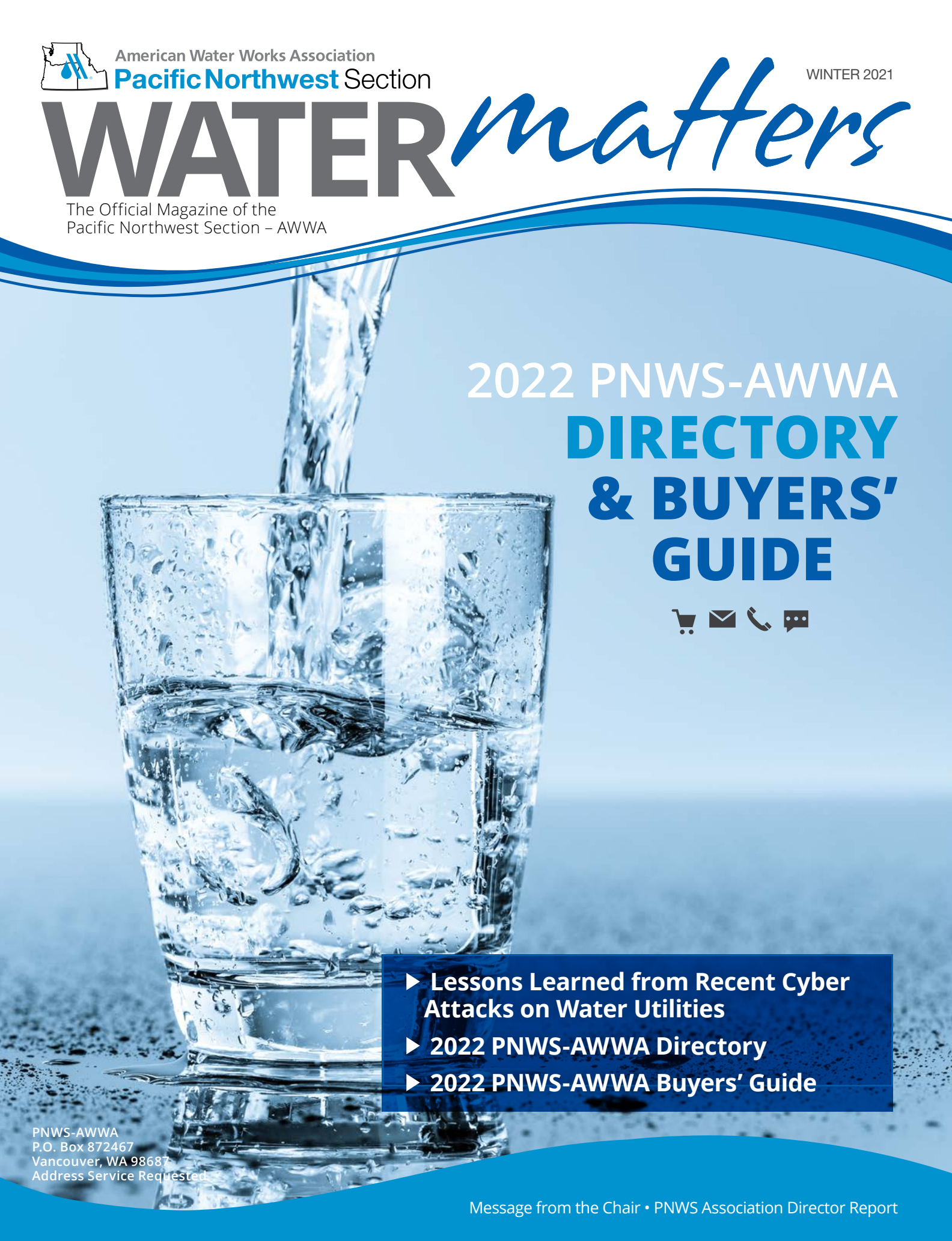
American Water Works Association
Pacific Northwest Section

WATER matters

WINTER 2021

The Official Magazine of the
Pacific Northwest Section – AWWA



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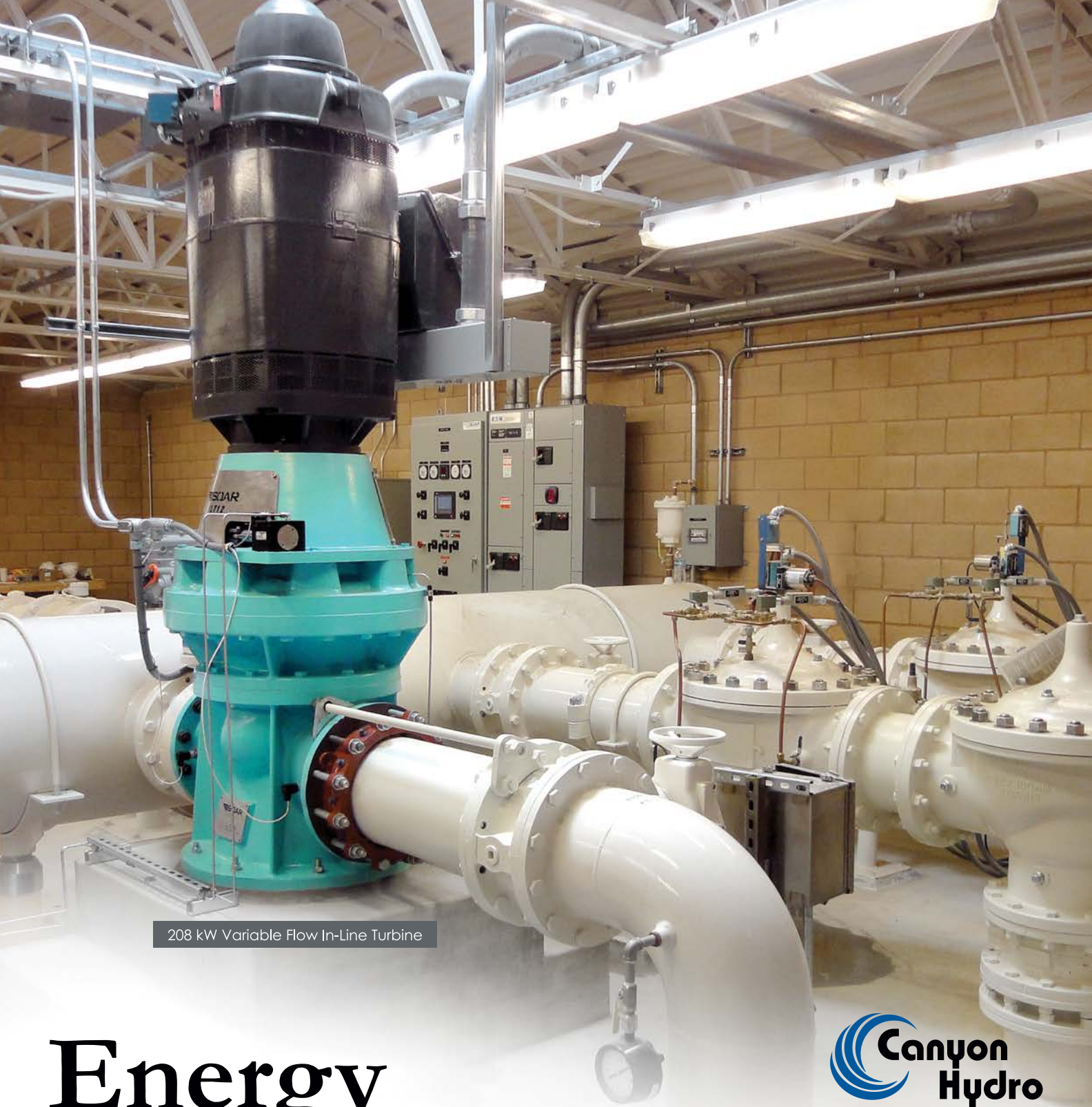

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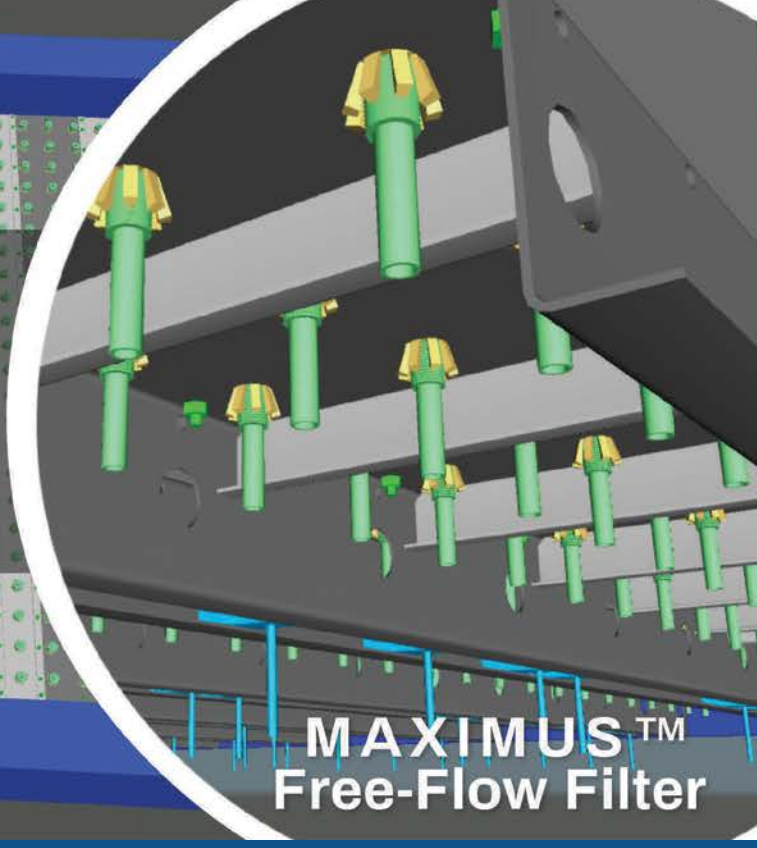

