable water and wastewater service and answering customer questions as they arise. In fact, The Water Research Foundation has found that nearly half of all water utilities have no communication plan and no staff dedicated to communications and community outreach work.





The Rise of Social Media

The explosion of social media over the past decade has changed how we communicate, but water utilities have been slow adopters of these new communication channels. Social media provides a platform for consumers to engage and connect on a global scale. They can share information, raise awareness and rally support for issues they care about and reach beyond friends and family to hundreds or thousands of users on numerous social media platforms. This communication channel feeds the public's increasing expectation for engagement and information about decisions that affect them.

Indeed, social media has empowered the consumer. If leveraged correctly, social media can build support for and provide understanding of public interest issues like drinking water and wastewater treatment. **If ignored or used to spread misinformation, the result can cause devastating impacts for a water utility.** Inadequate, inaccurate, and malicious information can cause reputational damage, a loss of support for a project, or worse, widespread panic.

For many utilities, communicating on social media is daunting. Few small- and medium-sized utilities

have the resources required to maintain and manage a robust social media program. Even large utilities with professional public relations staff must dedicate resources to ensure two-way communication happens in real time. Some utilities have activity on platforms like Facebook, YouTube and Twitter and balance that limited engagement with anecdotal reporting from employees who come across comments on their personal social media accounts. This can leave utility leaders informed about a conversation but with no opportunity to engage in or impact it.

Social Media's Influence



Facebook is the most widely-used social media platform among customers, and 74% of users visit at least once per day. (Source: Pew Research Center)



Twitter has emerged as a primary source for the news media. (Source: *The Washington Post*)



Nextdoor is available in more than 90% of neighborhoods across the United States and is a popular platform for local community conversations. (Source: *The Atlantic*)

- Advocacy organizations use a variety of social media platforms, but Facebook and Twitter dominate (Source: *HuffPost*).



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Advocacy and Misinformation Campaigns

In today's media environment, utilities are competing for attention with accomplished advocacy voices that have leveraged social media and used water utilities' past silence to establish themselves as influencers on water issues. Many of these voices are helpful in raising awareness of important issues and have a genuine interest in improving water quality and protecting the environment. However, some of these influencers have an economic interest in capitalizing on the public's growing concern about water quality to sell various products

and services. Others are political advocates aiming to build a policy platform to recruit new supporters or dues-paying members.

Many influencers use fear-based messaging as a highly effective tactic for establishing themselves as a credible voice to consumers. They then advance their position or product as a solution to the perceived "fearful" problem and recruit supporters for their own political or economic gain. **Scaring consumers and increasing skepticism around utility services is relatable and engaging to consumers and hard to refute with the fact-based, infrequent**

communication methods currently used by many water utilities.

As a result, during a water quality event, other interested parties are successful in using their more established platforms and wide-ranging social media networks to drown out the often-quiet voice of the water utility. They can play off the fears of consumers to create sweeping misinformation campaigns that benefit their interests.

To combat this type of misinformation campaign, water service providers need to understand the motivations behind these interests and engage and reassure consumers through proactive risk communication.

“ Scaring consumers and increasing skepticism around utility services is relatable and engaging to consumers and hard to refute with the fact-based, infrequent communication methods currently used by many water utilities. ”



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Risk Communication Strategies Can Help

In 2002, Daniel Kahneman and Vernon Smith won the Nobel Prize in Economics for research demonstrating that when fear is present, people process information differently, and the science of risk communication was born. This research showed that when people are emotional, they shift their brains' information processing to the primitive amygdala. The only decision under consideration in the amygdala is how to be safe: should I flee, freeze, or fight? When you are

speaking with someone – in person or through social media – who is angry or emotional, it is critical to remember that they are processing everything as a fight response necessary to keep them safe. Risk communication best practices are designed to help people feel safe enough to return to reasoned discourse where broader information and considerations beyond immediate safety can be applied to decisions.

The ability to connect with audiences who are angry or emotional is an increasingly valuable leadership skill for utility professionals. Utilities can

significantly diminish the consequences of the spotlight by applying risk communication best practices both proactively and during a crisis.

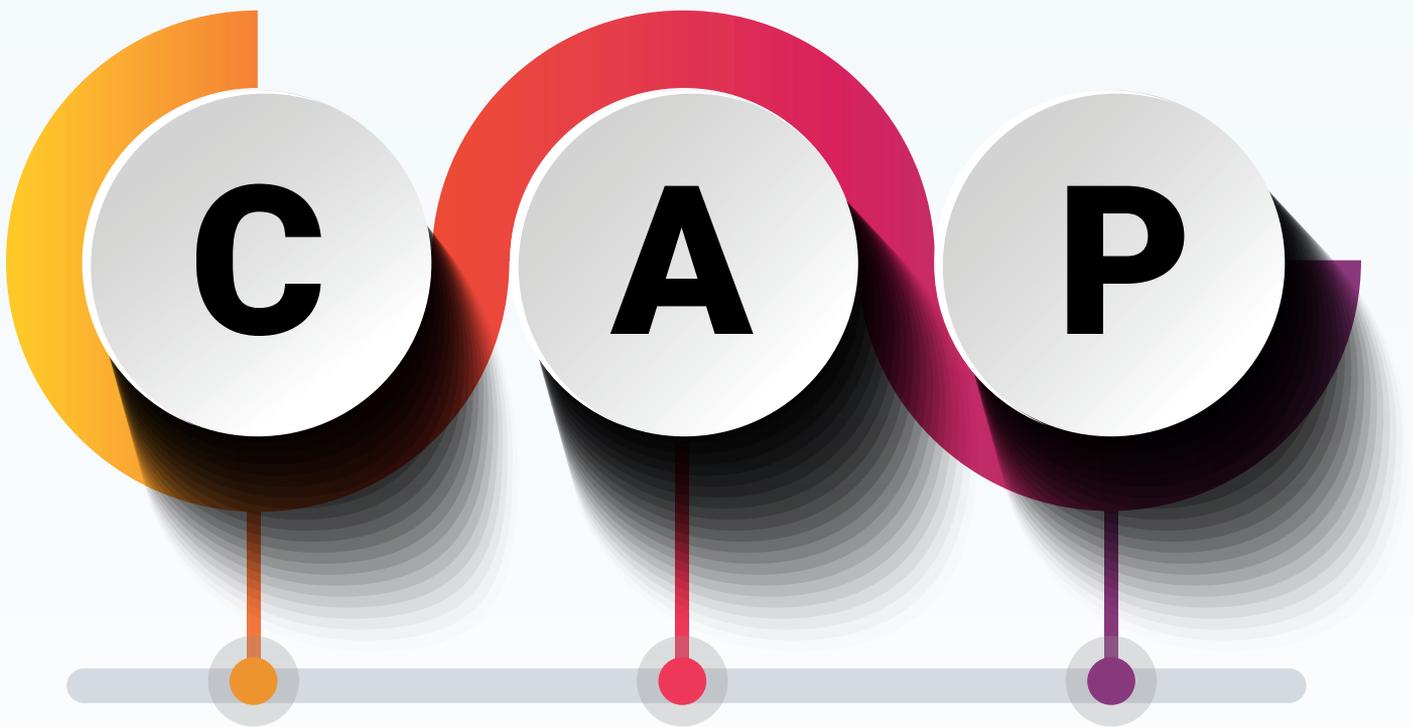
Science has found that specific communication techniques are effective for responding to people experiencing angst brought on by hype around an uncertain or unknown risk.

