



NHWWA
NH WATER WORKS ASSOCIATION

Journal

Volume 1, Spring 2023



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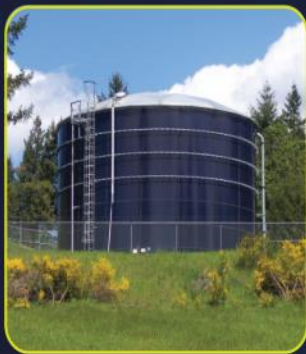
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JOURNAL

Volume 1, Spring 2023

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SAVE THE DATES

Construction Day—August 2, 2023

NH Drinking Water Expo & Trade Show—October 19, 2023

For a complete list of our events please visit our website at nhwwa.org.

**Go to [NHWWA.org/About Us](https://nhwwa.org/About Us) for the electronic
version of the Journal with active links.**

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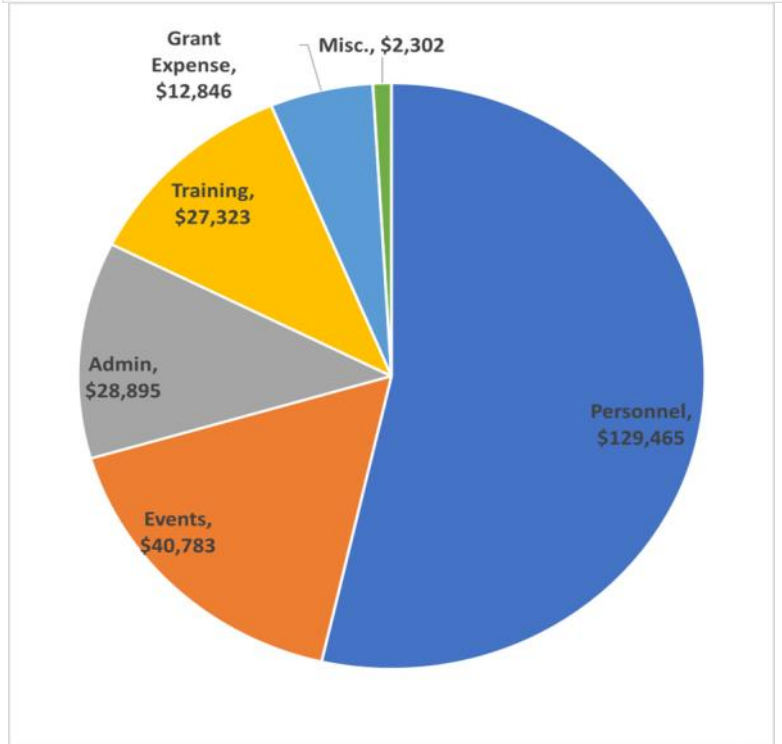
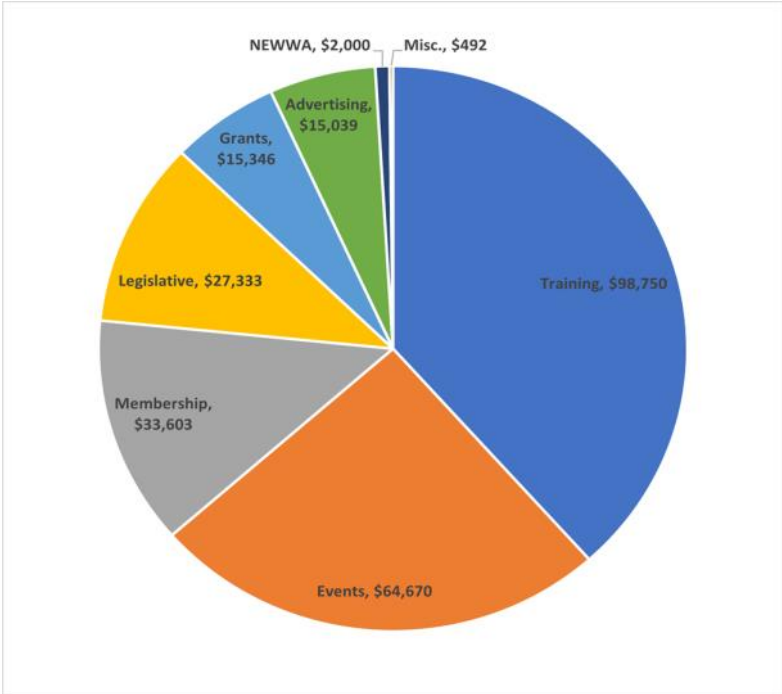