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Be a Role Model

Where does the time go? We all get the same amount of time each day, we set our priorities, and do the best we can to keep all of our tasks in motion. Obviously, some of us are better at time management than others; I generally feel busy but often tell folks that I am as busy as I want to be. As a Section, we rely on volunteers (*perhaps rely isn't the best description*); we **depend** on them. Their work takes time, which brings value to the Section. The vast majority of volunteers have full-time jobs and have to balance their time at work and home. We have some retirees that are still quite active within the Section but they also have a work-life balance to maintain.

Maybe I am preaching to the choir: what I want to do is share ideas and offer encouragement.

I appreciate when I get dates for deadlines, calendar invites for meetings, or project milestones: they help me anticipate, prioritize and manage my time. Lists help me keep track of tasks that require my attention. I typically start my day with a daily 'to-do list.' Calls I need to make; reports to run; meetings to attend; check-ins with crew, staff, friends and colleagues; birthdays; haircuts; gas stops… you name it, it's on my list. I will even add items on a list just to check it off. That might sound odd but I feel it's important to see my productivity in order to keep my spirits up and move ahead.

As a manager and team leader, I am also very aware of burn-out and the need to recharge. It is apparent when I check in with my team and see their progress as well as how they are feeling. If they are feeling overwhelmed, irritable or even just ''off,'' these are all possible indications

If we can recognize when someone is struggling and make an effort to help, that has greater effects beyond simply completing a task. It often encourages and motivates the people you help, and lets them know that it's okay to take a step back and reset.

of burn-out; something we should all try to address when we notice it. Burn-out kills productivity, disrupts rhythm, and has a general negative effect on our tasks, but it also takes something out of a person. If we can recognize when someone is struggling and make an effort to help, that has greater effects beyond simply completing a task. It often encourages and motivates the people you help, and lets them know that it's okay to take a step back and reset.

Lastly, and what is most difficult for me about time management, is to hold myself accountable. We must constantly prioritize tasks and balance what is important while managing our expectations. Taking on too much is an obvious recipe for mistakes or missed targets. If I miss a target because I took on too much, that's a disservice to that task. When we take on too much, it's a missed opportunity for someone else that could have raised the bar collectively for us all.

Another common mistake I make is not taking enough time to re-charge my batteries. Disconnecting and re-centering often leads to increased motivation and a better perspective. When I fall into the cycle where I don't have time to reset or I need to get this done and push through, my productivity slows. I have found that taking a 10-minute break can have great results on my motivation. Another trick I use is to reach out to a friend and just have a casual conversation. I can't count the times I have reached out and had a conversation completely unrelated to what I am working on. That engagement with a friend or co-worker will pick up my spirits tenfold. Having a hobby and taking a vacation are other great ways to disconnect and re-center.

In closing, I suggest that we all need some grace. We all need a pick-me-up now and then as we all have the best intentions. We would not volunteer our time and prioritize our work if we didn't believe in what it meant. The next time you're standing shoulder-to-shoulder with someone, try to remember that you may not agree but everyone wants the best. If you see somebody struggling and can help or share just a kind word, please do so. This world is full of mentors, role models and people we look up to: be that for someone else, it's the most important thing you can do.

John Roth
PNWS Section Chair

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How Confident is Your Utility in Withstanding a Cyber Attack?

Recently, the Executive Committee, Board of Directors, and Six Councils of AWWA met in-person/virtually to conduct Association business in Denver, CO.

It was great to connect, catch up and see so many friends again, after not meeting in person for nearly two years. This gathering was unique since the Board meeting coincided with the Six Councils Summit meetings; I was able to sit in on the Water Utility Council (WUC) and Manufacturers and Associates Council (MAC) meetings – something that I never had the opportunity to do before. I appreciated having this front-row seat to the Council's expertise and knowledge that is helping members of the AWWA.

One of the focus briefings and discussion areas, during the Board of Directors meetings and Water Utility Council, was cybersecurity and its serious threat to utilities. Where I work, our customer billing vendor was a victim of ransomware attack. Our District took a very proactive approach in notifying our customers and ensuring open communication regarding the extent of the situation that occurred with the vendor. An IT forensic audit was conducted, and it determined that none of our customer information or data was compromised. We were able to correspond with our customers and assure them with certainty that their information was not impacted through the ransomware attack with our vendor. This example highlights the issues facing utilities on a lot of different fronts.

Cyber risk is a serious threat, and it is critical for your utility to make cybersecurity a top priority. These attacks are happening almost daily. Drinking water and wastewater systems not only manage sensitive personal data but also operate process systems that are essential to the day-to-day operation. The federal government has labeled the water sector as the weakest link in the possibility of cybersecurity breaches in comparison to other utility sectors.

The growth of the Internet – and more specifically the industrial Internet – has led to a greater efficiency in leveraging data to optimize utility operation and processes. This also includes employees with smart phones, tablets, and laptops that allow for remotely accessing, monitoring, and managing the system. Most, if not all, utility employees have computers that support some level of Internet connectivity for business purposes, like email. This may or may not include the computer that runs Supervisory Control and Data Acquisition (SCADA). Everyone is at risk of clicking on something that has a virus, which can expose and financially and/or operationally cripple a utility.

Cybersecurity is not a simple issue. The Board and Water Utility Council are actively working to put forth information to help utilities and educate the federal government on what utilities need to protect their systems.

Utilities must take proactive steps to ensure that there is a plan, program, and process in place to prevent, detect, and respond to cyber threats. It is essential to prevent serious repercussion from a cybersecurity attack as well as any related reputational harm to the impacted utility that is experienced by way of reduced customer confidence.

I was really pleased to hear how seriously and aggressively the AWWA is taking this issue and helping utilities manage the serious threats. AWWA has set up a cybersecurity guidance and assessment tool at *www.awwa.org/cybersecurity*, which is free, available online, and can be used to evaluate the controls most applicable to individual water and wastewater systems. These resources are developed and issued by the National Institute of Standards and Technology and the United States Department of Homeland Security.

In the not-too-distant future, the AWWA will be sharing more information and ways to help you, as operators and supervisors, and your utility make the case for elected officials and governing bodies to invest in cybersecurity protection levels in order for you to properly serve your customers.

Randy Black
PNWS Association Director
and VP AWWA

Member Engagement and Development Committee and 2020 Vision Subcommittee

As we roll into the winter season, the Member Engagement and Development Committee (MEDC) will focus on supporting our Subsections and being a local resource for our members. During the Fall Subsections and Committee Training, we had some great conversations with you regarding how we can be a better resource!

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.

The MEDC is looking forward to and preparing for its upcoming Section Conference in May. In the meantime, we will continue to provide resources for our Subsection and Committee leadership to:

Promote the Value of Membership

Whether you are a new or a longtime member, the MEDC is here for you. We're tasked with the following:

- connect new members with resources,
- provide membership lists to subsection leaders,
- run the **PNWS Mentorship Program** to pair mentors and protégés on an annual basis, and
- support student involvement in partnership with the YP Committee.

If you are a Subsection leader and need help with tracking your membership lists, we're here for you.

SCAN ME

For membership support, please connect with the MEDC Chair Chris Young (*chris.young@murraysmith.us*) or visit our website at *www.pnws-awwa.org/member-groups/committees/membership-committee.*

Diversity & Inclusion (D&I) Committee Updates

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. We meet the first Wednesday of the month; to join, please connect with Esther Chang, D&I Chair, at *esther.chang@jacobs.com.*

The Committee is looking forward to the Conference in May, with several presentations focused on topics related to diversity, equity, and inclusion in the water industry. Watch for the D&I-related presentations in the Conference line-up.

Membership Survey Update

Thank you to all who participated in the Membership Survey this summer. The D&I Committee reviewed the results, and prepared a summary and takeaways that were presented at the Fall Training. The objective of the Survey was to better understand current membership and how to attract and retain members. Overall, the majority of participants felt included in the Section, and recognized areas for improvement where the MEDC and Board leadership can shape programs and promote a more inclusive environment. The full report is available on the Membership Committee website, under the 'Diversity & Inclusion' tab.