These techniques have been summarized into easy-to-use templates developed by the Center for Risk Communication.

See figure below as an example template. [🔗](#)

Example Template (CAP)

Use when responding to a high-concern question or statement.



Caring Message:

Provide a message indicating caring, concern, empathy or compassion.

The message should communicate the seriousness of the situation.

Action Message:

State actions you have, are or will take to address the issue or problem. For example, the message might indicate you are cooperating with other organizations or investigating the situation.

Perspective Message:

Provide information that puts the issue in perspective or context.

Lessons Learned from Recent Cyber Attacks on Water Utilities

By Brad Hamlett, Founder,
Cyber Risk Analysis Group (CRAG)



HOW CAN SMALL AND MEDIUM WATER UTILITIES DEFEND THEMSELVES

Recently, hackers breached a large water utility in the southeast by starting with a phishing email. While the precise technical details of the cyber-attack are confidential, small and medium water utilities can still learn a lot from it. Large water utilities generally have large, very talented, well-resourced information technology teams and have already made significant investments in the cybersecurity of their Information Technology (IT) and Operations Technology (OT) networks. No network is ever completely secure, and the recent breach turned into a great example of what doing things right looks like. The utility contained the attack within one segment of their IT network and its operations were minimally impacted. This is a huge win. The big takeaway: cybersecurity investments pay off.

In contrast, last year, hackers breached a small water utility in Colorado and ransomed a large part of its network. The utility had not prepared for this type of attack. Thankfully, they refused to pay the ransom. They restored their data on their own, but lost access to critical parts of their IT network for more than 3 weeks. They brought in outside help and spent six figures on new data infrastructure to reduce the likelihood of a future attack.

Small and medium water utilities need to plan for modern threats, make investments in cybersecurity, and

plan for outages. If large utilities with excellent IT teams can be breached, that means that small and medium water utilities without large IT teams need to bring in outside cybersecurity help.

WHY SMALL AND MEDIUM WATER UTILITIES ARE TARGETS

Foreign governments and for-profit hacking groups are the two types of attackers most likely to target utilities. Most foreign adversaries may not spy on small and medium water utilities because the populations they serve are too small to cause large-scale chaos in the event of a war with the United States. However, for-profit hacking groups are interested in small and medium utilities. They are looking for targets that can net mid-five to mid-six figure payouts. These payouts are collected either by ransomware or by selling customers' personally identifiable information (PII), also called nonpublic personal information (NPI) in some contexts.

According to Symantec, social security numbers sell for an average of \$0.80 on the dark web, driver's licenses sell for a minimum of \$25 each, and complete identities sell for an average of \$65 each. A small water utility collecting this information on 5,000 customers can easily net cyber thieves a six-figure payout just from PII. Small water utilities are very lucrative targets for cybercrime.



Lessons Learned from Recent Cyber Attacks on Water Utilities

ENGAGE WITH THE CYBERSECURITY COMMUNITY NOW

If a utility hasn't started assessing its cyber risks and planning for outages, start now. The America's Water Infrastructure Act (AWIA) requires small and medium water utilities to assess cyber risks and develop an Incident Response Plan (IRP) for cyber-attacks by December 2020 for medium utilities and June 2021 for small ones. The recent cyber-attacks mean this problem is urgent and needs to be addressed now, not next year.

DEFENSE-IN-DEPTH

The best possible outcome of a cyber breach is that it's contained, and operations are minimally impacted. This happened in the recent attack on the large utility in the southeast. It's what the right response looks like. Common investments in cybersecurity include implementing a defense-in-depth strategy – creating layers of security in the enterprise. Practically, this includes endpoint protection, cybersecurity appliances on the network, and employee training either in-person or online. Small and medium water utilities may not be able to invest millions in an advanced network security stack, but cloud-based solutions are available. Defense-in-depth also includes risk assessments, access controls, vulnerability management, cybersecurity policies, and many other factors.

PHYSICALLY SEPARATE IT FROM OT NETWORKS

It is costly but essential to create physically separate networks for IT and OT networks. This includes separate jacks, cable, switches, and all physical hardware. The US military physically separates networks carrying unclassified and classified information. Think of OT systems as classified information, systems so critical they're worth separating from IT systems handling everyday info. Physically disconnect the OT network from the internet. No physical internet connection exists between the military's classified

and unclassified networks. Nor is there a good enough reason for your OT network to be connected to the internet.

PLAN FOR OUTAGES

This is worth repeating – no network is ever completely secure. The CRAG rule of cybersecurity is: If it exists, it will be hacked. A robust Incident Response Plan (IRP) is essential. Utilities are very familiar with Emergency Response Plans (ERPs), and an IRP is the same thing for information systems. If you hire a consultant for AWIA compliance, make sure they complete an IRP for cybersecurity risks.

CONDUCT TABLETOP EXERCISES

A robust cybersecurity program includes planning and practicing for data infrastructure outages. Know how to immediately shut down the compromised systems and switch to alternate systems to maintain continuity of operations. Train for these contingencies and conduct tabletop exercises simulating an outage. Training pays off – as we've seen with recent attacks.

ENGAGE WITH INFORMATION SHARING NETWORKS

Isolation makes for easy targets. Engage your water utility with threat sharing networks. Such as Water-ISAC: www.waterisac.org

Brad Hamlett is the Founder of the Cyber Risk Analysis Group (CRAG), a consulting firm specializing in cybersecurity for water utilities. Before founding CRAG, he worked as a Senior Intelligence Analyst and Senior Information Technology Specialist for the US Army at domestic and overseas locations. He can be reached directly at brad@crag443.com.

