

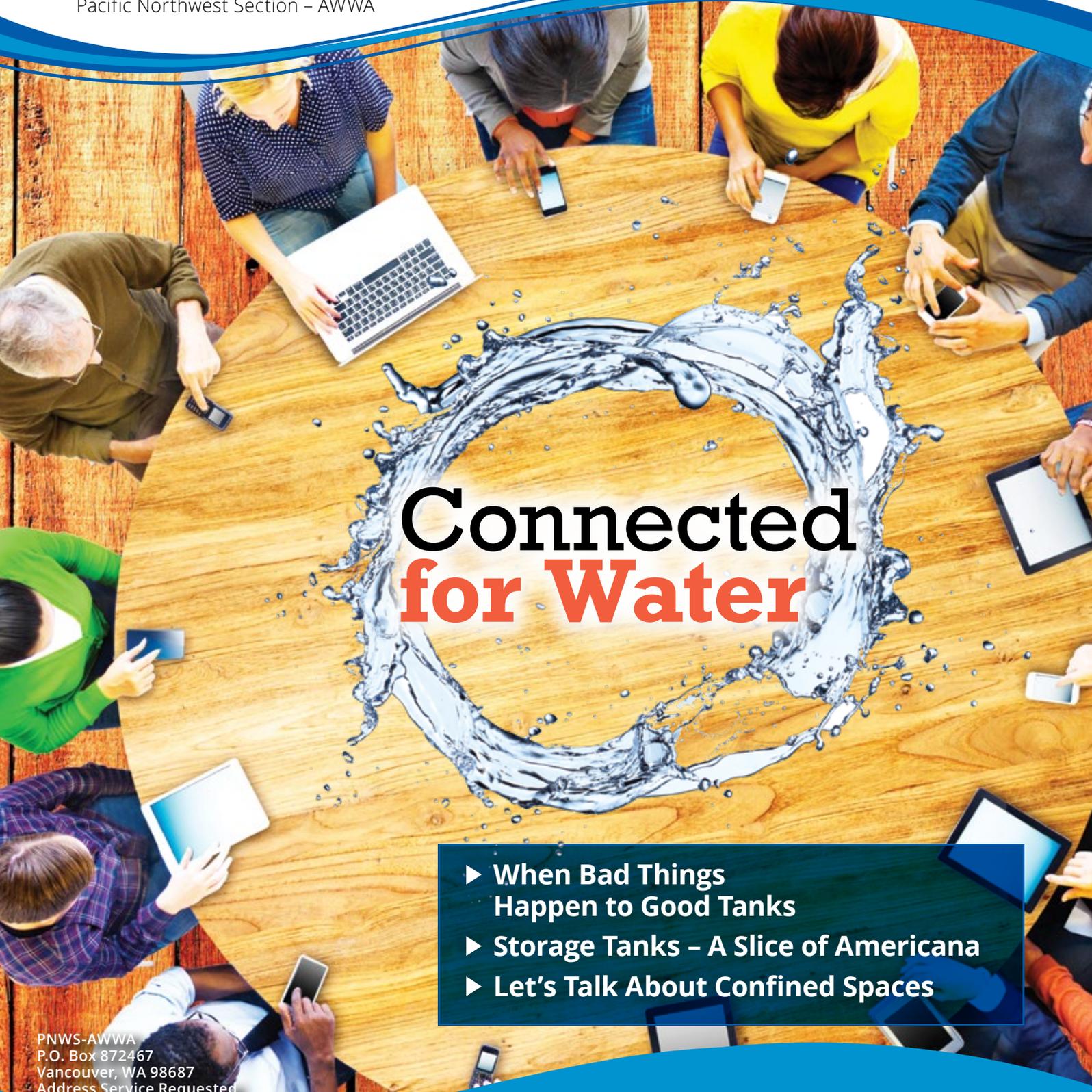


American Water Works Association
Pacific Northwest Section

SUMMER 2021

WATER *matters*

The Official Magazine of the
Pacific Northwest Section – AWWA



Connected for Water

- ▶ When Bad Things Happen to Good Tanks
- ▶ Storage Tanks – A Slice of Americana
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Message from the Chair • PNWS Association Director Report



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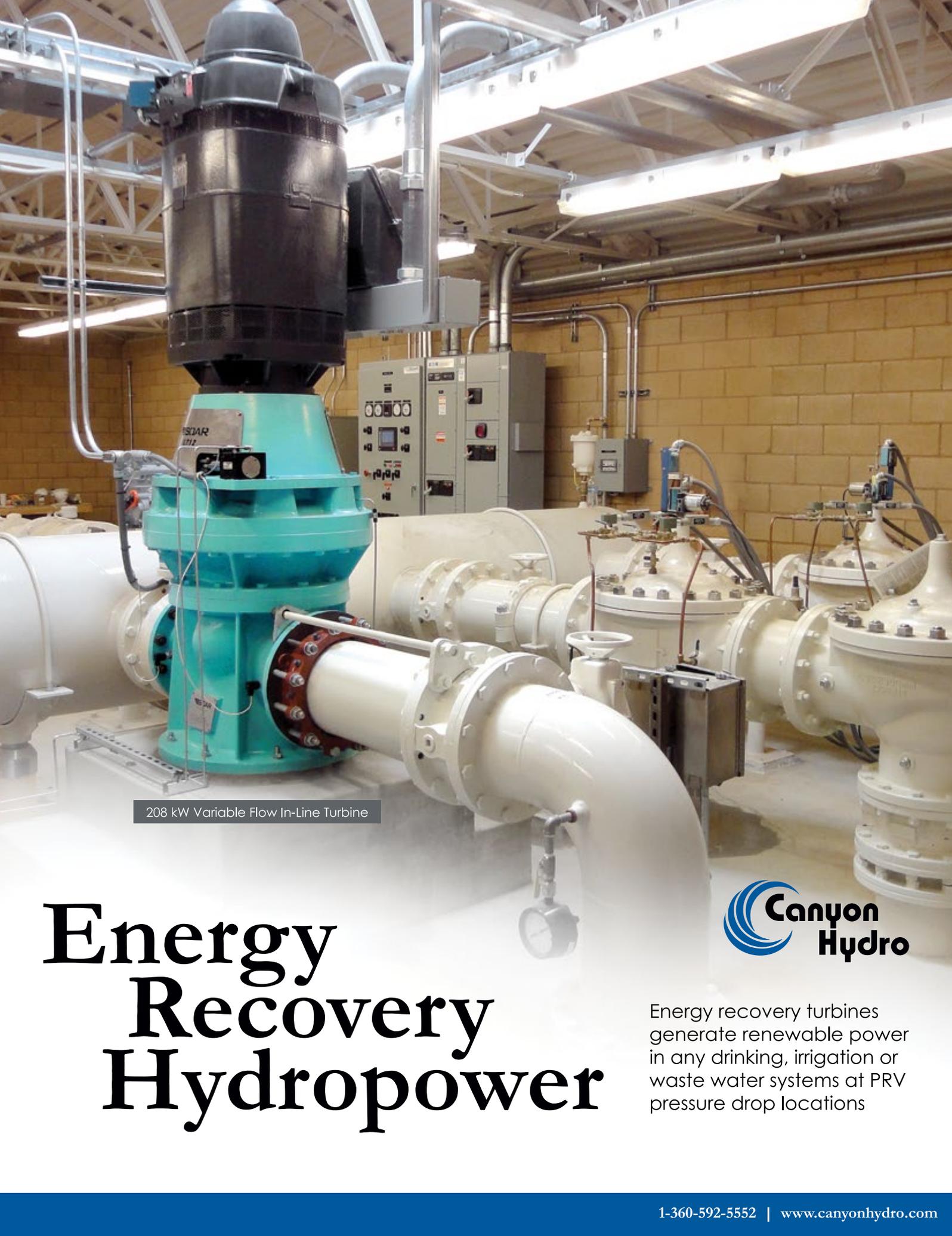
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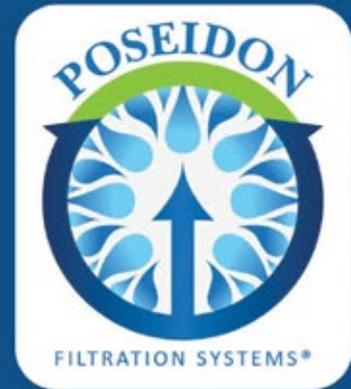
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PUTTING THE “PRO” IN PROJECT MANAGEMENT

WHAT DOES PROJECT MANAGEMENT MEAN TO YOU?