NHWWA 2022 Annual Report

2022 was a strong year for your Association, as we continue to grow and evolve to better meet the needs of our supporters in the public drinking water sector. We first summarized the year at our on-line March 9, 2023 Annual Meeting, with roughly 20 minutes of presentations to a core group of water professionals. Watch the recording at [Annual Meeting Recording](#), passcode: ECHv+s1N. Highlights of the year, with priorities for 2023, are outlined below.

Major Accomplishments. The Association provides the majority of our sector support through continuing education and professional certification training programs. Creating Grade-appropriate and relevant curricula presented by experienced colleagues and peers, delivered in both live and live-remote formats, is central to meeting your needs. Some specific accomplishments include:

- ◆ Redesigned Grade C1A / 1 Training and met our 50 student/year capacity goal.
- ◆ Created Grade 2 treatment exam prep class.
- ◆ Introduced Leadership Roundtables to build “soft” management skills and peer networks.
- ◆ Redesigned and improved our annual Exposition and Trade Show.
- ◆ Launched our first Diversity in Water Technical Symposium to highlight roles of women in the water workforce.
- ◆ Aligned our Strategic Plan, Board governance, annual budget, and leadership team.
- ◆ Supported the new, highly competent, and energetic NHWWA Young Professionals team.



We continue to work closely with our partners at NHDES to share and integrate operational, financial and regulatory topics that keep our sector at the front of a national performance curve.

FINANCIAL CONDITION

With your partnership, our NHDES education and training contract, and strong attendance at our classes and events, we built on a solid foundation to make 2022 a financial success. As a fee-based nonprofit organization, our goal is to meet your training, advertising, recognition, and engagement needs in a value-added way that makes it easy for you to continue your financial support. As a result of collaboration and partnerships:

- ◆ The Association is on solid financial footing.
- ◆ Our FY2022 Net Income was roughly \$19,000 over FY2022 Budget.
- ◆ Our FY2022 Net Income was about \$35,000 over FY2021.

The pie charts on page 8 show our general revenue and expense items and amounts for 2022.

2023 PRIORITY GOALS

2023 is expected to be another year of growth and positive change, as we continue the trends started in 2022, building on success through mission-focused, results-driven decision making. The following areas touch on key focus areas:

Training

- ◆ We launched a Grade D2 Exam Prep class in March, with 25 students attending at Manchester Water Works' new training facility. Taught by teams of NH water professionals, we will continually improve our T2 and D2 curricula based on experience and student feedback. Moving forward, we plan to offer the T2 training each Fall and the D2 training in the Spring.
- ◆ With NHDES financial support, we will purchase hardware that allows improved live, in-person / remote hybrid

instruction, reducing the barrier of travel to connect with and learn from peers from across the state.

Communications

- ◆ Provide tools to operators and owners to better connect, inform, and engage with customers. Our goal is to build informed local support for public water that translates into awareness of careers in water, better understanding of individual and town roles in sustaining our drinking water systems, and improving public water policy decision-making processes.

Workforce Development

- ◆ Create career paths that provide entry points from a variety of potential employees (high schools and community colleges, mid-career changes, military veterans).
- ◆ Communicate opportunities to potential workers to increase the number of applicants to the water profession.
- ◆ Continue to represent NH with the NEWWA-led regional “Work for Water!” initiative.

Association Growth

- ◆ Increase revenues through existing and new initiatives, to have the capacity to meet the growing needs of the public water sector.
- ◆ Continue strategic, governance and leadership alignment to enhance our ability to meet current and future needs.
- ◆ Successfully engage with our next President and CEO, to continue building on the growth and success of the past few years.

The Board and Staff of NHWWA want to thank YOU for your service to public health and the environment, delivered 24-7 / 365 through often challenging conditions, with integrity, commitment and professionalism. Please let us know your ideas and needs so we can work together to meet them in 2023 and beyond.



Opening for the Best Job in New Hampshire's Drinking Water Sector!