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ATP – A Novel Microbiological Tool for the Water Sector

By Michael Thomas, Adam Barnett, and Jordan Schmidt

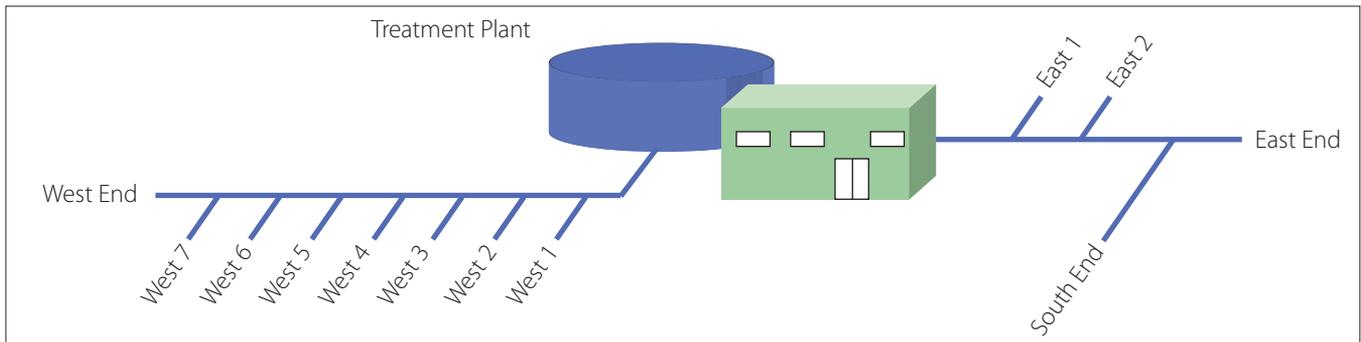
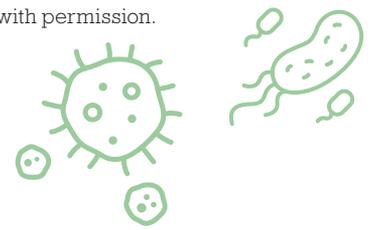


Figure 1: Distribution System Layout (not to scale).

Drinking water treatment plants and water resource recovery facilities (WRRFs) use treatment processes to remove a variety of contaminants to ensure that the final product is either safe for human consumption, or for release into the environment. In the case of drinking water, microorganisms should be removed, while in a WRRF, microorganisms are necessary to produce clean water. In both situations, it is important to have the ability to accurately measure the quantity of living microorganisms. Chemical and physical methods such as chlorine residual and total suspended solids are used to estimate the amount of microorganisms; however these are not direct methods of measuring microorganisms and thus do not tell the full story. Therefore, it becomes important to identify some target of living microorganisms that can be measured directly to quantify their population. Adenosine triphosphate (ATP) is a component of living organisms and is produced and metabolized in all microorganisms as an energy source. ATP is the primary energy carrier for all life forms and can be found only in and around living cells. As such, the measurement of ATP concentration in a sample provides a direct measurement of biological concentration and health. ATP is quantified by measuring the light produced through its reaction with the naturally-occurring firefly luciferase enzyme using a luminometer. The amount of light produced is directly proportional to the amount of ATP present in the sample. The formula below shows the reaction that occurs with ATP in the presence of luciferase enzyme and other reagents.



ATP assays have been used for decades to quantify living biomass according to ASTM D4012 and other associated standards. The specific technology used in this paper is 2nd Generation ATP, which is differentiated from 1st Generation ATP by its increased sensitivity, repeatability, ability to mitigate interferences, and objective quantitative results. Different 2nd Generation ATP kits are available and have been designed for drinking water and activated sludge mixed-liquor, among other applications and industries. Tests can be completed in under five minutes to support rapid decision-making for mitigation activities.

Drinking Water – Rapid Assessment of Water Quality During a Pathogen Outbreak

In response to *Naegleria fowleri* amoeba being found in some Louisiana drinking water distribution systems, action was taken to raise the total chlorine residual to the emergency rule level of 0.5 mg/L throughout drinking water distribution systems. In September 2014, a water services provider collected and tested samples from a chloraminated drinking water distribution system (Figure 1) in order to establish a baseline for total chlorine and biological content.

Initial Assessment

Samples were analyzed for total chlorine (measured in mg/L) and total biological content, measured as cellular adenosine triphosphate (cATP, measured in pg/mL, QGA Kit, LuminUltra Technologies). Typically, a concentration of 1 pg/mL is considered good microbiological control while concentrations exceeding 10 pg/mL indicate corrective action should be taken.

In Figure 2, we can see that there are some serious ATP and chlorine problems at the end of the lines, especially heading towards the West end. It is apparent that as the water extends out into the distribution system, the total chlorine residual drops below the target concentration (0.5 mg/L) and cATP increased rapidly past the recommended corrective action limits (10 pg/mL).

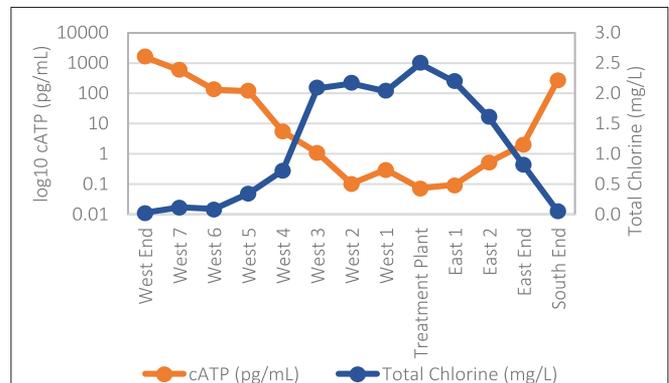


Figure 2: Initial baseline results for cATP and total chlorine.



Cross Connection Removal

The cATP and chlorine concentrations showed that the area between “West 4” and the “West 5” was a hot spot for biological growth. The drop in chlorine and spike in cATP led operators to believe that there was a serious problem in that area. Upon further investigation, it was found that between those sites, and at other sites further west towards the end of the line, there was a cross connection between an old 4-inch line and a new line that was put in years ago. This led to stagnant water in the 4-inch line that would get drawn on when there were times of high demand. Operators subsequently closed off the old 4-inch line, cut it out completely, and retested.

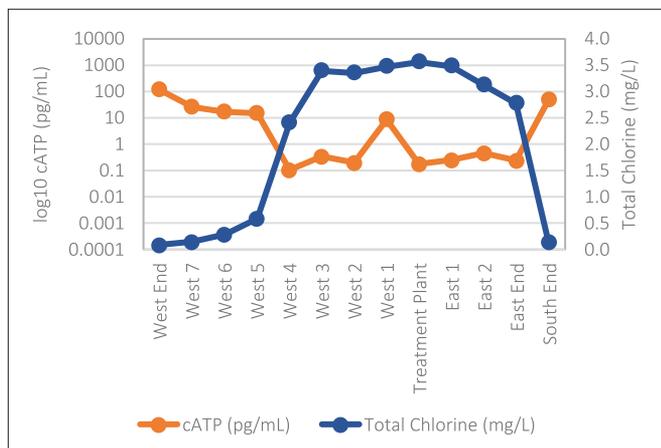


Figure 3: cATP and total chlorine concentrations after the cross connection was removed.