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True to our Mission and Vision

I am honored and excited to lead the Section in our next chapter and into 2021. The COVID pandemic has been difficult – especially for the leadership in the Section – and I am very grateful to the Board, Ronda, and Kyle for keeping us responsive to our members needs and conducting our business. In the coming year, I hope that we can return to a more in-person format – spending time with our friends and colleagues is motivational and inspirational. At our conferences, there has always been a certain energy and refreshment of our purpose. Unfortunately, we had to cancel two conferences (so far), but I hope we will be back in person next year.

The desire to advocate for our membership, do great things in the Section, and be leaders in our industry is something we can all be proud of. It is important, and I'd say critical, that we – as a member's organization – are responsive to our members and adaptive with circumstances. COVID has highlighted that responsiveness and adaptability in our Section; meanwhile, has exposed areas we can improve on.

It has been a challenge to provide a high level of service during this time. At the PNWS, our **vision** is to be the trusted resource for water professionals and **mission** is to foster a network of professionals by providing opportunities and leadership to the water industry. Over this next year, I hope to rededicate ourselves to this mission and vision.

I am forming an ad hoc committee to review and update our Rules of Procedure (ROP). The new Bylaws were adopted at the Board meeting in May (it is customary to review the ROPs for parity). Next, we will



look at our business practices, roles and responsibilities to ensure that in the event of a transition event or "pandemic," the Association can adapt. The Section Board will be heavily involved with this update.

The ROP update will help build leadership capacity for this and future Boards to follow. As leaders of the Section and Board, it is our responsibility to provide opportunities for leadership to grow – exactly what our mission statement says.

To embrace this responsibility and fulfill that promise is important for our current leaders to understand: that our organizational structure, roles, and responsibilities are providing those opportunities. My goal is to inform all members how we do our business and show how we measure our performance within the organization.

By way of example, things as simple as writing a report or facilitating a presentation allow subject matter experts the chance to communicate how they are advancing our mission. Simple key performance

indicators – membership data, attendance at functions, and budget expenditure reports – can inform us all on the value of our effort as an Association.

An engaged and informed governing body is key to a healthy, robust, and responsive organization. It is also extremely important to foster the diverse backgrounds, perspectives and experiences of our members. By embracing our diversity, we will minimize blind spots and be more responsive to our stakeholders.

All of these ideas and aspirations come full circle and can only be realized if we get involved. Our volunteers are the heart and soul of the Association; I encourage you all to participate in our Section and encourage your peers, colleagues, friends, and co-workers to do the same.

Thank you for this opportunity and know you are valued by our Section. 

John Roth
PNWS Section Chair



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Supporting One Another

By the time you read this article, the ACE21 All Virtual Conference has occurred and was a very different experience for all of us because, in my opinion, nothing can replace an in-person conference; however, I can assure you that the AWWA worked exhaustingly to ensure this year's event mimicked the experience of a face-to-face ACE Conference. The Association ensured that ACE21 offered 80 hours of technical sessions that were innovative, current, and taught by subject-matter experts in the field; attendees connected with other attendees, session partners and sponsors; and sponsors connected with utilities. This year's event also hosted the gavel passing celebration, where President Mellissa Elliot passed the gavel to the new AWWA President Dr. Chi Ho Sham. ACE21 All Virtual will be available for on-demand viewing – please watch out for ACE21 communications, with a link to view the event, in your inbox.

Let us hope that our country successfully continues to limit the spread of COVID so that we can see each other in person once again. On that note, please mark your calendars for ACE22, scheduled from June 12-15 in San Antonio, TX, where we can see each other once again and get reacquainted.

Recently, AWWA's Government Affairs put forward information regarding funding opportunities for water utilities, called the *Water Infrastructure Finance and Innovation Act* (WIFIA), that became law in 2014.

The American Water Works Association has been supporting this Act from beginning through its sponsored annual Water Matters Fly-In, where AWWA representatives from

each state meet with congressional delegates from their state to champion important legislation impacting the water sector.

Since 2014, utilities have been slow in taking advantage of WIFIA. In recent times, this trend seems to be reversed but there are still too many missed opportunities for drinking water funding through WIFIA loans. Drinking water systems will send in a letter of interest but then drop out of the running for reasons that are still unclear. WIFIA is a federal credit program that provides long-term, low-cost loans with fixed interest rates to creditworthy utilities. The program offers an extended repayment term of up to 35 years from completion of construction (usually five more years), deferred interest, and "sculpted" rates to match revenues with utility expenditures over the life of the loan. Other features, such as the "drawdown" and prepayment, enhance its attractiveness. It is also a great deal for the taxpayer. The WIFIA portfolio of loans generates US\$100 of infrastructure spending for every \$1 appropriated to the program by Congress.

WIFIA loans finance up to 49% of approved projects, thereby stimulating other investments from tax-exempt bonds, state revolving funds (SRFs), or private equity. In 2021 alone, WIFIA will be able to lend approximately \$5 billion. WIFIA is managed by the U.S. Environmental Protection Agency (USEPA) which has done an outstanding job with setting up this new finance program. To date, it has closed on 49 loans: totaling \$9.3 billion (as of April 2021) to finance systems serving 31 million Americans.

Various projects are eligible for WIFIA funding (www.epa.gov/wifia),

including the usual suspects such as treatment, storage, consolidation, water security, energy efficiency, and many more. Basically, anything eligible under either the Clean Water Act or Safe Drinking Water Act SRFs is fair game if the applicant is a public water system. Further, WIFIA loans fund not only projects but ongoing programs such as lead service line and distribution system replacements – two areas of particular interest to drinking water utilities. While WIFIA has yet to fund a land-based source water protection project at scale, there is no reason a utility could not fund protection of a headwaters forest or deployment of easements and management practices on agricultural lands to protect the utility's reservoir or other source water.

USEPA's Office of Groundwater and Drinking Water has identified

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Since 2014, utilities have been slow in taking advantage of WIFIA. In recent times, this trend seems to be reversed but there are still too many missed opportunities for drinking water funding through WIFIA loans.

a 200-year average cycle for replacement of distribution lines in the water sector. While one does not automatically replace, say, a 100-year-old line, postponing renewal for two or three centuries is not an asset management model that utilities should practice. Utilities often pay for distribution line renewals from their operating revenue on a pay-as-you-go basis rather than using debt financing with the cost spread over multiple years. WIFIA offers a means of getting ahead of the curve and reducing risk for current and future generations.