The NH Water Works Association is embarking on an important transition as we search for our next **President and CEO**. We are looking for a well-rounded, well-connected, experienced, innovative and enthusiastic leader to build on our recent successes and carry the Association forward. With substantial initiatives in funding, workforce, communications, and organizational growth well underway; a high level of credibility and respect; and a solid financial foundation, this is a premier opportunity for the right person to find professional and personal fulfillment. [Click here](#) or visit nhwwa.org to see the position description. Please submit your letter of interest and resume as PDF files via email to Info@NHWWA.org, with "PCEO Application" in the subject line. Applications will be accepted until the position is filled, with a targeted and flexible start date of July 2023.



Gathering of New England Regional Association Directors before April 2023 NEWWA Spring Conference in Worcester, MA. It is an honor to be part of such an influential, effective, and energetic leadership team!

Water Works Operator Certifications in 2022

The following water operators were newly certified in New Hampshire in 2022. CONGRATULATIONS OPERATORS!

LICENSED OPERATOR		TREATMENT GRADE	DISTRIBUTION GRADE
NICHOLAS	BENNION	I	I
VINCENT	BOUCHER III		I
RUSSELL	BROWN	CIA	CIA
JOSE CARLOS	BUNAG	CIA	CIA
KARL	CHANDLER	CIA	CIA
SPENCER	CUSSON	I	I
JUSTIN	DEMINGWAY	I	I
SARAH	DRAPER	CIA	CIA
THERESA	EICHHORN	CIA	CIA
JASON	FEE	CIA	CIA
LANCE	GAUTHIER	I	I
CASEY	HARDING	II	
KEVIN	HARROLD		I
MICHAEL	HAUPTLY-PIERCE	CIA	CIA
JOSEPH	HESS	III	II
KYLE	HOUGHTON	CIA	CIA
JULIANNA	HROMIS	I	I
BRIAN	JACKES	I	I
MATTHEW	JAMES	I	I
NEMANJA	JANKOVIC	I	II
DAVID	KELLY	CIA	CIA
STEVEN	KNIGHT	I	I
AARON	LABONVILLE	I	I
KENNETH	LABRANEY	I	I
ETHAN	LAVOIE		I
ERIK	LYNCH	I	I
ROBERT	LYONS	I	II
IGOR	MACHADO NUNES	CIA	CIA
IAN	MACLACHLAN	I	
JOSHUA	MAGUIRE	I	II
GEORGE	MALONEY		I

LICENSED OPERATOR		TREATMENT GRADE	DISTRIBUTION GRADE
LEWIS	MARSH	I	I
NATHANIEL	MARTIN	CIA	CIA
SETH	MARTIN	CIA	CIA
RYAN	MASON		I
VINCENT	MASTROIANNI	CIA	CIA
MICHAEL	MILLER JR		I
JOHN	MITCHELL	CIA	CIA
CURTIS	MORROW		I
TRAVIS	NICHOLS		I
CHRISTOPHER	PELLETIER	III	III
ASHLEY	PIPER	II	
CANNON	POLAND	I	I
RYAN	RILEY	I	I
CHRIS	ROBILLARD		I
MICHAEL	ROBINETTE	CIA	CIA
MURIEL	ROBINETTE	CIA	CIA
JUSTIN	RUSKOWSKI	I	I
JOSH	STEFANILO		I
MICHAEL	STICKNEY		I
BRADLEY	TALLEN	I	I
BENJAMIN	TOOMEY	CIA	CIA
GEOFFREY	TYSON	CIA	CIA
KENNETH	VANDENBURGH	I	I
BRIAN	VOSE	I	I
KYLE	WILLIAMS	I	I
MICHAEL	WORTERS	I	I
JEFFREY	WRIGHT		III



Why Inspect and Clean Your Water Storage Tank and What You Might Find When You Do

by David Cornish, President
Underwater Solutions, Inc.

Water tank inspections can sometimes be viewed as a check in the box to satisfy Federal, State and Local regulatory standards, but there's more to it than that. Why is that? Well, many of those answers can be found below from our experience over decades in the industry.

The task is grueling for the company performing the work, traveling the country, climbing tanks- sometimes upwards of 200 feet, hoisting equipment and tools, following stringent safety, disinfection and many other guidelines, all while battling the uncertain New England weather. It can be considered an inconvenience to daily operations for the water system, similar to visiting the doctor for a checkup knowing you'll be leaving with a checklist of things you didn't necessarily want to hear. However, this is our water and the infrastructure that provides it, so the stakes are high to maintain it to the highest standard.