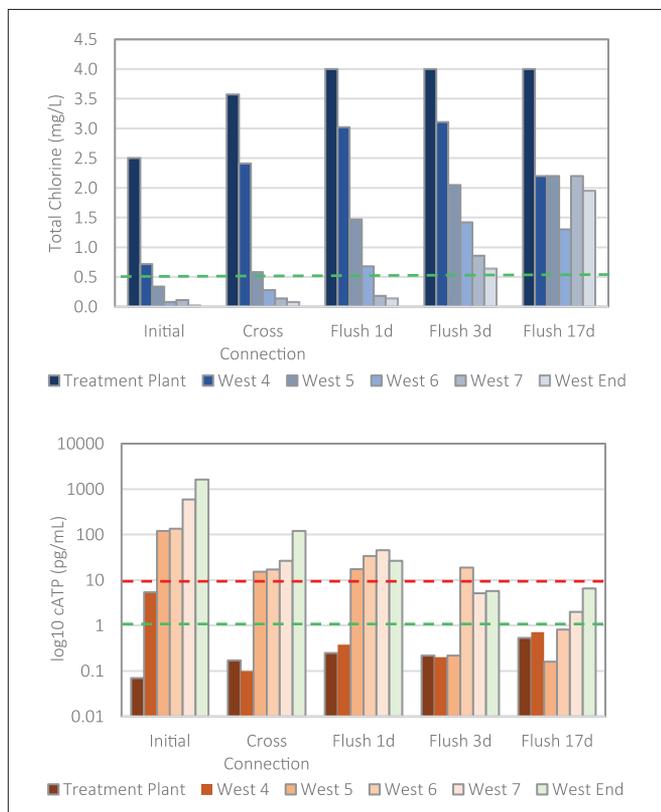


Figure 4: Total chlorine and cATP concentrations at several sample locations throughout the flushing period. Target values are shown by the dashed green line. The corrective action limit for cATP is shown by the dashed red line.

Figure 3 shows cATP and total chlorine concentrations after the old line was cut out. We can see dramatic changes in the cATP concentrations and some better chlorine residuals. This appeared to solve the problem; however the target concentrations still were not met throughout the system.

Flushing & Remediation

It was decided the best way to clear the line of biological growth and increase total chlorine residual was to raise the chlorine concentration and continually flush over the course of several weeks. Figure 4 shows the magnitude of improvement in total chlorine residual and cATP concentrations over the course of this study, with target values shown in green. After 17 days, total chlorine concentration exceeded the target at all sample locations and cATP was below the corrective action limit of 10 pg/mL.

Ultimately, the service provider was able to greatly benefit by utilizing rapid microbiological testing. A cross connection was able to be quickly identified allowing corrective action to occur immediately as opposed to days or weeks later. This resulted in saving time and money and, most importantly, reducing customer risk.

Water Resource Recovery Facility – Monitoring and Interpreting Bioreactor Stress

Microorganisms in a WRRF are susceptible to inhibition from variable facility operations and toxic materials which enter with the WRRF influent. The result is that many WRRFs suffer from poor and variable performance, with above target effluent BOD, or COD, and TSS. In many cases operating personnel are not able to identify the stress or react in a timely manner to compensate for upsets. Having a means to proactively measure the quantity and health of biomass in your process will undoubtedly assist in maintaining adherence to effluent quality criteria.

ATP monitoring is superior to traditional techniques (e.g., MLSS, MLVSS, SOUR) to assess the effects of toxicity and provides a unique view into the true biological activity and health of the bio-system. Because it is tied directly to biological metabolism, ATP will begin to respond quickly to the presence of stress. This means that it provides more accurate information than do interference-prone suspended solids measurements, and more timely information than waiting for effluent quality to change.

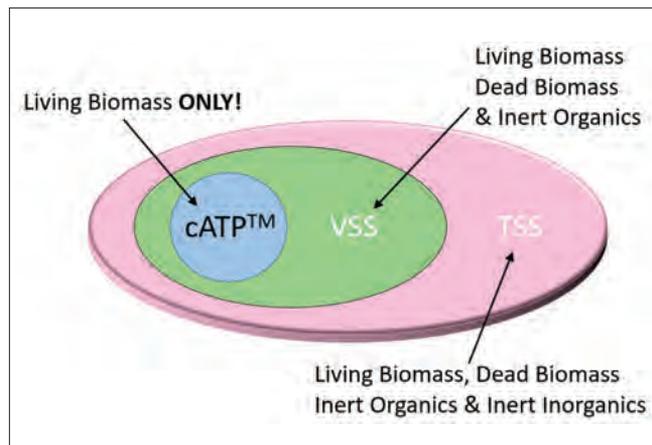


Figure 5: Conventional measurement techniques only tell a portion of the story. cATP testing is a way to quickly assess total living biomass.



Wastewater ATP kits (QG21W Kit, LuminUltra Technologies) can be used to obtain data about:

- cATP – cellular ATP, calculated by measuring dissolved ATP (dATP) and total ATP (tATP) separately.
- BSI – biomass stress index, represented as a percentage (stress level of the microbiological community).
- ABR – active biomass ratio (ratio of solids which are living organisms).

The measurement of cATP allows the most direct measurement of the living biomass, as opposed to VSS or TSS measurements which include dead biomass, inert organics, and inert inorganics as well. Figure 5 shows the benefit of cATP testing to obtain direct results for the portion of living, metabolizing biomass.

Toxicity Monitoring Program Setup

Normally the routine schedule will consist of daily analyses for each bioreactor and at least one combined influent sample. It is normally recommended to do an initial set of tests on component raw influent streams to identify baseline conditions. These can then be repeated periodically and during upsets as source identification during troubleshooting.

The overall strategy of use for ATP from implementation to benefit realization is described in the following steps:

1. Perform an initial intensive monitoring program where a maximum quantity of process samples are collected and tested over a short period. This initial assessment serves to create a 'baseline' to identify critical control points in the process.
2. Based on the results of #1, a routine monitoring program is implemented for a minimum quantity of samples. This long-term program is used to track changes at critical locations. At the same time, establish data storage and statistical process analysis requirements.
3. When #2 reveals significant changes in biomass quality at critical locations, #1 is revisited to explore the nature of the change. This allows operators to establish the severity and source of the change to take appropriate action to mitigate its impacts.
4. Based on the results from #3, operators can evaluate mechanisms to prevent future occurrences of the instigated change. By installing and following this philosophy, incidents that can lead to upsets can be systematically identified, minimizing future occurrences of the same upset conditions. This will improve process stability and, in turn, reduce risk, operating costs, and instances of upstream manufacturing losses.