Drinking water utilities' general managers and chief financial officers should consult USEPA on the myriad of benefits of WIFIA which are outlined on their website as follows:

- Very low interest rates – e.g., Treasury rates of the equivalent maturity based on weighted average.
- Extremely flexible repayment schedules during construction with deferrals allowed during periods of high capital spending.
- Preservation of borrowers' senior debt capacity – e.g., permitting borrowers to issue future non-WIFIA project-related debt at lower interest rates and more favorable terms.
- Flexibility to "sculpt" the repayment schedule to reduce burden on ratepayers; in other words, scaling up repayments over time to allow for small and steady rate increases to accommodate capital expenditures and debt service payments.
- Backloading repayments to provide significant savings compared with

level repayment schedules since cash outlays made sooner cost more than outlays in future years as a result of lost earning capacity on that cash funding wastewater, community case studies (CSO), and reuse projects is important and will continue to be a big part of the WIFIA program. It would be ironic if drinking water utilities did not take advantage of this marvelous program that AWWA labored so hard to generate, fund, and protect over the past decade. WIFIA and drinking water utilities should not be strangers to each other.

Wishing all of you a great spring and wonderful summer! 🌞

Randy Black
PNWS-AWWA Director
and Vice President

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Women in Leadership Committee

After seven years of successful networking symposiums, and on the heels of a sold-out 2020 event with 160 women, the Women in Leadership (WIL) Committee was looking forward to our 2021 event. What we didn't know was how we were going to adapt to the new COVID world.

After many virtual meetings, the Committee took a deep breath and jumped into the virtual world of conferences. **Maintaining Connections, Thriving Through Change** was the theme of the virtual networking event, held from 4:30-6:00 p.m. on Wednesday, February 10, 2021. 112 women registered for the event and 70 women ultimately joined in. The event kicked off with a montage video of past speakers, who celebrated the last seven years of symposiums and highlighted how they have adapted to the virtual world and maintained their connections, then facilitated two networking sessions across 10 Zoom



break-out rooms – each moderated by a WIL Committee member.

WIL was supported by Warr-King wines – who generously provided a discount on wines for registrants – and Wellington Chocolates, by Chocolatier Julie Berg, that were included with

the purchase of wines. The event concluded with a fun virtual wine-tasting hosted by Lisa Warr-King Packer, Owner/Winemaker of Warr-King wines.

We look forward to seeing everyone in person next year! 🍷

Utility Management Committee

Call for Abstracts

Our next one-day conference is scheduled for **January 2022**, with plans to be held on-site and online. We invite participation from managers, supervisors, and industry leaders seeking to step into these roles.

Conference theme: **Financial and Workforce Sustainability**

Proposed topics include:

- **Budgeting, rate setting, and recovering from the pandemic**
- **Finance and the new federal infrastructure act**
- **Staff leadership development**
- **Knowledge transfer and cross-training**

Submit your abstract by July 31, 2021, to kreid@pnws-awwa.org. In your submission, please include your contact email, name of organization, the title of your presentation, and a brief description of the content. We are especially interested in an interactive



workshop segment and will provide time for the active exchange of ideas. Come ready to participate!

Utility Management Committee (UMC) meetings – held on the third Thursday of the month at 9:00 a.m. – provide a forum for discussion of problems and solutions. Recent topics include asset management platforms and GIS, supporting staff and the

work routine during the pandemic; emergency preparedness and the impact of the winter storm in February; operator retention and development. To join us, contact chris.guest@covingtonwater.com.

For more information about the UMC and Women in Leadership and Public Officials Subcommittees, contact kim.reid@veolia.com. 📧

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Engineering Committee

Do you like to learn or have something to share about advances in water industry planning, design, and project delivery? Connect with the Engineering Committee! We concentrate on education, training, and promotion of engineering in the drinking water industry.

Excellence in Engineering

We will be collecting entries for the *2022 Excellence in Engineering Awards* sooner than usual and due to 2020 'issues,' we are extending the allowable completion window to any project completed between 2018 and 2021. The Engineering Committee will begin accepting nominations on September 1, 2021, within the following categories:

- Large Engineering Works (construction value greater than \$5,000,000)
- Small Engineer Works (construction value less than or equal to \$5,000,000)
- Engineering Planning

Start thinking of projects that people need to hear about and, in September, look for announcements soliciting nominations.

Tours/Training

We are excited to get to project sites again. If you have a tour or training idea, please connect with one of the officers or join our next meeting to discuss the idea and hear about others in process. We meet the third Wednesday of each month, from noon – 1 p.m., over Microsoft Teams and any officer can forward you an invite.

New Officers

Jason Branstetter – Past Chair City of Gresham

1333 NW Eastman Parkway
Gresham, Oregon 97030
503-618-2516
jason.branstetter@greshamoregon.gov

Joelle Bennett – Chair Tualatin Valley Water District

1850 SW 170th Avenue
Beaverton, OR 97003
503-941-4577
joelle.bennett@tvwd.org

Nicholas Augustus – Vice Chair Tualatin Valley Water District

1850 SW 170th Avenue
Beaverton, OR 97003
971-327-6292
nick.augustus@tvwd.org

Taylor Stockton – Secretary RH2 Engineering

5335 Meadows Rd, Suite 420
Lake Oswego, OR 97035
503-278-5356
tstockton@rh2.com

Oregon Water/Wastewater Agency Response Network (ORWARN) Committee

ORWARN Conference – October 20-22, 2021

We are excited to gather folks together for our in-person 2021 Conference. Save the date and join us on October 20-22, 2021, at Agate Beach in beautiful Newport, OR. The Conference Organizing Committee anticipates that water and wastewater CEUs will be awarded for Oregon. We look forward to seeing you there!

ORWARN Website

A friendly reminder to keep your organization's information up to date on the website. If you need help logging in or have questions, please email info@orwarn.org and one of our Board members will help you.

Membership

ORWARN's membership continues to grow; we now stand at 158 members and Associate members. If you know of a utility that is not currently a member of ORWARN, please direct them to info@orwarn.org for more information.



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Honored to Serve Our Section

By James Dean, City of Yakima, james.dean@yakimawa.gov

As I look back and reflect over the past year and a half, I am filled with pride and appreciation to be associated with and for the members of the Pacific Northwest Section. Undoubtedly each of us have been touched, changed and challenged in unimaginable ways over the past few months. The challenges of working altered shifts or remotely finding new ways to communicate and serve customers, yet while still maintaining our water and wastewater systems at the highest level, has been difficult and challenging. Today, we also have a heightened awareness on diversity and inclusion with those that we serve and amongst ourselves as members.

I am extremely proud to be a member of this Section and its continued commitment to excellence. This commitment has never been more evident than over the past year, with everyone's willingness to adapt and embrace the changes that have been presented. A willing attitude to embrace change is key to furthering relationships and developing leadership skills – both professionally and personally.



I have had the honor of serving all of you as a member of the Board of Trustees, over the past five years: it has been a humbling experience and a true honor. I encourage each of you to step outside of your comfort zone and build a network that you will find to be an invaluable resource throughout your career.

One of the best ways to build that network is thru the many volunteer avenues offered within the Section. Whether that be serving on a committee, serving on your local

Subsection level or seeking to serve on the Board of Trustees, the life-long friendships and mentorships you gain will be incredible.

Embracing the opportunity to work with persons of diverse personalities, backgrounds and skill sets will present many untapped resources and opportunities for growth and learning. In closing, I am so appreciative of each of you, your commitment to the Pacific Northwest Section, and for allowing me the opportunity to serve you and our Section. 



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When Bad Things Happen to Good Tanks

The warning signs were there. The fire protection tank looked OK at first glance. The shell of the steel exterior appeared to be in decent shape. Sure, it could stand to be power washed and spiffed up with a new coat of paint – but nothing too out of the ordinary. It was upon closer inspection that it was apparent the tank needed emergency attention. Or else something drastic might happen. Something like the tank rupturing, spilling its entire contents and becoming little more than a twisted scrap heap. That's something that did happen to a storage tank last year.