Based on the feedback from the Training, the Committee is working to develop our plan for using the Survey in the future to continue to learn and grow.

Native American Heritage Month

The AWWA celebrates National American Indian/ Alaska Native Heritage Month. We appreciate and recognize the many contributions native peoples have made to our membership and the water Sector.

To learn more about Native American Heritage Month and ways to participate, visit *www.nativeamericanheritagemonth.gov.*

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PUTTING THE "PRO" IN PROJECT MANAGEMENT

WHAT DOES PROJECT MANAGEMENT MEAN TO YOU?

For some, it's simple scheduling and logistics. For others, it's making sure the budget stays on track. For us, it's deeper than that.

Our project management experts serve as an extension of your team, working alongside you from start to finish. When you collaborate with us, you benefit from access to an expansive portfolio of online and in-person tools and capabilities to track projects, materials, costs and more. Beyond that, you benefit from expertise you can trust, experience you can count on and an unparalleled inventory of products—all from a single, dedicated partner.

Engineering Committee

Excellence in Engineering Awards

Do you have an excellent project you want to show off? Persons, agencies, consultants, contractors, and water utilities that have recently completed (or will soon be completing) a project in Idaho, Oregon, or Washington may apply. Please nominate any project that you feel is deserving of an award. The entry deadline is **January 14, 2022**.

The nomination form and submission requirements can be obtained by contacting Nick Robertson at *nrobertson@dowl.com* or 503-701-8650.

Section Conference and In-person Committee Meeting

The Engineering Committee is looking forward to the 2022 Tacoma Conference and has some great technical tracks planned! We're excited about our preconference session that will discuss the recent ice storms, wildfires, and supply chain issues that have tested our resilience over the past year.

During the Conference, we will hold an in-person Committee meeting that will include Officer elections. We will advertise our meeting through our email distribution list and discuss logistics at upcoming Committee meetings. Please contact our Chair, Joelle Bennett, at *joelle.bennett@tvwd.org* or 503-941-4577 if you need additional information or would like to attend.

Committee Meetings Schedule

If you have an idea for engineering-related learning or industry collaboration, please connect with one of the Officers directly, or join our next meeting to discuss the idea and hear about others in process. We meet the second Wednesday of each month, from noon-1 p.m., via Teams. Any Officer can forward you an invite.

Seattle Women in Leadership Symposium: Achieving a _____ Future

Wednesday, February 9, 2022, at Brightwater Center

The 2022 PNWS-AWWA Seattle Women in Leadership Symposium is taking place on Wednesday, February 9, 2022.

This year's theme, *Achieving a _____ Future*, will explore our impact on the future. We are preparing for an in-person, morning event to take place at Brightwater Center (at the Brightwater Clean Water Treatment Facility). We will be announcing the complete agenda with speakers and topics later this year, so stay tuned!

Plan to join us: registration is currently open!

Note: our event will comply with state mask and vaccination mandates/guidelines in effect at the time of the event.

Questions? Contact Erika Schuyler at *erika.schuyler@murraysmith.us.*

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UTILITY MANAGEMENT COMMITTEE
An In-person Training Event, Scheduled on January 27, 2022, in Vancouver, WA

We are ready to get back to in-person training and networking!

Join us at the Utility Management Committee (UMC) 2022 Conference, scheduled on Thursday, January 27, 2022, at the Vancouver Water Resources Education Center, from 8:30 a.m. – 4:00 p.m.

The theme is "Financial and Workforce Sustainability" and will feature presentations on:

- **Water Rates**
- **Water Infrastructure Funding**
- **Leadership Training**
- **Succession Planning**
- **A Water Operator Internship Program**

The training is approved for WA and OR 0.6 Drinking Water CEUs.
Local COVID-19 requirements will be enforced.

Registration is open at
http://events.r20.constantcontact.com/register/event?llr=fdcbrhjab&oeidk=a07eioe6ie8dc760213

New Energy Recovery System
Produces Renewable Energy from Water Pipeline

Skagit PUD is one of the first water agencies to install a new technology, the In-PRV from InPipe Energy, that converts excess water pressure into carbon-free electricity, reduces operational costs and helps combat climate change.

Skagit Public Utility District and InPipe Energy are pleased to announce the completion of the **East Division Street Energy Recovery Project** at Skagit PUD's East Division Street booster pump station in Mount Vernon, WA. Skagit PUD's installation is the first pressure recovery project in the State of Washington that utilizes the In-PRV from InPipe Energy, a new smart water and micro-hydro system that generates electricity by harvesting excess pressure from municipal water pipelines.

By recovering the energy embedded in excess water pressure and converting it into electricity, the system will generate up to 94,000 kilowatt-hours (kWh) or more of electricity per year while providing pressure management that helps save water and extend the life of the pipeline.

The electricity produced will be used to offset the use of grid power at the pump station, saving Skagit PUD (and its ratepayers) money and replacing the equivalent of 3.5 million pounds of fossil-fuel-based carbon emissions annually. The project was made possible with assistance from Puget Sound Energy (PSE), as part of its "Beyond Net Zero Carbon" initiative, and a Coal Transition Board Grant from TransAlta energy company.

"Converting excess water pressure into clean, renewable energy is a win for the environment and our ratepayers," said George Sidhu, Skagit PUD General Manager.

"Environmental stewardship is one of Skagit PUD's core values; and in our actions, we want to preserve our region's natural resources. As a public utility, we're always looking to innovate and create greater efficiencies in the operation of our water system, and the East Division Street micro-hydro project checks all the boxes," Sidhu added.

"The world's water infrastructure is energy and carbon intensive," said Gregg Semler, President and CEO of InPipe Energy. "We see a large, global opportunity for water agencies to meet their mission while also battling the impact of climate change. The sustainability of our nation's water systems is paramount, yet water agencies are being constantly challenged with rising energy costs and aging infrastructure. By providing a more precise way to manage pressure in pipelines – while also producing electricity – our In-PRV product helps water agencies offset their energy costs while saving water, reducing carbon and extending the life of their infrastructure."

In January 2021, Puget Sound Energy set its aspirational "Beyond Net Zero Carbon" energy company goal. Through this initiative, PSE targets reduction of its own carbon emissions to net zero and goes beyond by helping other sectors to enable carbon reduction across the State of Washington.

"We value the opportunity to provide this energy efficiency program grant to Skagit PUD to help them be more efficient and build resilience," said PSE President and CEO Mary Kipp. "This partnership reflects our commitment to combat climate change by reducing our own carbon emissions to net zero and helping other sectors to enable carbon reduction across the State of Washington."

TransAlta, which is in the process of phasing out its last coal-fired power plant in Centralia, WA, by 2025, has committed to supporting local communities and renewable energy development through its Coal Transition Board Grant process.

"We are committed to the development of innovative new forms of renewable energy, and this energy recovery project at Skagit PUD sets a great example for the role water utilities can play in making both water and energy more sustainable," said John Kousinioris, CEO of TransAlta. "We are excited about the potential for the In-PRV to produce carbon-free electricity from water pipelines across North America."

"Water is a critical resource in Skagit County as it relates to power generation, and this project demonstrates our regional leadership," said Sidhu.

The In-PRV Pressure Recovery Valve

Skagit PUD's pump station is the second installation of the In-PRV in a municipal water pipeline. The first, in the city of Hillsboro, Oregon, came online in September 2020 and is on track to produce 200,000 kWh or more of electricity each year.

Here's how the system works:

- Water agencies typically deliver water to customers by gravity feed and use control valves, called pressure-reducing valves (PRVs), to manage pressure in their water pipelines. PRVs help protect pipelines from leaks and deliver water to customers at safe pressure.
- Normal PRVs use friction to burn off excess pressure, which is dissipated as heat. All of that energy is, essentially, wasted.
- InPipe Energy's In-PRV pressure recovery valve system performs like a highly precise control valve. But it takes the process one step further by converting the excess pressure into a new source of carbon-free electricity.
- The In-PRV is the first system that combines software, micro-hydro and control technology as a turnkey product that can be installed quickly, easily and cost-effectively throughout water systems with smaller-diameter pipelines and wherever pressure must be reduced.

Learn more about the In-PRV at *www.inpipeenergy.com.*

LESSONS LEARNED FROM RECENT CYBER ATTACKS ON WATER UTILITIES

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 three 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.

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 U.S. Army at domestic and overseas locations. He can be reached directly at *brad@crag443.com*.

PFAS Regulatory Changes ARE COMING SOON

What You can Do to Better Prepare

By Lynn Stephens, P.E.; Damon Roth, P.E., BCEE; and Joanie Stultz, P.E. with Brown and Caldwell

Per- and polyfluoroalkyl substances (PFAS) are routinely mentioned in the news, leaving questions in the mind of the public if their water system will be impacted by these "forever chemicals" and creating uncertainty for the individuals managing those systems. The good news is that since the first provisional Health Advisory Levels (HALs) for PFAS were established by the Environmental Protection Agency (EPA) in 2009, the industry has focused research on treatment technologies for the removal of PFAS. Reliable solutions are available to remove PFAS from drinking water sources. The bigger challenge is how to prioritize next steps in the face of a changing regulatory landscape and competing demands on resources. Despite the unknowns, there are steps you can take now to get ahead of this issue.