A routine ATP monitoring program can identify sources of toxicity or stress from upstream activities and, in doing so, can provide significant opportunities to a WRRF operator, such as:

- Fewer facility upsets and improved effluent quality.
- Lower BOD/TSS surcharges, where effluent goes to a municipal WRRF and avoidance of fines in direct discharge situations.
- Faster startup, or upset recovery, without need for importing sludge.
- Minimizing troubleshooting time spent trying to identify causes of upsets.

Data Analysis Strategy

In general, a process is most efficient when cATP is maintained, BSI is minimized, and ABR maximized. Target numbers vary according to facility-specific conditions and are obtained for each system during the initial baseline monitoring phase.

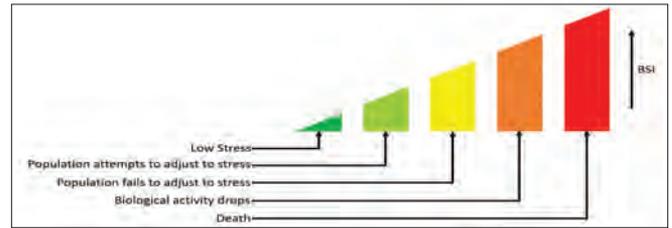


Figure 6: BSI increases as microorganisms die. Larger stresses will lead to more cell death.

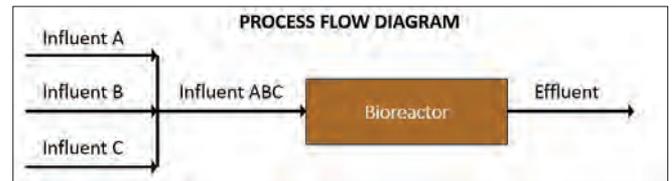


Figure 7: Influent streams A, B, and C are combined to be fed into the bioreactor.

Figure 6 shows the progression of biomass response to stressors. Some stresses are mild and produce a minimal response from the population (the population may be able to adjust and overcome the stress), whereas severe toxicity that enters the process can have catastrophic effects.

Some examples of mild stress are relatively small temperature changes, temporary decreases in available food or oxygen, or an influx of mildly toxic material. Conversely, things like complete loss of aeration or a slug release of toxic material into the plant can cause much more significant stress. The BSI parameter provides the unique ability to assess the severity of the stress on a scale of 0–100% so that the operator can quickly assess the magnitude of the situation. When used in conjunction with cATP trends, the magnitude of the stress can be compared to the change in the population to not only identify the presence of the toxicity but also quantify the damage done and track the recovery process. Conversely, SOUR measurements typically indicate that a problem has occurred by step 4 (biological activity drops).

It is important to note that no one specific concentration of any toxin will affect all biomass in the same way. Each WRRF is different, so it is important to establish a baseline for typical BSI levels over time, including seasonal changes. This way, deviations from the norm can be quickly identified.

Implementation Example #1

The following generic example offers a step-by-step description of how a typical program would be implemented.

In this example, the plant has three main influent components – A, B, and C – feeding into one common influent, ABC. This combined influent is then fed to the bioreactor (Figure 7). The bioreactor has a history of upsets that occur without apparent warning. Operations staff believes that influent toxicity is causing problems in their facility, but they do not know the specific source.

To gain a complete picture of process behavior, the operations staff decides on testing five locations on a daily basis over the course of one week. They justify this approach knowing that there may be daily changes to upstream locations that can result in downstream (bioreactor) impacts, and do not want to assume that a single day of testing will be representative of the long-term.

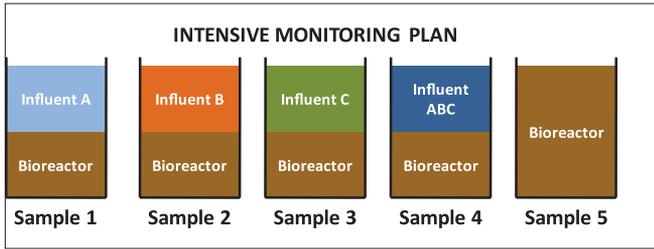


Figure 8: Streams are combined with bioreactor biomass to assess toxicity.

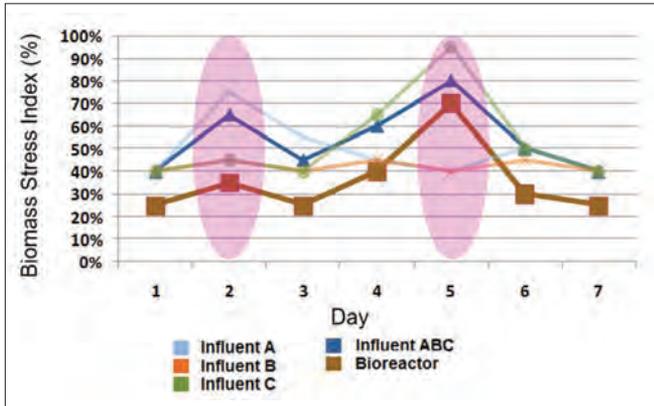


Figure 9: Seven day trend of influent streams and bioreactor control.

In their approach, they will test one sample of bioreactor biomass plus four influent samples mixed 1:1 with the same biomass at t=0, t=1 hour, and t=24 hours. This allows all influent streams to be compared on a relative basis using the actual biomass that would react to any toxicity present.

Following the initial 1-week monitoring program, operations staff reviewed their data, focusing on the BSI data. Figure 8 shows a trend in the BSI with each of the five samples over the one week period. It can be seen that there were two major instances of BSI rises – indicating failing biomass health – in more than one process location during this time. On day 2, BSI rose significantly in Influent A and Influent ABC, but only to a minor level in the bioreactor.

This can be considered a stressful situation but not a major incident since the bioreactor showed little response. On day 5, there was a major rise in three locations: Influent C, Influent ABC, and the bioreactor. Since a significant rise occurred in the bioreactor along with the influent samples, this would be considered a major incident. A quantitative measure of the damage done by this toxicity can be found by analyzing cATP data to see how much of the population was lost.

Given the information collected during the first week of monitoring, operations staff decided to focus their routine monitoring program on two locations: Influent ABC and the bioreactor. These are the most common points of application for ATP monitoring, for two reasons: first, monitoring the biomass is critical to match process failures with biomass issues; and second, monitoring the combined influent stream allows the user to isolate process stress from influent stress.

In the case that testing of Influent ABC causes a marked increase in BSI, further testing can be performed on each individual influent stream to determine the source of the

Control Range	Influent ABC	Bioreactor
Good Control	< 50%	< 30%
Preventative Action	50 – 75%	30 – 50%
Corrective Action	> 75%	> 50%

Table 1: Example BSI Alarm Thresholds.