About five years ago, a company ordered routine inspections for a pair of fire protection tanks. The inspectors noted several deficiencies in their reports, along with recommendations on how to repair the tanks to ensure their structural integrity. The rusty vents had broken screens, allowing animals and contaminants entry points to both tanks. One of the tanks had water collecting on the roof, speeding up deterioration.

Inside the first tank, the steel had thinned, and the floor was rough. The old steel needed replacing and patching up. Both tanks also needed to be sandblasted and repainted. However, the necessary repairs were never made. The first tank continued to deteriorate until it ruptured and failed. The tank's twin was taken out of service for safety concerns since its owners were afraid it would also rupture.

Had the tank's maintenance not been neglected, they would likely both still be standing and functional. As it is, the company is now down a pair of tanks – which usually run several hundred thousand if not millions of dollars to replace.

Roof deteriorated from ponding



Interior coat



Tank failure

“Over time, the steel will rust and corrode. Fresh paint helps protect the steel from rusting – plus it just makes it look better.”

Storage tanks, like most things, need a little care and attention from time to time. A well-maintained brick house can last a century or more, but the home's components will not last as long. Similarly, a steel tank can also be functional for 100 years if cared for, but the paint jobs and vents will need replacing sooner. A house's roof will likely need replacing after 20 to 50 years, while new windows might be necessary after 10 to 30 years.

Potable water should be clean, uncontaminated water. Remember the scene in *Erin Brockovich* where the lawyers are negotiating a settlement for a class-action lawsuit about groundwater contamination involving PG&E and claimants who lived in Hinkley, California. A lawyer representing PG&E is about to take a drink but pauses and sets aside her glass when she is told the water was from Hinkley. Or think about the Flint, Michigan water crisis. Seven years after it began, there are Flint residents who are still without access to clean water, and many more who are dealing with the consequences of a contaminated water supply.

There are many ways in which water stored in a tank can become polluted. Some of the most common are animal and windborne contaminants that can find their way inside a storage tank through openings. The best way to keep these contaminants out is to make sure potential entryways are not open.

For instance, an overflow pipe has an opening that, if uncovered, can allow bugs, animals, and contaminants through. To keep them out, a screen and a flapper valve should be installed per AWWA D-100-11 7.3. Overflows are designed to prevent tanks from overpressure and overload.

Vents also help with pressurization. An improperly vented tank may cause external pressure to act on the tank, which can cause buckling even at a low-pressure differential. To get optimal performance out of a vent, install a vent that is both frost-proof and pressure-proof. The screen should also be intact and corrosion resistant to help keep out critters and contaminants. If the screen is rusty or broken, it should be replaced immediately.

No matter if it's for a house or a storage tank, paint helps protect a structure from the elements. Storage tank exteriors are exposed to sun, wind, rains, sleet, snow, and in some climates, sand. All these elements can cause wear and tear on steel. Over time, the steel will rust and corrode. Fresh paint helps protect the steel from rusting – plus it just makes it look better.

Water ponding on the roof can cause the paint and metal to deteriorate. After cleaning out the ponding, a commercial epoxy adhesive filler can be applied, as needed, to prevent any further water ponding.

“Addressing potential warning signs can help keep a good tank from going bad – from tank failure.”

Steel that interacts with water corrodes over time. Rust tends to form on the roof lap seams or crevices between the roof and rim angle. Installing interior lining helps prevent water storage tanks from rusting. Tank interiors should also be routinely painted. What type of paint and what kind of coat is needed depends on the condition of the existing paint coat, along with the severity of the rust present.

During each inspection, a professional inspector should perform UT and MIL testing. The original blueprints can be used to compare the tank’s original steel thickness to its current steel thickness. If steel is too thin in spots, that does not mean the entire tank has to be scrapped. Steel plates can be patched into place to restore the steel thickness.

Addressing potential warning signs, like rusted paint or a faulty vent, can help keep a good tank from going bad – from tank failure. A little effort and maintenance can go a long way. 

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STORAGE TANKS

A SLICE OF AMERICANA

By Erin Schmitt, Technical Writer and
Media Director for Pittsburg Tank & Tower Group

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Though they might be unassuming structures, most water tanks hold a lot of history along with the liquid of life. For something that most people take for granted, water towers serve many purposes. They store water for potable use and fire protection and also host vital communication antennas radio, television, and 911 emergency dispatch. Water towers can be billboards – advertising a city, a school, or business – or navigational beacons for pilots. Drive through any small town or city in the United States and it's a good bet that the tallest structure is the water tower.

Water storage dates back at least a few thousand years. Ancient Rome had a sophisticated system of aqueducts and canals to transport water. Early American water systems helped prevent the spread of disease and fire – much like water systems continue to do so in modern times. Having access to clean water means people can wash themselves and their clothes more frequently. This helps prevent the spread of disease, whether it's cholera or COVID-19.

Early settlements in the United States often were established near springs, rivers, lakes, or other water resources. Early settlements did not have the infrastructure necessary to store large quantities of water or to carry it from longer distances. Farming was the occupation for most early Americans. Farmers relied on precipitation and what water could be found from nearby sources to grow their crops.

During the Second Industrial Revolution – which roughly spanned the last three decades of the 19th Century and the first decade of the 20th Century – many people moved from farming communities to cities. Immigrants seeking employment and a better life also flocked to the cities. Urbanization caused the population to swell from 38.6 million in 1870 to 100.5 million by 1915, according to the U.S. Census. As the number of people rose, so did the water demand.

Water was needed for potable, fire protection, and process purposes. As water demands increased, so did the urgency to store and reliably transport it from a water source directly into homes and businesses. Water storage towers and tanks were designed and built to provide these functions.

Chicago and New York are dotted with some of the oldest water tanks still in use. Wooden tanks for fire protection are perched atop many high-rise buildings in the two cities. Though their numbers are dwindling, these iconic structures are very much a part of New York's and Chicago's skylines.

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After WWI, arc welding was introduced and had all but replaced the riveting process by WWII. Welding sped up the construction process considerably and allowed for more innovation when it came to shapes. Earlier elevated water towers were mostly standpipes or a variation of the “Tin Man” shape, so nicknamed because it resembles “The Wizard of Oz” character.

By the latter half of the 20th Century, enough technological advancements in welding had been made to spur the development of whimsically designed storage tanks. It’s hard to miss these roadside attractions shaped like a giant catsup bottle, Swedish coffee pots, a Dixie cup, or a giant peach.

Ubiquitous as water towers are across the United States, it should come as no surprise that many are deemed historical and as worthy of preservation as notable homes and buildings. The National Register of Historic Places includes buildings, sites, structures, districts, and objects. Dozens of water towers appear on the list – with most states choosing to seek historical status for some of their oldest water towers.

One hundred and twenty years after it was constructed in 1897, the Dothan Dixie Standpipe was added to the National Register of Historic Places. Even more amazing, the 150,000-gallon standpipe is still operational.

During the Great Depression, the newly formed Public Works Administration greenlit the construction of many elevated water tanks. The steel tanks were

often built-in areas with no water facilities before the construction of the tower. Instead, the areas relied on springs, wells, or even rainwater collection. That was the case for the Cotter Water Tower in Cotter, Arkansas.

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STORAGE TANKS – A SLICE OF AMERICANA

The Highland Water Tower in Saint Paul, Minnesota, was designed by Clarence W. Wiginton, the country's first African-American municipal architect. Built in 1928, the tower can hold 200,000 gallons of water.