PFAS not detected in your system? That could change soon.

PFAS represent a group of thousands of synthetic chemicals that persist in the environment because they do not readily degrade and are used for things like fire-fighting foams and water repellent fabrics, cookware, and to-go food containers. As analytical methods continue to improve and regulations evolve, more PFAS constituents are being investigated than in previous years. So, even if you haven't yet detected PFAS in your source water, that could change.

Following establishment of EPA's first provisional HALs for PFAS, monitoring for six PFAS was included in the third round of the Unregulated Contaminant Monitoring Rule (UCMR3) with sampling from 2013-2015. At that time, the analytical methods were limited to method reporting limits (MRL) from 10 to 90 nanograms per liter (ng/L); therefore, sources of PFAS present at levels below the MRL went undetected. Since then, testing methods have improved and the MRL for many PFAS has decreased by an order of magnitude to as low as 2 ng/L, allowing detection of 29 PFAS at much lower levels.

In 2016, EPA released an updated HAL, which superseded the provisional HALs, which set a combined HAL of 70 ng/L for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) (see table below). Since then, states have gotten out ahead of the EPA and have been setting their own HALs and state action levels (SALs) (see table below). The Oregon Health Authority (OHA) established HALs for four PFAS. Washington's PFAS Rule is anticipated to go into effect in January 2022, establishing SALs for five PFAS and requiring water systems to sample by December 31, 2025. In October 2021, EPA released a PFAS Strategic Roadmap, which aims to establish a national primary drinking water regulation for PFAS in fall 2022 with a final rule expected in fall 2023.

Previously, PFAS were predominantly detected where there was a notable source of contamination (i.e., near firefighting training facilities, military bases, etc.) resulting in elevated levels of PFAS in nearby groundwaters. However, on the horizon are new federal requirements for sampling under the Fifth UCMR (UCMR5) for all states. Additionally, Washington's PFAS Rule will require sampling by 2025, and Oregon Health Authority (OHA) and Idaho have received EPA grants to sample water systems themselves. Because of improved analytical methods, water systems may now detect PFAS at sites where there is no obvious source or where prior sampling under UCMR3 resulted in no detections.

Pertinent PFAS Advisories (ng/L)

PFAS	EPA HAL	Oregon HAL	Washington SAL
PFOS	70 (total of PFOS + PFOA)	30	15
PFOA		30	10
PFNA	Not Included	30	9
PFHxS	Not Included	30	65
PFBS	Not Included	Not included	345

What can you do now to get ahead?

- Sometimes the best first step is to look more broadly to see solutions from a higher level. To help get a handle on PFAS in your system, here are some early steps you can take to get ahead:
- Understand the impact of new regulations (e.g., state HALs and SALs) on public notifications and your water system
- Establish a sampling program early to understand the impact of new MDLs and develop a plan as needed for mitigation and management
- Create public communication on PFAS to build trust with customers
- Depending on PFAS levels detected in source water, conduct a Treatment Feasibility Study to budget for capital improvements and increased operation and maintenance (O&M) costs

Example Design for GAC PFAS Treatment Facility (Brown and Caldwell project for Washington client)

- Develop a one-water approach to investigate PFAS management utility-wide to understand impacts from PFAS across your system and establish short- and long-term management goals
- Identify sources of PFAS contamination and understand legal and technical options
- Communicate with councils and boards to inform selection of water quality goals
- Bench-scale and/or pilot testing to evaluate and select treatment technology and media (i.e. for Granular Activated Carbon [GAC] and Ion Exchange [IX]) as step to develop full-scale PFAS treatment (see example of full-scale GAC Facility application to left)
- Identify funding or finance resources to help you get started.

In the past decade, with growing focus on PFAS, a wealth of resources including health impact research, technical guidebooks, and case-studies have been developed to support communities dealing with PFAS. The Association of State and Territorial Health Officials (ASTHO) provides a PFAS Risk Communications HUB with a collection of related information that is updated regularly with the latest health research, regulatory requirements, and technical resources (*www.astho.org/PFAS*). Additionally, AWWA has developed several resources for technical practitioners, accessible through the website.

Regulatory changes are moving fast and can be hard to keep up with among other priorities; therefore, the best approach is to start preparing now, understand if and how your system is impacted, and develop a plan.

About Brown and Caldwell

Brown and Caldwell is an employee-owned environmental consulting firm, with a focus on making a positive impact on our environment. We are a leading expert for drinking water treatment and can provide technical support through our team of industry experts to assist you with your PFAS challenges. BC has a suite of recent projects on planning and design for PFAS treatment and are focused on industry-leading research for PFAS removal and destruction. BC also uniquely offers in-house Treatability Lab services, including bench-scale testing to optimize PFAS treatment for capital and O&M savings.

Lynn Stephens, P.E., is the Northwest Drinking Water Leader for Brown and Caldwell (BC) in Seattle, Washington, and a subject matter expert for granular activated carbon (GAC) adsorption and filtration. (*lstephens@brwncald.com*).

Damon Roth, P.E., BCEE is a Senior Principal Engineer and a subject matter expert in drinking water process engineering with BC in Ritzville, Washington (*droth1@brwncald.com*).

Joanie Stultz, P.E., is a process engineer with BC in Seattle (*jstultz@brwncald.com*).

Guidelines for Use of **Mini-Horizontal Directional Drilling** for Placement of HDPE Pipe for Water Applications

By Dr. Lawrence M. Slavin, Outside Plant Consulting Services, Inc.

Introduction

User-friendly guidelines for the placement of high-density polyethylene (HDPE) pipe with mini-horizontal directional drilling equipment have been developed by the Municipal Advisory Board (MAB) of the Plastics Pipe Institute (PPI). Previously available as Technical Report TR-46, published in 2009, *MAB Guidelines for Use of Mini-Horizontal Directional Drilling for Placement of HDPE (PE4710) Pipe in Municipal Applications* emphasizes the applications for potable water and sewer projects, and provides detailed information for both IPS and DIPS size pipes, constructed of the latest PE4710 material. MAB-7 provides information analogous to that provided in ASTM F1962, *Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings*, but is more appropriate for mini-HDD technology and typical project characteristics.

MAB-7 includes the following 10 main sections, as well as six supporting appendices:

- Scope
- Referenced Standards and Specifications
- Terminology
- Preliminary Site Investigation
- Safety and Environmental Considerations
- Regulations and Damage Prevention
- Pipe Design and Selection Considerations
- Bore Path Planning and Drill Rig Setup
- Implementation
- Completion

The document is readily available to the public at *www.plasticpipe.org/pdf/mab-7-mini-hdd-guide.pdf.*

Background

Figures 1 and **2** illustrate typical mini-horizontal directional drilling (mini-HDD) equipment and pilot boring and back-reaming operations, including placement (pullback) of the product pipe, such as for water distribution applications.

Mini-horizontal directional drilling (mini-HDD) is typically employed for boring segments less than 600 feet in length, at depths up to 15 feet, and placing pipes up to 12 inches diameter. In contrast, maxi-HDD technology is capable of accurately boring holes thousands of feet in length, and placing pipes of 48 inches (or greater) at depths up to 200 feet Maxi-HDD machines may weigh as much as 30 tons (or greater) and is appropriate for placing pipes under large rivers or other major obstacles.

ASTM F1962 provides recommended procedures for the placement of HDPE pipe using maxi-HDD. The ASTM document provides overall guidelines, addressing preliminary site investigation, safety and environmental considerations, regulations and damage prevention, bore path layout and design, implementation, and inspection and site clean-up. One of the significant contributions of ASTM F1962 is the provision of a rational, analytical method for selecting the polyethylene pipe strength based upon the estimated installation and post-installation (operational) loads on the polyethylene pipe. ASTM F1962 provides a means of determining project feasibility and initial design information.