Performing routine inspection of tanks, clearwells, filters, intakes and similar structures throughout the water process should be viewed as an ongoing diagnostic to determine exactly how a particular asset's lifespan can be extended for future generations to come, while doing so at the lowest lifecycle cost to taxpayers and their water rates.

Having a proactive approach on our water systems rather than reactive will always prevail, as nothing will always remain in perfect condition when it comes to steel and concrete structures exposed to the elements. I often like to compare this to a vehicle - A depreciating asset that requires routine maintenance such as oil changes, tires, rotors, brake pads, etc. to be driven safely and to extend its life exponentially. The same holds true for our water distribution systems. Performing planned, prioritized routine maintenance spread out over a given period before complete failure happens creates a cost effective and manageable process.

So, let's get into it. Inspections can be complicated, as almost no two tanks are the same. The inspection should cover everything from A-Z, confirming things that are compliant while setting the focus on non-



A diver from Underwater Solutions, Inc. prepares to enter a water tank to conduct an inspection.

compliant or deficient items. A system such as this allows maximized efficiency on what happens on the back end, which is being able to plan and complete the required remedial action for the deficiencies found.

The best way to do this is to inspect by dissecting the structure during the inspection. For example, North, South, East and West Quadrants and then a second layer of Upper, Middle and lower sections. This allows an efficient inspection and testing while ensuring every inch of the structure is covered. If data is gathered correctly, a report can then be populated, and remedial action categorized and then prioritized within those categories. The five categories that we utilize to break this down post- inspection are **Sanitary, Security, Safety, Structure, and Coatings**.

Let's focus primarily on the sanitary end of things for the purposes of this article, as some categories are entire articles themselves such as *Structure* and *Coatings*. However, I will briefly cover portions of *Security* and *Safety*, as security threats can lead to potential for impacted water quality if the structure is not secure. Safety and the

associated tank safety equipment is also vital to successfully performing an inspection as well as post-inspection services on tanks.

SANITARY

The most important step in the inspection process to the tank's sanitary status is identifying ways in which water quality can become adversely affected. The combination of items in which this happens is most commonly through the structure itself, or the tank components.

The leading cause of sanitary deficiencies: Open rooftop penetrations. Things like missing rooftop rigging hole plugs in steel tanks that have a designed use for maintenance but require a plug at all times, unless of course interior work requiring their use is being performed. High winds and harsh winter conditions are most often the culprit for these plugs



Unmaintained or non-compliant Vents, Overflows, Screens, and Hatches become a point of entry for rodents, birds, bats, snakes, worms, bugs, and other organics that can impair water quality and sanitary conditions.

going missing. Unfortunately, the reality is that a few dollar PVC plugs can be the factor behind a bacteria hit or other adverse water quality problems when birds, mice and other critters are looking for a warm place to call home.

Torn or missing vent and overflow screens are the second most common occurrence we find. It's important to ensure that 24-mesh stainless steel screening is securely in place at all times on all components designed with penetrations to prevent this condition. Having both a primary and secondary screen in-place can further protect against intrusion. Upgrading to an AWWA compliant, failsafe, frost proof vacuum palletted rooftop vent should take place to improve airflow and to ventilate the vapor zone of the tank, while also providing a better, more secure screen system.

Rooftop hatches should be hinged with a minimum 2" overlapping cover with a riser on steel tanks and a concrete trunk on concrete tanks. Ensuring this is the case can prevent water runoff into the tank by rain carrying contaminants. Upgrading hatches to meet these requirements can be done at a minimal cost in most cases.

Sediment that has accumulated on the floor of the structure should always be removed during inspection, in my opinion. The reasoning behind that is even a thin layer of sediment can prevent the ability to inspect the floor surfaces, while also reducing the potential for bacteria to develop in that sediment. Depending on the biologics of that sediment, such as Manganese, you can also potentially increase the efficiency of your disinfectants and lessen the dosing significantly. Although the standard on inspection and sediment removal is every 3-5 years, if your tank(s) accumulate significant sediment over a short period of time, best practice would be to consider a more rigorous sediment removal program.