Alcatraz Island has a rich history and not simply because it's home to the Alcatraz Federal Penitentiary that housed some of America's most notorious criminals. Before its transformation into a tourist attraction, Native Americans occupied the island to protest federal policies related to American Indians. The Native Americans cited the Sioux Treaty of 1868, which stated all abandoned federal lands return to the Native people who once occupied said lands. During the occupation, protestors painted the island's water tower to say, "Peace and Freedom. Welcome. Home of the Free Indian." The steel tower and the words painted on them remain on the island, a history marker more than 50 years after the occupation.

Water tanks can sometimes become such a part of the community that people will take measures to preserve the structures, regardless of whether they are deemed historical. Travelers who find themselves in Freeport, Minnesota, are welcomed by a bright, friendly smile on one of their water towers. It is difficult to forget the giant smiley face on the riveted tank. When people heard that the century-old tank needed a paint job last year, money poured in. Out-of-town passersby contributed a sizeable portion of the donations, according to an SC Times article.

During the pandemic, hometown pride members in Cumming, Iowa, spent eight months sprucing up an old water tower, according to the Des



"ALCATRAZ ISLAND HAS A RICH HISTORY AND NOT SIMPLY BECAUSE IT'S HOME TO THE ALCATRAZ FEDERAL PENITENTIARY THAT HOUSED SOME OF AMERICA'S MOST NOTORIOUS CRIMINALS."

Moines Register. Even though the water tower no longer held water and hadn't been painted in more than 50 years, the townspeople saw the value in transforming the tower with a mural depicting the city's history.

Water towers are a piece of Americana with an enduring legacy.

Next time you're on a long trip, it's a good bet that the way you'll know the name of a town is by glancing at the nearest water tower. Much like the friendly face found in Freeport, water towers have a way of reminding us of where we are and welcoming us to our next destination. 📍



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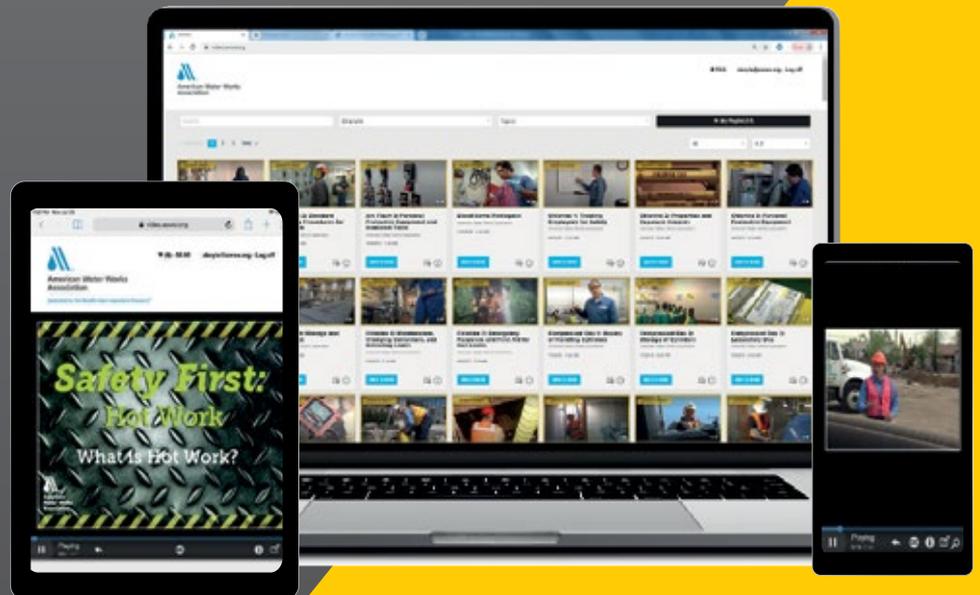
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Let's Talk About

CONFINED SPACES

By Darrel West, Gwinnett County Department of Water Resources,
darrel.west@gwinnettcountry.com

When those of us who have been in the water and wastewater industry hear the words 'confined space,' we typically start thinking about our sewer systems, lift stations, or some less-than-ideally designed underground tank. Perhaps you have had the opportunity to be in a confined space, such as a sewer manhole, and thought to yourself, "**Wow, this sure is a**

confining space I am in" and you would be correct. Personally, when I hear the words 'confined space,' I tend to think about areas that are dark, dingy, smelly, and have more than just a few cockroaches (even the occasional albino ones) living in there – all of whom are more than willing to run up your pant leg. Yes, tanks, pits, vaults, and manholes are all examples of confined spaces, but what makes them a confined space?

CONFINED SPACES

Any way we slice it, confined spaces are not exactly set up for hosting the annual family picnic, but so what? “So the occasional roach runs up my pantleg and I get a little dirty – what’s the big deal?” Good question and glad you asked it. It’s simple – confined spaces have and unfortunately will, in all likelihood, continue to take the lives of either unsuspecting or recalcitrant entrants, period. To further compound the issue, in situations involving a fatality, there is mounting evidence that multiple fatalities are the norm.

“If you have to work in and around an area that has the potential to take your life or the life of a co-worker, it makes sense to do a bit of a deep dive into understanding what to be on the lookout for, what the problems could be, and more so, how to either avoid or remove those associated challenges.”

If you have to work in and around an area that has the potential to take your life or the life of a co-worker, it makes sense to do a bit of a deep dive into understanding what to be on the lookout for, what the problems could be, and more so, how to either avoid or remove those associated challenges. I could tell you about any number of confined space fatality stories the search engine of your choice will spring to life on your computer screen as a shock and awe tactic, but rather have decided to honor those individuals by using this platform to educate, encourage, and inspire.

Let’s Start From the Beginning

The Merriam-Webster dictionary does not define a confined space. That’s right, you will not find the definition of a confined space in the dictionary. If we want to find the definition of a confined space we are going to have to peek into the Occupational Safety and Health Administration’s 29CFR 1910.146 or 1926.1203, otherwise known as the confined space standards for general industry and the construction industry respectively. For the duration of this article, we will be referring to Federal OSHA’s general standard for confined space entry.

The Occupational Safety and Health Administration (OSHA) defines a confined space as any area that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work

AND

- Has limited or restricted means for entry or exit

AND

- Is not designed for continuous employee occupancy

Hopefully, you noticed that the word **AND** was both capitalized and in bold between each of the confined space criteria. The “ands” are very important. If an area exhibits only one or two of the key characteristics, then it cannot be

a **confined space** – a confined space has all three characteristics.

Let’s break each of those criteria down a little for clarity’s sake.

Is large enough and so configured that an employee can bodily enter and perform assigned work. This one is straightforward and does not typically require much explanation.

Has limited or restricted means for entry or exit. This is how you get into and out of a space. If you get into the space via a ladder, manway, or mechanical hoist then the space has limited means for entry and exit. Essentially if there are any physical barriers that impede self-rescue (such as the absence of a standard industrial door or stairs), it likely represents a limited entry or exit situation.

Is not designed for continuous employee occupancy. Was the space built with people in mind? Typically, we are looking for lighting and ventilation. If the space has lighting and forced air ventilation, then it probably is designed for continuous employee occupancy. Other clues to indicate if the area was designed with people in mind include having a physical barrier such as pipes or walls and the area has adequate working space such that an employee can place feet on a floor without having to stand on pipes, pumps, equipment, etc.