While the ASTM F1962 guidelines are convenient and practical to apply for a maxi-HDD operation, the corresponding equations and procedures represent relatively complicated formulae –

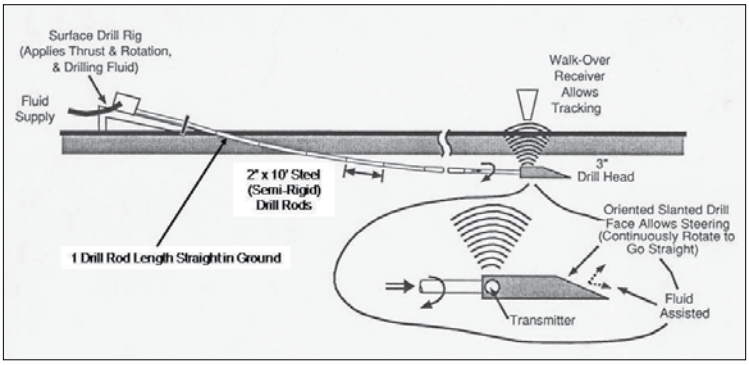

Figure 1. Typical Mini-HDD Equipment and Pilot Boring Process

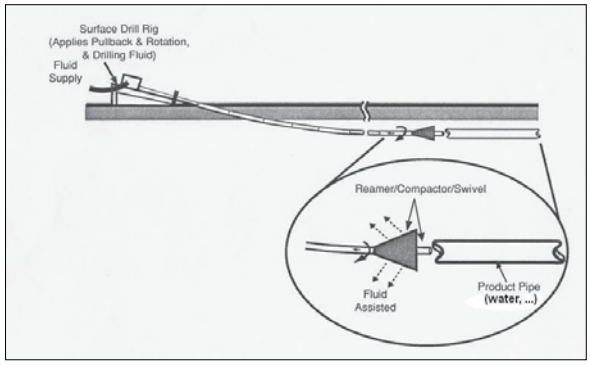

Figure 2. Typical Mini-HDD Back-Reaming and Pipe Pullback Process

and an extensive tedious methodology – when considering smaller, lower cost operations associated with typical mini-HDD applications and placing a new water or sewer distribution line. Nonetheless, some mini-HDD installations may be relatively critical or approach limits, with respect to the capability of the available drill rig and/or the strength of the product pipe being installed; therefore, a relatively convenient, although possibly less precise, design procedure would be desirable. Furthermore, any construction procedure must address basic safety rules, avoid damage to existing facilities, adhere to applicable government regulations, and consider environmental issues.

MAB-7 was developed to serve as an inclusive document, providing practices for placement of HDPE (PE4710) pipe, for municipal applications, using mini-HDD. MAB-7 includes easy-to-understand guidelines for proper drill rig positioning –consistent with meeting required placement depths and drill rod capabilities and estimating the relevant forces and effects present during installation – and proper selection of the pipe strength.

Description

MAB-7 contains 10 main chapters or sections, as briefly described below, supplemented by several appendices.

Scope, Related Industry Standards and Terminology (Sections 1, 2 and 3)

MAB-7 addresses planning, design, drill rig setup, and installation practices for the placement of polyethylene pipe using mini-HDD equipment. The primary focus is on commonly used high density polyethylene (HDPE) pipe with a material designation code of PE4710. Depending on the diameter, polyethylene pipe may be supplied in continuous lengths on a reel or discrete segments which would typically be fused together in the field.

Preliminary Site Investigation (Section 4)

The general feasibility of utilizing mini-HDD technology for placing the proposed pipeline(s) must be determined prior to any proposed construction activities. A preliminary investigation is required to gain an understanding of the local characteristics to help ensure a cost-effective, efficient and, above all, safe operation. Of particular importance, and as addressed in other sections of the guidelines, is the awareness of existing utilities in the vicinity of the proposed pipeline and the need to maintain minimum specified clearances during the construction process.

Safety and Environmental Considerations (Section 5)

Safety is a primary concern, during any activity, including construction utilizing mini-HDD equipment and procedures. Potential safety issues fall into two general categories: (1) those directly related to the setup and operation of the mini-HDD equipment, and (2) those associated with the proper location, identification and marking procedures intended to avoid contacting and damaging existing utilities. Section 5 of MAB-7 addresses the first category, providing practices to avoid or minimize equipment-related risks during mini-HDD operations. Employees must be trained to prevent injuries to themselves during the operation of the equipment and be prepared to mitigate the effects of accidents. Electric power and gas line strikes are specifically addressed. Although not considered to be hazardous materials, the proper handling and disposal of drilling fluid is also discussed to avoid possible environmental issues.

Regulations and Damage Prevention (Section 6)

Section 6 of MAB-7 addresses the second category of potential safety issues, focusing on procedures to eliminate or reduce hazards associated with damaging existing utilities, including during the initial boring or back-reaming operations. Recommended practices include "call-before-you dig" (811); properly locating and marking existing utilities, as well as exposing such utilities at anticipated crossings with the bore path; avoiding mechanized digging within the required tolerance zone; and the use of Subsurface Utility Engineering, as described in CI/ASCE 38, "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data."

Pipe Design and Selection Considerations (Section 7)

MAB-7 contains a convenient calculation method for the selection of the HDPE (PE4710) pipe strength. The procedure is presented in an easy-to-understand format, appropriate for users with various backgrounds. The procedure provides a means of selecting the pipe strength to avoid collapse due to hydrostatic pressure at the desired placement depth, as well as to withstand the required pulling loads during installation.

Minimum Wall Thickness Based upon Depth

The pipe strength is directly related to the wall thickness that's specified by its dimension ratio, DR, defined as the pipe outer diameter by the wall thickness. The MAB-7 guidelines indicate that all the commonly used wall thicknesses for PE4710 pipe, except for DR 17 pipe, would be sufficiently strong for depths to approximately 15 feet – the typical limit for mini-HDD installations. DR 17 pipe should be limited to less than 10 feet depth, although 15 feet may also be acceptable in some cases. For depths greater than 15 feet, very thin-walled pipe, or special situations, the adequacy of the product for the application should be verified using the supplementary information provided in the document. In some cases, such as very thin-walled pipe and/or relatively large depths, special practices or precautions not typically employed during mini-HDD installations may be required.

Minimum Wall Thickness Based upon Pulling Load

MAB-7 provides the "safe pull tension" for HDPE (PE4710) pipe as a function of pipe (nominal) diameter and wall thickness (DR value) for IPS and DIPS pipe sizes. The following equation has been developed for the purpose of estimating the pull load during mini-HDD installations of polyethylene pipe:

$$\text{Tension (lbs)} = [\text{Bore Length (ft)} \times \text{Buoyant Weight (lbs/ft)} \times (1/3)] \times (1.6)^n$$

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The buoyant weight may be conveniently determined as:

Buoyant Weight (lbs/ft) = ⅛ [Pipe Outer Diameter (in.)]^2 – Pipe Weight (lbs/ft)

The term n is equal to the number (including fractions) of effective 90° bends due to cumulative route curvature, where n = n1 + n2. The quantity n1 is the number of planned (deliberate) 90° route bends, and n2 is the number of effective route bends resulting from typical path corrections and route curvature during the pilot boring operation, for which the following guideline is suggested:

n_2 = [Bore Length (ft) / 500 ft] x [2-in / Rod Diameter (in.)]

For a specified pipe diameter, the procedure for selecting an appropriate pipe strength (DR value) consists of comparing the estimated pull load to the indicated safe pull tensions. This procedure is similar, but much less complicated, than that incorporated in ASTM F1962 for the more sophisticated maxi-HDD installations. The present mini-HDD calculations will generally result in considerably shorter placement distances than that corresponding to the design methodology provided in ASTM F1962, which may result in possible pullback distances of several thousands of feet. Mini-HDD installations suffer relative to those performed using typical maxi-HDD technology due to the lesser degree of control (e.g., greater cumulative route curvature) and the desire to forego the use of anti-buoyancy techniques, such as inserting water into the pipe during pullback, to reduce buoyant weight and significantly reduce required pull loads.

In general, the preceding formulas and methodology are recommended for estimating pull loads for mini-HDD installations. Other methods for determining pulling loads are typically based on well-controlled maxi-HDD installations and not representative of actual mini-HDD applications with respect to anticipated pull loads.

Bore Path Planning and Drill Rig Setup (Section 8)

In comparison to maxi-HDD installations, for which the design of the bore path is typically performed by experienced engineers or organizations, the mini-HDD contractor is generally responsible for cost-effectively accomplishing this task. MAB-7 provides user-friendly drill rig setup and bore path planning information, consistent with meeting the requirements of the project owner, including geographic constraints and placement depth. The ability to satisfy the overall requirements depends on the bending characteristics of the steel drill rods and the drill rig setup parameters.

Figure 3 illustrates a typical mini-HDD bore vertical profile trajectory, including occasional pits along the route. These pits may be required for pipe splicing, completing lateral connections, or to expose existing utilities. The pits may also be useful for collecting drilling fluid from the boring or reaming operations. The bending capability and length of the drill rods, and their entry angle to ground surface, will determine the minimum depth achievable at the beginning of the bore path.

Implementation (Section 9)

It is beyond the scope of the MAB-7 guidelines to provide detailed operational procedures for the various mini-HDD and auxiliary equipment, available from the manufacturers or other sources; however, proper procedures are described for pilot boring, tracking, steering, reaming and pullback operations as well as pipe handling and connection, record keeping.

Completion (Section 10)

Following installation of the pipe, it is necessary to confirm the viability of the new facility, provide a permanent record of the actual placement location, and ensure final site cleanup. The integrity of the pipes should be appropriately verified, depending upon the application, and the owner's specifications.

Appendices (A - F)

The ten main sections outlined above are supported by six appendices which provide examples of the application of the information described in **Sections 7** and **8**, as well as the theoretical basis for their development.