All of the items above should be identified during your inspection and remedial action plan on priority basis, many of which can be rectified on site during the inspection. An experienced inspection company will carry the materials to temporarily or permanently repair these items before departing the tank site such as vent and overflow screens and replacement rigging hole plugs. At a minimum, a temporary repair should be made to prevent contamination while a permanent repair is scoped if it is more technical than what can be accomplished during

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the time allotted for the inspection. Making sure this takes place is crucial, as many water departments and towns do not allow climbing of tanks for water operations staff, and even if they do, these tasks should be performed by a trained professional with the proper certifications to do so.

***Additionally, tank damage, steel fatigue or spalled concrete can also cause open penetrations, while also becoming a structural concern that should immediately be repaired.*

SECURITY

As we all know, water is crucial to our everyday life, and we must protect it at all costs. We can never be certain that there are not people or groups targeting water supplies with intention to cause harm to others. Also, historically, kids love to mess around on water tanks, by way of using their favorite BB gun or unfortunately by climbing them as a dare or for the thrill of it. In addition to beverage cans, trash, sunglasses, and other items, rubber rafts have been found in tanks. It's obvious how a tank could be contaminated in these scenarios.

When we address security during inspections, the most critical problem found is missing or inoperable locks. You can never have enough locks, and they should be replaced fairly often or during each inspection to ensure they are functioning properly. There should also be a fence having a minimum height of 8' plus 12" of barbed wire running the entire perimeter of the tank site, as well as a large enough gate for vehicle access. Barbed wire standoffs are often affected by falling tree limbs, so it's important to stay on top of their repair when they fail. The entry gate should be locked at all times and routinely checked. It also should be posted with "No Trespassing" signs for good measure.

When installing a fence, if you have the room owned by the town/ water system, it's always good to give the area inside the fence more room for routine maintenance. Often times aerial lifts, cranes and other heavy machinery is required for maintenance and they need direct access around the entire structure. Some of this machinery, such as aerial lifts, have safety features built into them that only allow operation at a 10-15 degree grade or less, so maintaining a level tank



Additional security measures include installation of surveillance cameras, motion detectors and alarms in the case unwanted access is attempted.

site without unnecessary obstructions for these services to be performed is important for successful service completion.

A ladder guard with a lock should be properly and securely affixed to the bottom of the tank ladder, and that ladder should begin no less than 12' above the ground to prevent easy, unwanted access. The rooftop hatch should always be locked unless performing routine maintenance. Make sure you require a locked hatch photo of any company performing services as evidence.

SAFETY

Maintenance of tanks should be considered ongoing to best sustain the structure at its lowest lifecycle cost, and when this maintenance is performed, it's crucial that whoever is performing services can operate safely to limit both their liability and the water system's liability. Additionally, working on tanks without safety equipment could slow down the project and ultimately incur additional costs as a result of the lessened efficiency. New England is the birthplace of America and although we are prideful of that, it sometimes reflects in our infrastructure. Some tanks still in use are from the late 1800's! Many of which are extremely solid structurally due to the steel used at

that time as well as protective coating systems evolving and becoming drastically better over the years, but often still lack upgraded safety equipment.

Inspection of safety equipment and the most common non-compliances found are ladders, fall prevention devices, and safety railings. The ladder to the rooftop should be sound and meeting minimum OSHA standards for fixed ladders, having a fall prevention cable securely affixed throughout the length of the ladder to the rooftop. Notched tube versions have gone by the wayside and are no longer considered to be a good standard or practice to have and to use safely. Railings are typically one of the most lacking items found during inspection. The number of tanks throughout the country with little to no railings is quite massive, and without them, there is significant additional measures required to perform services.

Rigging points and a series of OSHA approved rigging ropes must be used to prevent accidental falls. For compliance and avoiding falls, safety hand railings or guard rails should be 42" tall with top and midrails being at least 0.25-inches thick and span the entire circumference of the structure with a toe kick plate securely installed along the bottom. At the very least, railings should extend along the



perimeter of the rooftop access ladder and the adjacent hatch and working area. If railings exist, the welds are examined during inspection to determine their integrity. Although more expensive typically, aluminum, and stainless-steel railings hold up significantly longer with less maintenance required.