Let me see if I can translate from “OSHA-ese” into a couple of real-world examples. Take for example a 10-foot-deep vault with metal rungs built into the concrete. Ask the three questions above to decide whether or not the area in question is a confined space. If you ask yourself the all-important three questions, your answer should be this vault is:

- big enough for you to get into and work
- is limit entry and exit (ladder)
- not designed for employee occupancy (no lighting and ventilation)

Therefore, it is a confined space.

On the flip side, my office is not a confined space.

Sure, it is large enough and so bodily configured to enter (barely, but it is) so it meets the first definition of a confined space; however, my office does not have limited entry or exit (it has a standard industrial door) and it is designed for continuous employee occupancy (it has lighting and ventilation). My office only has only one of the three necessary characteristics – it is not, and by definition, cannot be a confined space.

Jumping to Permit-Required Confined Space

So, now that we are clear about what a confined space is, what is all this talk about danger and taking of lives? Another good question, glad you asked that one as well. Oftentimes, those same confined spaces have an associated hazard or multiple associated hazards simply because of the purpose of the space. A confined space with a hazard becomes what is commonly referred to as a “Permit-Required Confined Space.”

A Permit-Required Confined Space is a confined space with one or more of the following hazards:

CONFINED SPACES

- Contains or *has the potential* to contain a hazardous atmosphere; **OR**
- Contains a material that has the potential for engulfing an entrant; **OR**
- Has an internal configuration that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; **OR**
- Contains any other recognized serious safety and health hazards.

Hopefully, you noticed that the word **OR** was both capitalized and in bold between each of the hazards.

When a confined space contains one of the four hazards categories, it is a Permit-Required Confined Space.

Let's break each of these hazard criteria down for the sake of clarity.

Contains or has the potential to contain a hazardous atmosphere. The air you are breathing right now is about 20.9% oxygen, at least I hope it is. 20.9% can be thought of as the baseline when it comes to oxygen – ideally, if we are going to be breathing in a confined space (and breathing is good), we are shooting for that 20.9% oxygen number. While 20.9% is great, there is something called an acceptable range. OSHA defines that range as between 19.5% or as much as 23.5% oxygen. Anything below 19.5% is an oxygen-deficient atmosphere which can lead to asphyxiation. If the atmosphere contains greater than 23.5% oxygen, the atmosphere is now oxygen-enriched which can create a flammable or explosive atmosphere. From there contaminants vary, however in the wastewater industry the most common contaminants of concern include carbon monoxide, hydrogen sulfide, and explosive gases such as methane.

Let's start with carbon monoxide. Carbon monoxide is a colorless, odorless, tasteless gas. OSHA's 29 CFR 1910.1000 table Z-1 lists the permissible exposure limit as 50ppm as an eight-hour time weighted average based on a 40-hour work week.

Methane is another colorless, odorless, tasteless gas. Methane also represents an explosion hazard. There are of course other flammable gases, vapors, and mists but in the wastewater industry, methane is common. Explosive gases, vapors, and mists should not exceed 10% of their lower flammable limit (LFL).

The final and very common gas in the water/wastewater utility industry is hydrogen sulfide. Hydrogen sulfide has a telltale rotten egg smell which can quickly overwhelm a sense of smell rendering a person with olfactory fatigue and the inability to detect the compound. The ability to detect returns in the vast majority after removal from the area. OSHA's 29 CFR 1910.1000 table Z-3 lists the acceptable ceiling concentration for hydrogen sulfide at 20ppm.

While these are the most common gases analyzed in the water and wastewater industry, chlorine gas, as well as ozone, are other common gases which deserve mentioning and if appropriate, monitoring.

Contains a material that has the potential for engulfing an entrant. Materials that have the potential for engulfing an entrant include both liquids or flowable solids, such as lime or carbon. Oftentimes the removal of such material may be necessary for safe entry.

Has an internal configuration that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section. Occasionally confined spaces have sloped floors with small openings at the bottom. Examples include hoppers or silos. Should an employee slip and fall in such a location they could become lodged in that small opening and suffocate.

Contains any other recognized serious safety and health hazards. Many confined spaces have other serious safety and health hazards such as a fall potential, moving mechanical parts, or electricity.

As the name implies, a permit is necessary for entry into a permit-required confined space. As a little side note, the definition of entry into a permit-required confined space is considered to have occurred when any part of an entrant's

“**The final and very common gas in the water/wastewater utility industry is hydrogen sulfide. Hydrogen sulfide has a telltale rotten egg smell which can quickly overwhelm a sense of smell rendering a person with olfactory fatigue and the inability to detect the compound. The ability to detect returns in the vast majority after removal from the area. OSHA's 29 CFR 1910.1000 table Z-3 lists the acceptable ceiling concentration for hydrogen sulfide at 20ppm.**”

CONFINED SPACES

body breaks the plane of the opening. The entry permit is a location-specific document which is part of an overall program for controlling and protecting employees entering into permit spaces. The permit itself is used to document conditions prior to, during, and after entry.

Once an area has been identified as a permit-required confined space and the determination is made that a person or persons must enter this area, what steps are necessary? The answer is basic: "take action to eliminate or control the hazard." Unfortunately, it is easier said than done

“**Confined spaces can be very dangerous areas; however, with the proper training, equipment, and planning, confined space entries can be safe, effective, and successful operations.**”

Eliminating and Controlling Hazards

Let's talk a little about the procedure of eliminating or controlling the hazards, starting with atmospheric hazards.

Atmospheric hazards. Whether we are talking about too much or too little oxygen, carbon monoxide, hydrogen sulfide, or explosive gases, the only way to truly know an atmosphere's components and concentration is by testing with a properly calibrated gas detector (multi or otherwise). There are multiple brands, styles, and price points associated with atmospheric testing equipment to satisfy even the most discriminating buyer. Once the atmosphere has been evaluated, decide whether or not ventilation equipment is necessary. There are several manufacturers of ventilation equipment, but whichever brand and style you choose, make sure it will supply a sufficient quantity for a minimum of 20 air exchanges per hour. Remember, your blower loses a significant amount of ventilation capability with every 90-degree bend; ensure the blower is of sufficient capacity to accommodate. Again, the combination of ventilating a confined space and atmospheric testing is simply to ensure the permit-required confined space you are about to enter has a safe breathing atmosphere and that the atmosphere stays safe. Atmospheric controls may involve the use of filtering respirators or SCBA's (self-contained breathing apparatus). While we are not going to jump into respiratory protection, take note of two things: remember that a filtering mask will do nothing for an oxygen-deficient atmosphere and a respirator cartridge is only good for its intended use. Choose wisely.

Engulfment hazard. Engulfment hazards can be both simple and difficult to control. If a tank, such as a clarifier, can be isolated, the engulfment can easily be drained or pumped out – hazard controlled. When it comes to lift stations, this may become a little more difficult and require line plugging, upstream feeder lift station control, etc.

Regardless of the space, this hazard must be controlled and oftentimes requires a significant amount of planning and team coordination.

Entrapment hazard. Entrapment hazards or internal configuration challenges may require the installation of a temporary floor of sufficient strength to keep workers safe. Every location is different and as such, the safety precautions necessary are not universal and, similar to engulfment hazards, entrapment hazards require a significant amount of planning and team coordination.

Other hazards. Many confined spaces have other serious safety and health hazards, such as a fall potential, moving mechanical parts, or electricity. Control of these hazards will involve the application of locks & tags, tripods/winchers/full body harnesses, line blocking, or the release of stored energy sources. Again, this will likely require a significant amount of planning and team coordination.

Roles and Responsibilities

There are four key roles when it comes to entering a permit space: entrant, attendant, supervisor, and rescue.

Entrant. The entrant is the individual or individuals who are actually entering the space to perform the work. It is imperative this person is trained to not only conduct the work but understand the hazards associated with the work, adequately communicate, and follow instructions if directed to evacuate.