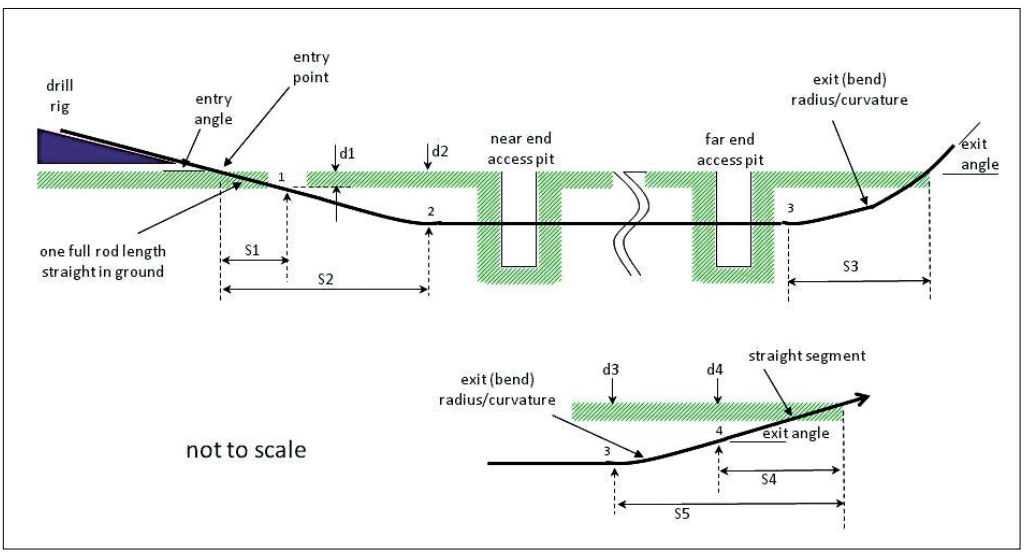

Figure 3. Drill Rig Setup and Related Distances

WHAT YOU NEED TO KNOW ABOUT

THE UPDATED WATER CONSERVATION & EFFICIENCY PROGRAM OPERATION & MANAGEMENT STANDARD (AWWA G480-20)

By Jennifer Shimmin (Vice-Chair, AWWA Standards Committee on Water Conservation Practices)

Throughout North America, water conservation and efficiency programs play an increasingly prominent role for water providers as climate change, rising costs, and environmental and legislative constraints put pressure on water supplies. To contend with these challenges, water providers need assurance that their conservation efforts are meaningful and effective. Some may need guidance on the core components that comprise successful and effective conservation and efficiency programs, and others may need a way to evaluate how their water conservation and efficiency program measures up.

For the past eight years, the ANSI/AWWA G480 Utility Management Standard on Water Conservation and Efficiency Program Operation and Management has offered an industry-standard metric for evaluating programs of all sizes and budgets. The first edition of the standard was issued in 2013, and a revised version of the standard is now available, offering utilities a fresh opportunity to assess their programs. The new edition, AWWA G480-20 (released February 1, 2021) is available from the AWWA Store and including important new provisions relating to metering, water loss control, outdoor water planning and management, and many other areas.

UPDATES TO THE STANDARD

The AWWA G480-20 standard is entirely voluntary and offers a comprehensive set of program measures that utilities can choose to adopt and use to evaluate their own offerings. Utilities may formally adopt AWWA utility management standards and seek to conform to each specific requirement or simply use the standards as guidance. AWWA G480-20 includes the following sections:

- Regulatory requirements
- Top-level organizational functions, such as staffing and planning
- Internal utility actions and requirements, such as metering, billing practices, and nonpromotional rates
- Program components, such as landscape efficiency and transformation, landscape water budgets, and water loss control programs
- External policy requirements, such as water efficiency in building codes and standards
- Specific requirements for wholesale water agencies

In building on the 2013 first edition, AWWA G480-20 includes significant updates and refinements. These include a new section on the integration of water efficiency and land use planning, along with detailed recommendations related to water shortage and drought planning, metering practices, water loss auditing, and audit validation.

VERIFICATION OF COMPLIANCE

The new standard includes a section focused on documentation and verification of conservation and efficiency program compliance. Compliance requires a verification update every five years, which should be made available to the public. It includes transparency and full accountability, which are core components of all AWWA utility management standards.

Utilities may seek an independent review to determine how they measure up to the standard. One way to do this is by working with the Alliance for Water Efficiency (AWE), which offers an independent compliance verification service for its member agencies. AWE uses a compliance checklist, the components of which include utility conservation planning documents, water resources plans, water shortage plans, and more. The AWE G480 Leaderboard recognizes exemplary water utilities that have adopted and complied with the voluntary AWWA G480 Standard and establishes compliance at Bronze, Silver, Gold, and Platinum levels. AWE staff look forward to submissions for review and to get agencies listed on the new leaderboard. Utilities are encouraged to reach out to AWE for the checklist in order to begin the process.

Given the heightened interest in conservation, the AWWA G480-20 Standard will prove helpful for any water provider interested in increasing the level of water conservation and efficiency among its customer base. For more information on the Standard, contact Frank Kurtz at *fkurtz@awwa.org*.

You Work Hard As A Water Professional
We Want To Make Your Job Easier

Our goal is to provide members with the essential resources and water knowledge they need to optimize day-to-day operations and maximize growth opportunities in the profession. AWWA Standards and Manuals, industry reports, and a wide range of education and training options provide the necessary guidance and tools to enhance your operational performance and support your career advancement in the water industry.

Join AWWA today and get access to the people and information you need to advance!

awwa.org

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King County Subsection

The winter season has us still reeling on the excitement of our first in-person event since March 2020: the 25th Annual Charity Golf Tournament. The King County Subsection (KCSS) Board is now planning for the 2022 Training program and annual member appreciation Water Olympics event.

Golf Tournament Success

On behalf of the King County Subsection, PNWS-AWWA membership and Officers, we sincerely thank our sponsors for the 2021 PNWS-AWWA Charity Golf Tournament at the Auburn Golf Course, in Auburn, WA! We at the PNWS-AWWA and King County Subsection are grateful for your presence and support for our membership and cause! Thanks to your support, we were able to donate **$5,500 to the Section's philanthropic efforts within the water industry, including Water For People, the Water Equation and PNWS E&T Fund.**

2022 Water Olympics

Planning is underway for the 2022 KCSS Water Olympics and member appreciation event. The event is being planned for **mid-March** (the official date will be announced in the new year) at the Brightwater Education Center in Woodinville, WA. If you've been to our competitions in the past, you'll know that this is a fun event. With over 70 competition participants, sponsors and audience showing up to support their colleagues, you're guaranteed to have a good time.

Now is the time to start getting a team together for Meter Madness, Hydrant Hysteria, and Best Tasting Water! If you're interested in a practice hydrant or meter, or interested in sponsoring the event, contact King County's PNWS-AWWA's Competitions Coordinator Ted Stonebridge at *ted.stonebridge@bothellwa.gov*. We look forward to seeing you there.

New Members

Welcome 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. Join us at one of our monthly meetings, scheduled every third Wednesday of the month, to learn more. If you are interested in attending any of these meetings, contact the Subsection's Secretary, Jon Miner, at *jon.miner@murraysmith.us*.

Welcome New Members: Fall 2021 – Winter 2022

- Yu Jung Chang
- Tyler Chatriand
- Steven Moore
- Emily Rabe
- Kyle Rohner
- Redman Svedberg

Training

The Subsection is committed to offering classes to help our members meet their CEU requirements. The Board's goal is to offer a minimum of four classes within the calendar year. Planning is underway for the 2022 technical program with virtual and in-person classes. Look out for further announcements and registration information. For questions related to classes, whether it's an idea for a class or suggestion for a guest speaker, or general information about training and CEUs, please contact our Program Director Jim Konigsfeld at *jim.konigsfeld@spwater.org* or 425-295-3217.

KCSS Board Transitions and Recruitment

The fall season came with some transitions within the KCSS leadership. Please welcome our new Associate Program Director 1, Bella Graves, from Murraysmith.

The Subsection is still looking to fill one additional role for 2022-23:

- **Webmaster**: 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 contact Subsection President Joanie Stultz, *jstultz@brwncald.com*, if you are interested in the webmaster role.

Thank You

Tammy Whipple officially left the Board this fall, to focus on her several other national AWWA Board commitments. We will miss Tammy's leadership! Tammy served initially as the Board Treasurer in 2017, followed by two years in the Associate Program Director role. Tammy helped develop new standard templates for training event planning and coordinated CEUs for classes – among many other contributions to the Board. Thank you, Tammy, for your service!

Northwest Washington Subsection

Happy Holidays from all of us at the Northwest Washington (NWWA) Subsection of PNWS-AWWA! As we enter this busy holiday season, we would like to take a moment to pause and express our sincere gratitude for our volunteers and members.

The COVID-19 pandemic interrupted life at work and home in numerous ways, big and small, yet our volunteers and members continued to show up and serve. In 2021, we were able to provide nine virtual workshops and our first ever virtual Western Washington Short School & Trade Show, allowing our members to gain valuable knowledge and earn CEUs. We had the pleasure of collaborating with the Central Washington and King County Subsections, the PNWS Training and Coordination Committee, and the Pacific Northwest Clean Water Association (PNCWA).