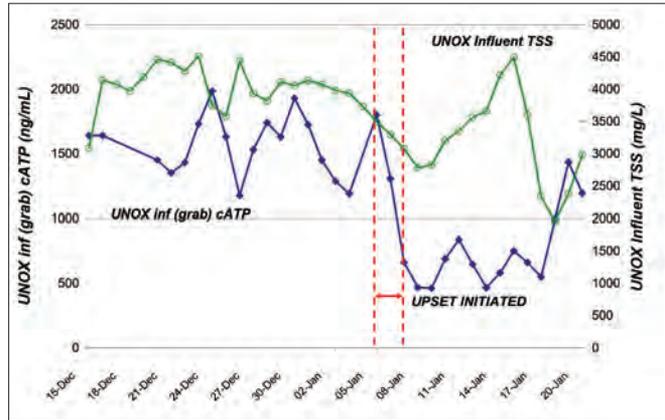


Figure 10: A catastrophic upset caused by toxicity. The severity of the upset is shown by cATP data, but not by TSS measurements.

toxicity. Based on the data collected over seven days, alarm thresholds were determined for both Influent ABC and the bioreactor, shown in Table 1.

Having this information, operations staff could first identify the likely component or components causing toxicity and then undertake bench testing to optimize pre-treatment schemes that would remove that compound before it entered the bioreactor. This could involve physical screening (possibly involving coagulation), chemical treatment to neutralize toxins, or even a biological additive to help the population overcome these issues. ATP analyses performed on these samples before and after treatment can assess their effectiveness and help guide pre-treatment activities in the full scale WRRF.

Although this example is generic in nature, it captures the means by which 2nd Generation ATP testing can be used in any biological water resource recovery process to systematically improve process stability and efficiency to reduce process upsets and the unforeseen costs that go with them.

Implementation Example #2

This example deals with an upset that occurred via a toxic influent stream that had highly damaging effects to the bioreactor. Figure 10 shows how cATP measurements immediately indicate the catastrophic drop in active biomass whereas the TSS trend is much more gradual. The effects of the upset on the biomass population are much more evident when studying the cATP trend compared to the TSS trend. During the two weeks leading up to the upset, the UNOX (bioreactor) cATP averaged approximately 1,600 ng/mL but suffered a 75% drop in a matter of two days. During the same time period, the UNOX TSS only dropped by 13%.



cATP measurements isolate the living population in a mixed liquor sample and therefore respond immediately to changes in the population's surroundings. This typically results in a much higher degree of variability than solids measurements provide. In this case, cATP measurements not only indicated that an upset was in progress, but it also quantified the damage done.

The effects of the biomass kill on process performance were quite evident in the following days. BOD levels in the effluent (Figure 11) experienced an enormous increase in a matter of two days, which matched up perfectly with the drop in the active biomass population. Since there was not an adequate amount of active biomass present to treat the waste, there was a significant amount of unconsumed substrate that proceeded through the plant and out of the final effluent. This quickly put the plant out of compliance in terms of BOD discharge.

The UNOX was also re-seeded using municipal sludge in hopes of bringing the active biomass population back to optimum levels. However, residual toxicity that had been entrained in the UNOX solids caused the environment to be significantly stressful. Figure 12 shows the same data as originally displayed in Figure 10, except with the dates of UNOX re-seeds highlighted. While TSS results show the solids inventory increasing as a result of the sludge additions, cATP results show temporary increases

immediately followed by drops due to the prolonged toxic environment in the UNOX. Based on the entrenched toxicity and failure of reseeded to produce healthy biomass (as measured by cATP), it was decided that the UNOX needed to be purged to remove toxicity. The purging of solids removed the entrenched toxicity and after 1–2 weeks conditions improved sufficiently enough to allow the population to adequately rebound.

Conclusion

The ability to rapidly quantify the concentration of living biomass in a drinking water plant or distribution network, or in a WRRF or reclaimed water sample, allows operators to take action sooner to prevent contamination, avoid toxic upset, and ensure regulations are met in their process. Using 2nd Generation ATP, results can be obtained days sooner than conventional culture testing, and with a much more accurate indication of the microbial population due to the complete nature of ATP testing. There are a range of test kits available depending on the industry and sample type. Major highlights are:

- Rapid – results can be obtained for cATP concentration in less than five minutes.
- Complete – since all living organisms contain and use ATP, it is an indication of the full microbiological population. ATP testing is non-specific and quantifies the total microbial level.
- Quantitative – a calibration standard allows for objective quantification of ATP.

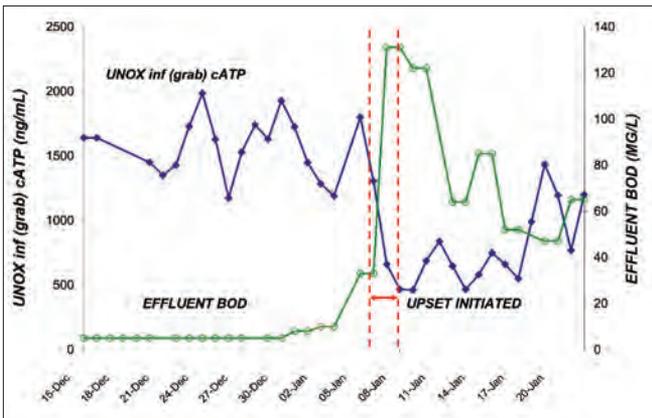


Figure 11: cATP compared to BOD, showing an inversely proportional relationship.

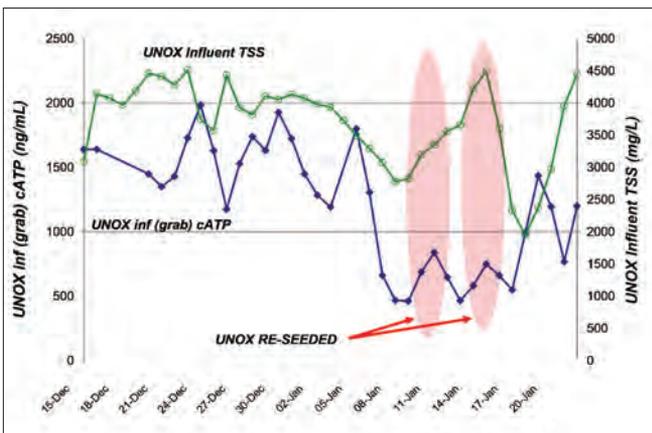


Figure 12: Even after reseeded, cATP levels remained low due to residual entrenched toxicity.





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Membership Engagement & Development Committee and 2020 Vision Subcommittee

2021 has gotten off to an exciting start: the Membership Engagement & Development Committee (MEDC) and 2020 Vision Committee kicked off its Mentorship Program and will be continuing our Diversity and Inclusion efforts throughout the year. As we look forward to spring, it will more critical than ever for the MEDC to promote the value of membership and continue to be a resource to you, our members.

Even though we will not have an in-person conference in 2021, there are still so many benefits that come with your membership!