Attendant. The attendant is the individual or individuals stationed outside of the space monitoring the authorized entrants in the space. Their duties are outlined in your site-specific program and often include periodic documentation of atmospheric conditions, monitoring confined space ventilation equipment, gas detection equipment, recognizing prohibited conditions, and taking appropriate action including summoning the rescue service.

Entry Supervisor. The supervisor plays a very important role in the permit program. The supervisor has overall accountability for the entry, including terminating entry.

Rescue. When it comes to rescue, there are a couple of options – self-rescue or a rescue service. For my money, self-rescue is going to be the quickest and most efficient way to safety. For instance, if the confined space gas meter starts alarming, leave the space immediately. Perhaps the entrant has sprained their knee and is no longer able to climb a ladder. In that case, a retrieval device such as a tripod and winch combo and full-body harness allow the attendant to safely winch an entrant to safety. Under no circumstance should an attendant enter into a permit space for rescue purposes.

There is also a rescue service. Rescue services can be internal or external. An internal rescue service is an in-house team of trained and equipped individuals whereas an external rescue service could be your local fire department provided they are trained, equipped, and are willing and able to respond in a timely fashion to an emergency.

CONFINED SPACES

Summary

Let wrap this up with a quick summary of what we covered.

A confined space is any area that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work, **AND**
- Has limited or restricted means for entry or exit, **AND**
- Is not designed for continuous employee occupancy.

A permit-required confined space is first and foremost a confined space but now with at hazard. Hazards categories include:

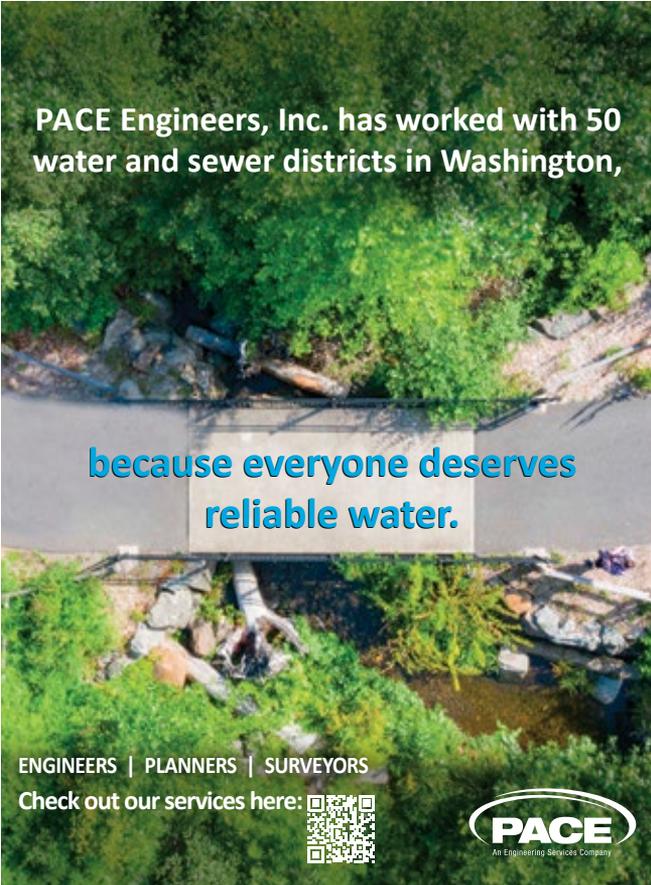
- Contains or **has the potential** to contain a hazardous atmosphere; **OR**
- Contains a material that has the potential for engulfing an entrant; **OR**
- Has an internal configuration that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section; **OR**
- Contains any other recognized serious safety and health hazards.

Once the determination has been made to enter a permit-required confined space (any part of your body breaking the plane of a space), all hazards must be understood,

controlled, and made safe. These safety measures include atmospheric testing, ventilation, removal and/or control of engulfment hazards, and of course should something go wrong, a procedure for extricating an individual such as a tripod, winch, and full-body harness. All of these safety and control measures should be recorded on your location's permit-required confined space entry permit.

Understand this article is designed to simply give a basic overview of the hazards associated with permit-required confined space entries as well as a few examples of safety precautions and equipment necessary to keep employees healthy and safe. If employees are planning on entering into confined spaces and have not yet participated in detailed confined space entry training, you are encouraged to reach out to the many providers of quality confined space entry training, including your insurance provider, risk management department, safety or training departments, private training firms, etc.

Confined spaces can be very dangerous areas; however, with the proper training, equipment, and planning, confined space entries can be safe, effective, and successful operations. 

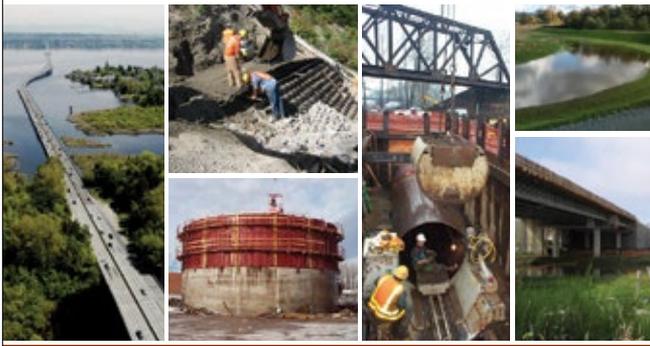


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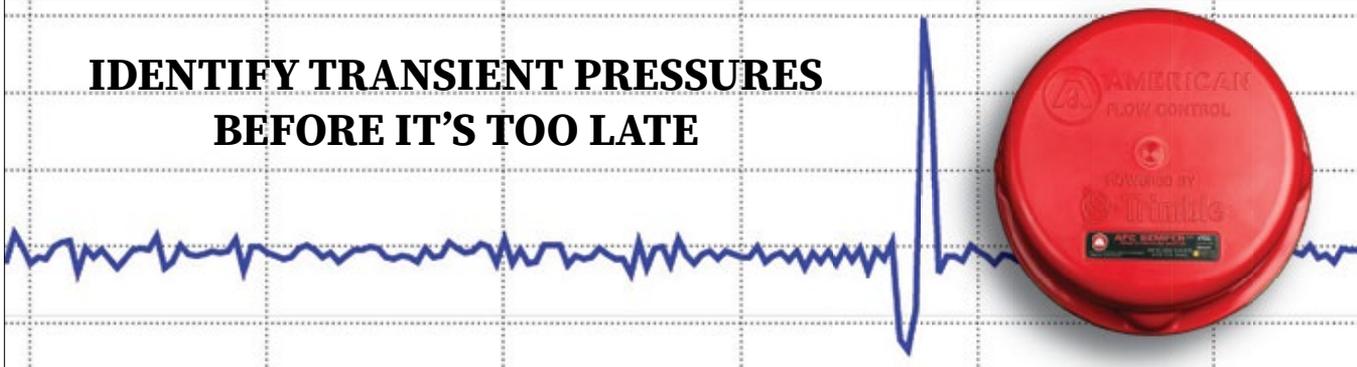


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King County Subsection

As we enter the summer season, we're looking forward to connecting through virtual trainings and planning for our first in-person event since the shutdown – starting with the Annual Golf Tournament. It's been a long year but we're looking forward to summer.

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. Connect with our Board Membership Committee liaison Joanie Stultz, jstultz@brwncauld.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. Planning is already underway for a program of more virtual classes in the fall 2021. 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.