While we all miss the camaraderie and connection our in-person events and workshops provide, we are thankful for the technology that allowed us to continue to provide high-quality and affordable training to our members. Thank you to everyone who attended or volunteered their time to make these training opportunities a success and we look forward to connecting in-person next year. As we continue to weather this pandemic, let us be fortunate enough to remember the lessons that it has taught us so that we can continue to strive towards a better tomorrow.

New Members

If you are a new member to the NWWA Subsection, we would love to connect with you. Please reach out to our Vice President and New Member Chair, Kenneth Packard at *kenneth.packard@hdrinc.com.*

> As we continue to weather this pandemic, let us be fortunate enough to remember the lessons that it has taught us so that we can continue to strive towards a better tomorrow.

Training

The NWWA Subsection is committed to further the dissemination of information and the advancement of knowledge in the areas of design, construction, operation, and management of utilities rendering water service to the public. We have a full slate of training opportunities lined up for 2022, including:

- Water Distribution
- Chlorine Residual Testing
- Reverse Osmosis
- Groundwater Basics
- Day with Department of Health
- Chemistry for Operators
- Water Storage Basics
- Basic Waterworks
- Emergency Preparedness
- Math for Operators
- How to Read Process and Instrumentation Diagrams
- 2022 Western Washington Short School & Trade Show

The complete training schedule will be posted to the PNWS Section's website at *www.pnws-awwa.org/training/training-opportunities* and shared via Constant Contact. For training related questions, please contact our Program Co-Chairs Jeff Lundt, *jeff.lundt@kingcounty.gov*, and Eric Schey, *eschey@kingcounty.gov.*

Events

While the COVID-19 pandemic forced us to postpone events in 2021, we are looking forward to hosting in-person events in 2022 including competitions (e.g., Best Tasting Water, Meter Madness, Hydrant Hysteria, Top Ops, etc.) philanthropic events, facility tours and networking events. The complete event schedule will be posted to our Subsection's website and shared via Constant Contact. For event related questions, please contact our Subsection's Secretary, Bridget August at *baugust@geoengineers.com.*

Monthly Meetings

The NWWA Subsection holds monthly virtual meetings, and we would love to "see" you there! To be added to the monthly meeting invite, please contact our Subsection's Secretary, Bridget August at *baugust@geoengineers.com.*

South Sound Subsection

The end of 2021 marks the close of the professional growth reporting period for certified Washington Waterworks Operators. To support water professionals needing end-of-year credits, the South Sound (SS) Subsection offered two workshops: Water Systems Analyzers and Asset Management.

Next year is shaping to be the 'come back year' for in-person events. Our Subsection volunteers are enthusiastically planning several events to raise money for local causes, including Water For People. Mark your calendar for March 25, 2022: the SS Subsection's Best Tasting Water + Meter Madness contests. This event will take place at Dystopian State Brewing in Tacoma — a spacious atmosphere that's ideal for easing people back into in-person events.

Next, plan to golf with us at the SS Golf Tournament on July 22, 2022, at Oakbrook Golf Course in Lakewood. This course is known for its firm, smooth and fast greens, so get ready to show off your putting skills this summer.

Please visit our webpage closer to each event date, where we'll post exact times and more details: *www.pnws-awwa.org/member-groups/subsections/washington-south-sound-subsection.*

Can't wait? We appreciate your eagerness! Please email Jolene Gibson at *jgibson2@cityoftacoma.org* with your question or interest in participating and we'll get you the details you need.

For the holidays, please remember to continue with safe gatherings, to keep you and your loved ones healthy and ensure we can come back together in 2022. We cannot wait to see you soon.

Inland Empire Subsection

BiJay Adams is chairing the Inland Empire Subsection (IESS)'s annual Truck Rodeo on March 9, 2022, at Center Place in Spokane Valley. He's planning a hybrid format this year, for those that cannot safely attend in person. The Board purchased a new accessory, the OWL, to use during in-person classes are connected to Zoom. Travel restrictions are still in place for some utilities and agencies (and may be for a while yet), so we've delved into uncomfortable territories and learned how to do webinar settings. Our first endeavor was last year's Truck Rodeo, chaired by Michelle Johnson. We were pleased to still provide an annual tradition – after that, there were three more Zoom classes that worked in our favor. One of the presenters was supposed to come to Spokane, but was not feeling well; therefore, presented virtually from his hometown in Portland, OR. So, there are some benefits to this new technology and we're continually learning to embrace it.

In a recent survey, our membership stated that they miss the networking aspects, so we're hoping the majority will opt for in-person attendance at the Truck Rodeo. We've also found that people prefer shorter meetings if they're attending on Zoom. Three hours of education with breaks is perfect, four hours with breaks is stretching it, and no one wants to be online via Zoom all day. (Last year, we conducted our Truck Rodeo via two morning sessions, instead of a full day, which was well received.)

We miss doing our *No Water No Beer* fundraiser, but there are still too many unknowns; this fall, COVID case numbers spiked up again. This summer, we were lucky to host our Golf Tournament at a time when restrictions eased and we were able to raise funds for the IESS Scholarship. Doug Schlepp and Cheryl Capron joined us as Section representatives at the event.

We've closed the year with two great classes – one on wells, and the other on storage tanks – and are now brainstorming topics for spring.

We're also happy to announce we will be having contests back at our Truck Rodeo, including Meter Madness, Hydrant Hysteria, Best Tasting Water, and possibly Tapping and Top Ops.

We're excited for the Tacoma Conference and even more excited to see people in person!

We lost a former IESS member, Lynn Shupe, who worked for 43 years with the City of Spokane Water Department. He was a great mentor, teacher, and strong supporter of IESS and will be missed by all.

If you have any questions or comments, please contact IESS President Bob Cunningham at *bobecon_@hotmail.com.*

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NORTH CITY/DENNY CLOUSE PUMP STATION
A 10 YEAR SUCCESS STORY

BHC CONSULTANTS was the prime consultant for the design and construction of the North City/Denny Clouse Pump Station. The largest and most complex facility within the North City Water District is located in Shoreline, WA, just North of downtown Seattle. The Station provides water to three distinct pressure zones and includes numerous components that are designed to improve water quality, system reliability, and redundancy. The staff are capable of monitoring and controlling the entire District water system from this one facility with a layout that provides direct access to all equipment.

This facility was a ten-year labor of love for the District and its staff. Every detail was discussed and deliberated on how to create the most efficient design possible. Denny Clouse led the project to such an extent that the Pump Station was named after him – a fact he knew nothing about until the ribbon cutting ceremony. On November 19, 2021, Denny officially retired after a forty-one-year distinguished career in the water industry and many years of service to the PNW-AWWA Section. In addition to being Section Chair in 2006, he has also been the recipient of the *PNWS Powell Lindsay Award* and *George Fuller Award*. We wish Denny all the best in retirement!

Please read on for a little more information on the Station named after him.

FUNCTIONAL

The District wanted something the neighbors wouldn't hate, that could control much of the system from one spot, and would last without high maintenance costs. The Station contains the workings of eight different facilities and structures into a single facility and, while architecturally appealing, the structure uses commonly available CMU walls, a steel framed roof, and a metal roof – producing a very effective life cycle cost.

As for the goal of creating an operational command center, the Station serves the 615,590, 502 pressure zones directly, and meets 16 Functional Objectives, including:

- domestic and fire flow water demands within the 615,590, and 502 pressure zones,
- water turnover in the 590 Reservoir to improve water quality,
- pressure relief from the 615 and 502 zones to prevent damage to customer fixtures,
- access to previously dead storage in the reservoir to provide greater reliability,
- supplemental fire flow to provide greater protection to the general public,
- ability to isolate the reservoir for maintenance and cleaning without sacrificing service to customers, and
- provide redundancy and reliability to customers when sources of supply are out of service.

RESILIENT

The District was also mindful of emergency preparedness; therefore, designed the system components to maximize the usefulness of the station during normal and unusual and emergency conditions. Pressure relief valves and surge tanks protect the water system and the public from high and low pressures, and a seismic control valve retains water in the reservoir in the event of a significant earthquake. The station includes a public tap that allows the District to provide water directly to the public from the reservoir, following a major earthquake. This tap is in addition to the industry standard features that will give the District the best chance at limiting service disruptions and allowing adequate water for fire flow, following an event.

SUSTAINABLE

The District wanted to be a good neighbor and steward of resources and set aggressive goals for sustainability and environmental stewardship. The Station incorporates low impact development features, extensive landscaping, and sound attenuation of the generator and pumps to achieve compatibility with the surrounding environment. Various features – including provisions to recirculate water for testing, permeable pavers, and a tree retention plan – are incorporated to promote sustainable use of a precious water supply. To reduce energy usage, the Station has translucent panels to make effective use of natural lighting and all pumps use variable frequency drives – allowing the District to closely match pumping rates with system demand. Since many of these features are valuable but unseen, the District also had the above ground reservoir repainted as part of the project to better blend in to the surroundings. To date, the response from adjacent properties has been very positive and another marker of success for the project.