The value of AWWA membership means something different to everyone. The key benefits of your membership are:

- staying informed,
- professional growth and connections,
- shaping how water works, and
- saving time and money.

Engage with New Members

New members are the lifeblood of our organization. If you are a Subsection leader who is looking for ways to engage new members, we have resources and tools, including 'welcome email' templates, to help you better understand your Subsection membership. For more information, visit www.sites.google.com/a/pnws-awwa.org/membership_committee.

Help Promote the AWWA and Develop Membership – Join MEDC

The MEDC and 2020 Vision are actively recruiting for member volunteers.

- **Expand your network:** Outreach to Subsections to provide leadership with effective tools to engage their members.
- **Gain leadership skills:** Support membership initiatives and ensure we continue to be a thriving Section. To learn more, please contact Chair Chris Young at chris.young@murraysmith.us or visit our website:



MEDC Purpose: To support the Pacific Northwest Section of AWWA (PNWS) in the engagement, retention, and growth of membership.

2020 Vision: To align with AWWA's strategic initiative for a sustainable future by bridging young talent with the water industry.

Help Create a Welcoming Community for Everyone – Support the D&I Committee

As part of the MEDC, the D&I Committee aims to foster a welcoming and inclusive AWWA culture that champions meaningful institutional and individual change regarding diversity and equity in the water industry. The Committee meets the first Wednesday of the month to continue to shape D&I goals, define our focus areas, and develop an action plan. If you are interested in supporting, please reach out to Diversity and Inclusion Chair Esther Chang at esther.chang@jacobs.com.

To better understand current membership and how to attract and retain members, we are creating an anonymous and voluntary survey to collect baseline data such as demographics and feedback to better serve our Section. This information will be collected annually to help identify trends in recruitment and retention efforts.

Our first event was a *Panel Discussion and Social on Being Your Authentic Self* that featured a variety of panelists who are shared their stories and experiences on 'being their authentic self' in the workplace and professional organizations. For more information on our next upcoming event, visit www.sites.google.com/a/pnws-awwa.org/membership_committee/diversity-and-inclusion-subcommittee.



Esther Chang (she/her) is the D&I Chair, a Water Engineer at Jacobs, a previous recipient of the PNWS Ameron Scholarship, and an active member with the YPs and MEDC. She is passionate about promoting D&I in STEM through volunteer work with the University of Washington, Jacobs, and AWWA respectively.

As we look forward to spring, it will more critical than ever for the MEDC to promote the value of membership and continue to be a resource to you, our members.

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Northwest Oregon (NWOR) Subsection

The Northwest Oregon (NWOR) Subsection recently hosted several virtual coffee networking events as well as a first-ever virtual happy hour. The coffee networking events are held approximately every other month in the mornings. Future happy hours will be planned every other month, alternating from coffee networking. The day and time could change slightly but will typically be around 4:30 p.m.

Invitations for both events will be sent through the Subsection.

Coffee Networking Contact Information

Laura Oxsen
Subsection Vice President
laura.oxsen@3j-consulting.com
503-946-9365 ext. 225

Happy Hour Contact Information

Brooke Barry
Subsection Secretary
bbarry@westyost.com
503-451-2146

New NWOR Committee Lead

Please welcome the incoming Young Professionals Committee Lead Trent Brickey. Trent earned a Bachelor's Degree of Science from Oregon State University. In addition to his four years of inspection experience in the private sector, Trent has more than five years of combined experience working in Public Works Operations at Tigard, the Portland Water Bureau, and the City of Corvallis.

Young Professionals Incoming Chair – Trent Brickey



City of Tigard, Engineering Division
trentb@tigard-or.gov
503-718-2686

Committee Description

The NWOR Subsection Young Professionals Committee organizes events to provide new and young professionals and students with opportunities to network and learn about the water industry. Examples of past events include tours of facility construction or operating facilities, educational presentations, networking events, and informal happy hours. A new/young professional is defined by AWWA as anyone under the age of 35 and/or who has less than 10 years of experience in the water industry. All who are employed in the water industry are considered professionals.

Volunteer Needs

Our Organization Committee is always looking for volunteers to be a part of our Committee. If you're interested in becoming a volunteer, please contact Brooke Barry at bbarry@westyost.com.



Incoming Subsection Officer – Secretary

We're looking for the next incoming NWOR Subsection Officer.

The Secretary prepares monthly meeting minutes and submits them to the appropriate person to be included in the announcements for upcoming meetings. Takes meeting minutes at Subsection Board meetings and compiles them for occasional submittal to the bank. Assists the Treasurer with the collection of money at regular monthly meetings and may also assist the other officers with the preparation of the Subsection's annual report.

Please contact Brooke Barry at bbarry@westyost.com if you're interested in this opportunity.

Stay Connected Virtual Events

Don't miss our available online events being offered throughout the Pacific Northwest Section. See a listing of all upcoming events with dates, times, topics, and more on the Section website: www.pnws-awwa.org/training/training-opportunities.

Social Media

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King County Subsection

We've come a long way since March 2020, when we were just learning about our new reality with COVID-19 restrictions. It's been a hard year for all of us, however, we've found ways to connect virtually throughout the year and look forward to what 2021 will bring. As a Subsection, we held our first virtual class, moved to virtual meetings, and continue to connect despite not being able to meet in person. In March, we typically host the Water Olympics event; however, due to ongoing restrictions, will be postponed until 2022, when we can gather in-person again.

New Members

If you are a new member to the King County Subsection, we would love to get you connected and learn more about your interests. Connect with our Board Membership Committee liaison Joanie Stultz at jstultz@brwnald.com to get you connected to the right resources.

Training

The Subsection is committed to offering classes to help our members meet their CEU requirements. After re-adjusting our training calendar (in light of moving events to a virtual setting), we hosted our first virtual training in October with GC Systems. The training went well with over 50 participants. We also collaborated with the Northwest Subsection and Central Washington Subsection to offer two additional virtual trainings, *Math for Operators and How to Read Process and Instrumentation Diagrams (P&IDs)*, this winter.

We are planning to offer more virtual classes in 2021. Scheduled classes and times will be posted to our Subsection website and shared via Constant Contact. Look out for further announcements and registration information. For questions related to classes, please contact our Program Director Jim Konigsfeld at jim.konigsfeld@spwater.org or 425-295-3217.



Named KCSS Scholarship



The Education and Training Fund (E&T Fund) invests donations, collected from PNWS members and others, to fund scholarships for students and operators. Over the past several years, KCSS has donated to the E&T Fund. This year, the Subsection met the limit of \$10,000 to have a named scholarship in the next application period, starting in Fall 2021. Thanks to KCSS membership's support and participation in classes and events, we are able to give back to the Section and contribute to the growth of future industry leaders. Thanks everyone for your support of the Subsection!