Events

Virtual Paint Night a Success

The King County Subsection hosted a Virtual Paint night on March 26 – our first virtual social event to connect and support Water For People. We partnered with Uncorked Canvas, a local paint shop that shipped out the paint kits, ahead of the event, and provided an instructional video to help participants follow along.

Thanks to our participants for a fun night and their generosity in raising funds for Water For People!

Transitions and Recruitment

There have been some transitions to the KCSS leadership. Thank you to those whose efforts brought in participation, value and excitement to the virtual events and classes. We look forward to seeing you at future

IT'S TEE TIME!

The annual Charity Golf Tournament is back and currently planned for Mid-September 2021 (date to be confirmed). This will be KCSS's first in-person event, following the shutdown last March. We will be following all local and CDC guidelines for gatherings.

Look out for the save the date and registration information. To our past and new sponsors, **we need you!** Please consider sponsoring the Golf Tournament. Specific details on sponsor levels will be sent out in the coming weeks.

Join us this year for a fun-filled event that will raise funds for great causes!

If you are interested in playing in and/or sponsoring the Charity Golf Tournament, please contact Bill Reynolds at 425-827-2014 or billr@paceengrs.com.



King County PNWS-AWWA events! Please welcome our new volunteers/slate of officers!

- **President** – Joanie Stultz, Brown and Caldwell
- **Vice President** – Caren Gallion, Covington Water District
- **Treasurer** – TBD
- **Secretary** – Jon Miner, Murraysmith
- **Program Director** – Jim Konigsfeld, Sammamish Plateau Water
- **Program Director 1** – Tammy Whipple, Sammamish Plateau Water
- **Program Director 2** – Frank Spevak, Rosemount Analytical & Detection
- **Young Professionals and Student Liaison** – Steven Neubauer, Northeast Sammamish Sewer and Water District

- **One-Year Director (Water for People)** – Beth Mende, HDR
- **Two-Year Director (Competitions)** – Ted Stonebridge, City of North Bend
- **Three-Year Director (Golf Chair)** – Bill Reynolds, PACE Engineers, Inc.
- **Webmaster** – TBD
- **Past-President** – Charlie Sovacool, Consolidated Supply Co.

The Subsection is looking to fill the following roles for 2021:

- **Treasurer:** The Treasurer is the Subsection's fiscal agent, in charge of managing the Board financials. Tasks include depositing funds, tracking the accounts, and preparing monthly and annual financial statements for

Subsection Updates

Board approval. The role is a one-year minimum term, with two-year suggested term. This role is critical to the Board's operations and will be well supported by the current Board members and outgoing Treasurer, as well as the AWWA Board. We are looking for someone who has a passion for AWWA, and an interest in learning the ins and outs of the Board's financials.

- **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.

If you are interested in either role, please contact Subsection President Charlie Sovacool at charlie.sovacool@consolidatedsupply.com.



Membership Kudos

Thank you Charlie, for your service as the Board President and extending your service to support us during the COVID-19 pandemic. We are grateful for your leadership and contributions to the KCSS!

Get involved with 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, please contact Subsection Secretary Jon Miner at jon.miner@murraysmith.us.

South Sound Subsection

Update

This past year, the South Sound Subsection has continued to meet monthly – and although virtually, it has been a great way to stay connected. We have been hard at work, continuing to provide trainings and exploring new options for events, and look forward to connecting with you virtually and (hopefully) in-person again soon.

We welcomed Michelle Poquette from Tacoma Water as our incoming Treasurer (thank you Tim Wells for all your efforts). She is serving her second term on the current Board.

- **President** – Jolene Gibson (Tacoma Water)
- **Vice President** – Shantel Shepard (Tacoma Water)
- **Secretary** – Jeremy Djajadi (Sybis LLC)
- **Board Member** – Michael Lubovich (Kennedy Jenks)
- **Board Member** – Will Smythe (Parametrix)
- **Past President** – Kali Kocdemir (Nicor, Inc.)

Trainings

The South Sound is planning on three, possibly four virtual trainings for 2021.

In March, we successfully held our popular Waterworks 101 class. We had great attendance and engagement for our two half-day sessions. Watch our website for upcoming training announcements and save the dates for June and October/November: topics we are looking at are Water Quality, Asset Management, and Construction Inspection.

Upcoming Events

We hope to host an in-person event this year, but we're not sure how that will look yet. We are currently exploring options – maybe a golf tournament later this summer, or a social later this fall – and looking forward to connecting with you all again soon.

Congratulations

A shout out to our recent award recipients! **Jeremy Djajadi** from Sybis LLC was the Subsection Advisory Council awardee. Jeremy has been instrumental as the South Sound Subsection Secretary and Chair for the Water Information Technology Committee.

In June, **Shantel Shepard** from Tacoma Water will be awarded the *Kenneth J. Miller Award*.

Thank you both so much for everything you do, you inspire us all!

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Membership Engagement and Development Committee (MEDC) and 2020 Vision Subcommittee

In normal years, we would have returned from our Section Conference in early May with new connections and excitement. Instead, we had to find new ways to connect virtually through our quarterly trainings and events, which have allowed us to connect more regularly across the Section. **So, even though we did not have an in-person Conference in 2021, there are still many ways to get the most out of your membership!**

Engage New Members

At the MEDC, we're tasked with the following:

- Connect new members with resources,
- Provide membership lists to Subsection leaders,
- Run the PNWS Mentorship Program and pair mentors and protege on an annual basis, and
- Support student involvement in partnership with the YP Committee.

Whether you're a new member looking to get connected or a Subsection leader needing help with tracking your membership lists, we're here for you. Connect with MEDC Chair Chris Young at chris.young@murraysmith.us if you need support, or visit our website, www.pnws-awwa.org/get-involved/awwa-membership, and apply to become a member.

We Need You - Join MEDC

The MEDC and 2020 Vision Subcommittee are actively recruiting

ASIAN-AMERICAN AND PACIFIC ISLANDER HERITAGE MONTH

Through the Month of May, the PNWS and AWWA joined to celebrate Asian-American Pacific Islander Heritage Month (AAPIHM).

In 1992, AAPIHM was officially designated and selected the month of May to commemorate key moments in history: in 1843, when the first Japanese immigrants arrived in the U.S., and 1869, when the Transcontinental railroad – built primarily by Chinese immigrants, who received little recognition for their contribution and sacrifice – was completed.

THE CONTRIBUTIONS OF ASIAN-AMERICANS AND PACIFIC ISLANDERS (AAPI) EXTEND TO THE PUBLIC HEALTH OF ALL AMERICANS

To learn more about the history of AAPI and ways to participate in the Heritage Month, visit www.asianpacificheritage.gov.

for member volunteers. If you'd like to join a meeting and learn more, please contact Chris Young at chris.young@murraysmith.us.

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 us, please contact D&I Chair Esther Chang at esther.chang@jacobs.com.

"Being Your Authentic Self" Event a Success

On March 25, 2021, we held a Virtual Panel Discussion and Social on *Being Your Authentic Self* via Zoom. Thank you to our event facilitators

Courtney Thomas and Joanie Stultz; and our panelists Ari Copeland, Erika Schuyler, Marika Thomas and Ann Hajnosz for sharing your experiences to our small breakout group moderators – Kim Reid, Randy Black, Deanna Martin, Jay Macpherson, Chris Young and Crystal Jensen – and attendees. We look forward to connecting with you at future D&I Committee events in the future.

Membership Survey

To better understand our current membership as well as how to attract and retain new members, we created an anonymous and voluntary survey to collect baseline data, such as demographics and feedback, to better serve our Section. The survey takes just five minutes to complete and will help us identify areas of improvement to promote an inclusive environment, where all members feel welcome. 



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