BHC Consultants, LLC has very much enjoyed working with Denny and the North City Water District for the past 15 years. BHC is an employee-owned and managed professional services consulting firm providing municipal engineering, community and regional planning, and code compliance services from offices in Seattle, Tacoma, Bellingham, and Spokane.

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Revised 12/15/2021

CATEGORIES

Welcome to the annual *Water Matters* Buyers' Guide.
When making purchasing decisions about products and services in the water industry throughout Washington, Oregon, Idaho and beyond, please support the companies whose advertising makes Water Matters possible.

You will find them quickly with our convenient, easy to use Buyers' Guide

On these pages, you will find information that will help you meet your purchasing requirements throughout the year ahead. The initial section of this Guide lists categories of products and services along with the various companies that can provide them to you. The following section provides an alphabetical listing of those companies as well as the contact information you will need to reach them.

ACTIVATED CARBON
CEI – Carbon Enterprises, Inc.

AMR Systems and Meters/AMI Solutions
Neptune Technology Group, Inc.
SUEZ Advanced Solutions (Utility Service Co.)

Anaerobic Gas Safety Equipment
Force Flow

Asset Management
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SUEZ Advanced Solutions (Utility Service Co.)
SYBIS LLC (CyberLock)

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Chemical Processing & Feed Systems
Blue-White Industries
Hasa, Inc.

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Force Flow

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Induron Protective Coatings
SUEZ Advanced Solutions (Utility Service Co.)

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Owen Equipment Company
SYBIS, LLC (CyberLock)

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VEGA Americas, Inc.

Dechorination
Blue-White Industries

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Tesco Controls, Inc.

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Neptune Technology Group, Inc.

Meter Reading Systems
Badger Meter
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Synagro Technologies, Inc.

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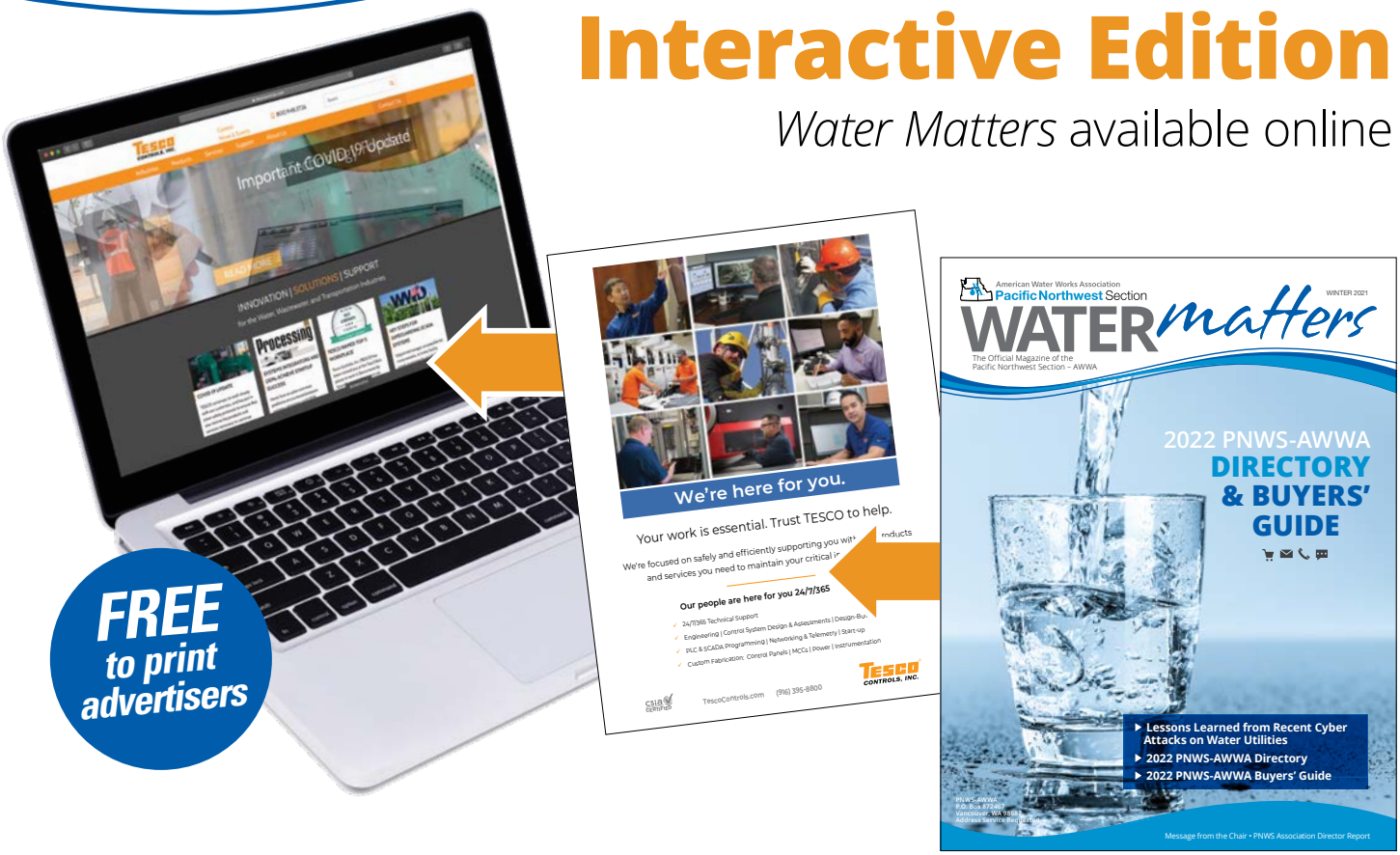

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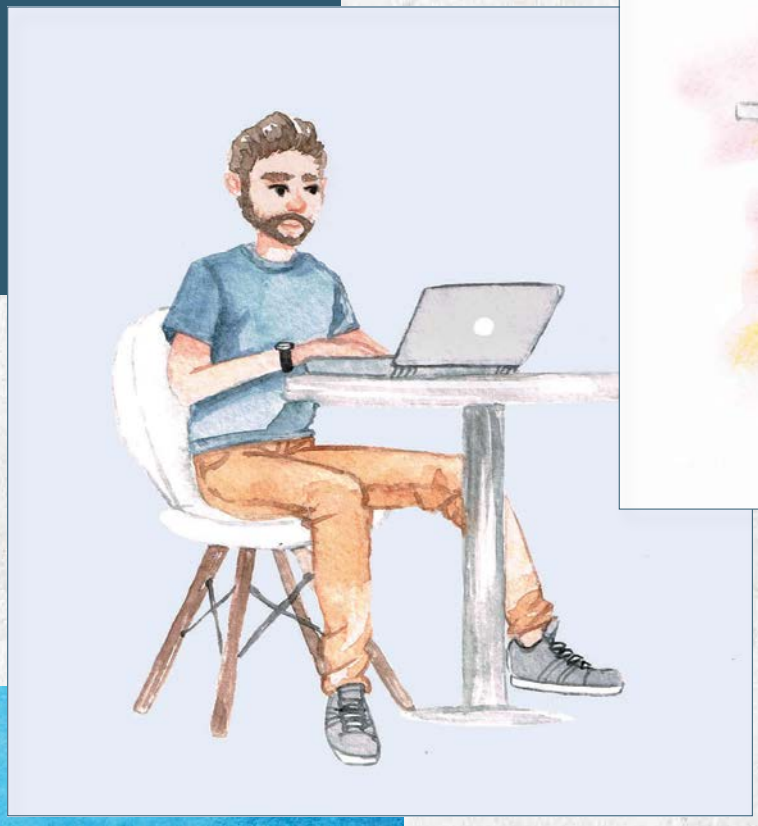

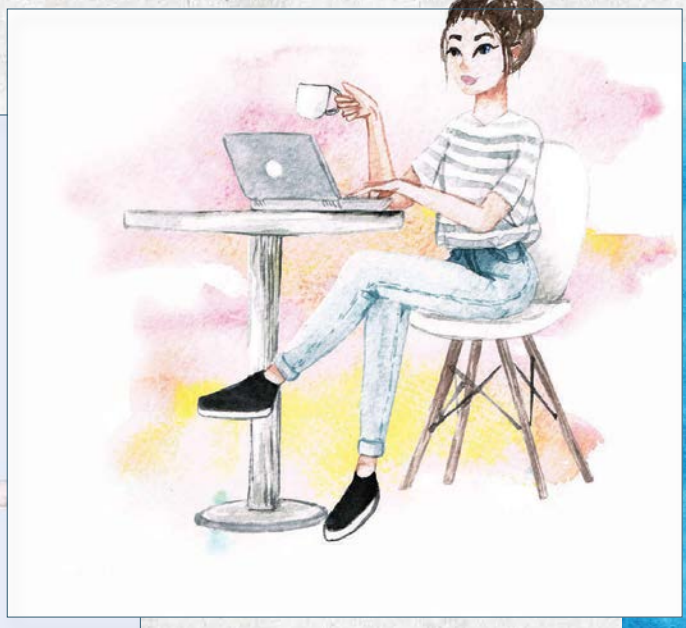

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