Board Recruitment

The Subsection is still looking for a new Webmaster to join the Board. We are

looking for a KCSS Webmaster to keep the Subsection website up to date and help get information out to members. The role is a one-year term, with the option to extend for more terms. We are looking for someone who has a passion for communications, and an interest in helping the Subsection improve our online resources. Please reach out to the Subsection President Charlie at charlie.sovacool@consolidatedsupply.com if you are interested.

Want to get involved more in KCSS?

Have you ever attended a King County education or social event and wondered how you could become involved? Or are you interested in getting to know more of the industry folks in our area? The KCSS holds monthly virtual officer meetings and encourages interested people to attend, meet the officers and learn more about the work we do to support the membership. If you are interested in attending any of these meetings, reach out to the Subsection's Secretary, Joanie Stultz, at jstultz@brwnald.com. 

South Sound Subsection

Update

Happy New Year! We hope you are all healthy and continuing to do well during these unprecedented times. As we continue to adapt and do our work in different ways, we are doing our best to stay connected. The South Sound Subsection has continued to meet monthly and do our best to support you.

Trainings

We hosted our first virtual training on Risk Resilience Assessment and Emergency Response Plan in November 2020. Nearly 30 attendees

learned about new requirements, how to conduct the RRA and utilize it when developing or updating emergency plans. Due to technical difficulties, it didn't go off without a hitch; however, the session was informative and the attendees were very engaged. We are planning to host Waterworks 101 again in late March, and hope to have more trainings lined up for the remainder of the year. Visit our website for details.

Upcoming Events

Unfortunately, our favorite events – the Best Tasting Water, Meter Madness

and annual Golf Tournament – are canceled again this year. We are hoping to host some sort of virtual networking event this year; however, crossing our fingers that we will be able to see each other again soon! Stay tuned on our website for updates.

Monthly Board Meetings

Join our monthly Board meetings, scheduled on the third Wednesday of every month. We are still meeting virtually, so it is very easy to tune in and join us. We welcome everyone and are excited to help you get involved and grow in our industry. [🔗](#)

Inland Empire Subsection

The Inland Empire Subsection (IESS) is continuing to hold meetings virtually during this pandemic. Discussions have primarily focused on how to operate as a Subsection and provide continuing education for our water operators and professionals during COVID-19.

The IESS recently hosted its 17th Annual Truck Rodeo (virtually) on Wednesday, February 24 and Wednesday, March 3, 2021, from 7:00 a.m. to 12:00 p.m. Although the competitions couldn't be held in-person, video submissions for service trucks, Best Tasting Water Competition, Gimmicks and Gadgets,

education, and vendor information were accepted. Topics included backflow, landscape irrigation design standards, assets and water quality, state agency updates, and water reuse.

To learn more about the IESS and its Annual Truck Rodeo, contact Bijay Adams at bijay@libertylake.org. [🔗](#)



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Cathy Bailey of Cincinnati and Xylem named recipients of AWWA's Diversity & Inclusion Awards

The 2021 recipients of the American Water Works Association's Diversity & Inclusion Award are **Cathy Bailey** (individual award winner) and **Xylem** (organizational award winner).

The awards recognize an individual, group or organization that has created and maintained diversity and inclusion by establishing an environment that recognizes and effectively utilizes individual talents.

Bailey, Executive Director of the Greater Cincinnati Water Works, is the first African American to lead Cincinnati's major, independent

municipal water utility in its 200-year history. In that role, Bailey supports mentoring efforts by connecting businesses and civic groups with students in economically challenged schools. Bailey regularly serves as a panelist at Gals in Government, which helps young women learn and train to either run for office or advocate for their communities as a citizen, neighbor or leader.

With approximately 16,000 employees working in 150 countries, Xylem is committed to fostering a workplace that creates a sense of

belonging and equity for everyone. Xylem aims to accomplish its five global diversity and inclusion goals by 2025. The Xylem Employee Network Groups connect employees and allies of specific affinity and ensure they have an opportunity to be heard, valued and engaged.

AWWA supports diversity and inclusion as being essential to the growth, structure and continued success of any organization.

The awards will be presented during AWWA's Annual Conference & Exposition (ACE21). [Learn more](#)

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Statement from AWWA CEO David LaFrance on Cyberattack in Florida

The Pinellas County Sheriff's Department in Florida reports that on February 5, a hacker accessed the water treatment system in Oldsmar, FL. AWWA Chief Executive Officer David LaFrance issued the below statement regarding the cyberattack.

The February 5 hacking incident on a Florida water utility is a jarring reminder that the threat of cyberattacks on critical water infrastructure is both real and serious. We live in a world where cyber intrusions are increasingly common in our personal and professional lives. Given the essential nature of water service, it's well known that water infrastructure – and water treatment plants of all sizes – are potential targets of people with bad intentions.

While the Florida incident is unsettling, there are some takeaways that should bring us confidence. First, while the hacker was able to gain access, it appears a vigilant water operator thwarted any potential harm. There's no clearer demonstration that water professionals are essential workers, and the work they do each day protects us all.

Second, the incident makes clear to all water utilities and governing boards that they must take action to prevent or discourage similar attacks. The water sector has been actively addressing cybersecurity issues for many years. In fact, the 2018 America's Water Infrastructure Act requires utilities to complete a risk and resiliency assessment that must include cyber threats to enterprise systems and process

control systems. This incident should underscore the urgency of that work.

Third, we are not powerless against cyber threats. There are resources available to help utilities of all sizes. AWWA's Water Sector Cybersecurity Risk Management Guidance and the accompanying assessment tool are free at www.awwa.org/cybersecurity, as is the Cybersecurity Risk & Responsibility in the Water Sector report and many other helpful eLearning opportunities and documents.

Federal agencies define cyberattacks as the top threat facing business and critical infrastructure. Friday's incident demonstrates why. Let this incident be a constant reminder of the importance of round-the-clock cybersecurity vigilance in the days and decades ahead. 📧

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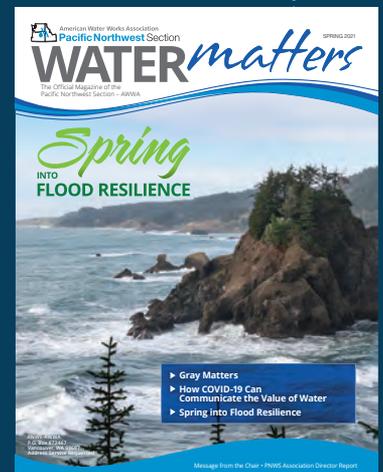


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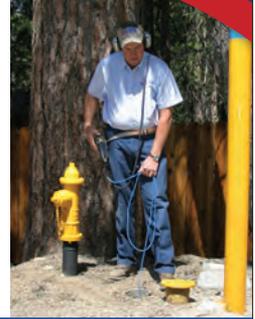
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