WATER QUALITY AND TESTING

As part of your inspection, there should be significant information gathered on conditions that could adversely affect water quality by way of testing performed as well as through visual observation. Using an inspection company whom is experienced in water quality practices is important to properly identify water quality concerns within the tank itself. Obtaining this additional information is key, as it is not necessarily required during a routine compliance inspection relative to the structure but is considered a bonus.

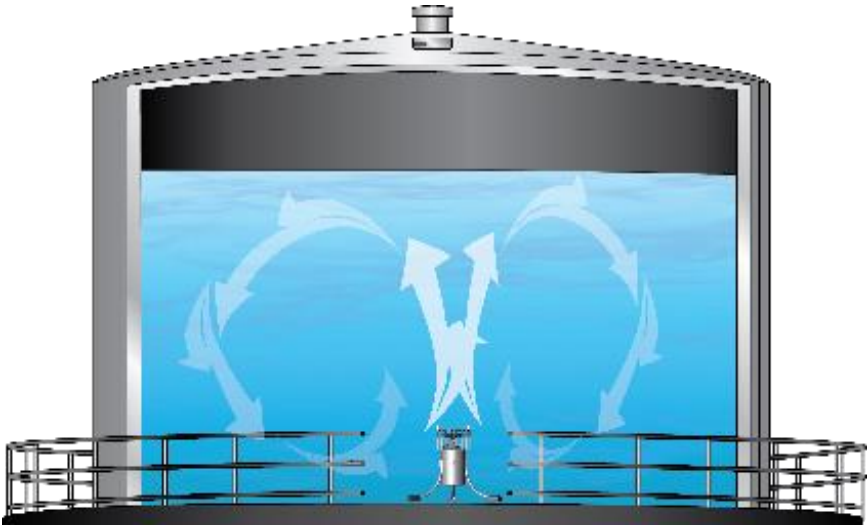
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BEFORE



AFTER





The key to any TTHM reduction is aeration and ventilation!

A few of those additional tests are temperature at both the surface and floor level to determine whether thermal stratification exists, as well as chlorine residual testing at the surface and floor to determine whether chemical stratification exists. Visual observation of biofouling and a gentle wipe of the surface to determine its severity and to be able to differentiate between biofouling and corrosion in steel tanks is key.

Biofouling-This condition will cause a mildew-like buildup on the tank interior, often comprised of both organics and inorganics. If water isn't being transferred in and out regularly through demand at a high enough volume, stagnation of this water can affect the surfaces of the entire interior through biofouling. Of course, there is additional factors such as source water, treatment chemicals and treatment/filtration processes. Determining the existence of biofouling, as well as its severity is important for developing the measures to put in place to remove that biofouling. Find these measures below.

- 1.) Chemical wash** - An in-service inspection is a great way to identify biofouling, its severity and develop a corrective action plan as part of an all-inclusive scope for any other actionable items. In my opinion, utilizing an NSF60 approved chemical wash for an initial removal of this biofouling is the most

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affective, as it is less harsh on the tank than traditional pressure-washing. When cost occurs for this service, the severity of the biofouling determines the amount of product used, so knowing that beforehand is important. Chemical wash completion time varies and is costed based on the size of the structure in addition to severity of biofouling, but most commonly is a 1-2 day process. Once the biofouling is removed, dependent on the type of biologics, there should be an immediate reduction in disinfectants used in the system. Also, if you're a chloramine system, biofouling can be a huge influencer behind nitrification complexities. Removing the biofouling should relieve that a bit in many cases. Once the initial biofilm is removed, during the next inspection, the new data can be cross referenced with the previous report to determine how quickly the biofouling develops to determine the intervals at which chemical wash should be completed. Essentially, inspections and remedial services and products go hand in hand.

- 2.) **Mixing** - Installing an active mixer within the tank to move water at a high rate will avoid stratification, decrease risk of biofouling, as well as many additional benefits such as preventing ice formation and promoting better overall water health. If Total Trihalomethanes (TTHMs), a disinfection byproduct, exist, finding a mixer that has enough thrust to aerate the tank at the surface for off gassing of the volatile compounds is an added benefit, while also decreasing risk of biofouling.

Through all the inspection measures discussed above and the corrective actions that should take place as a result, you can keep your tanks and additional treatment and distribution structures safe, compliant, clean, and sustain them for future generations to come!

David's Bio

David Cornish is the President & CEO of Underwater Solutions Inc. His formal education is in Economics but has spent the last 15 years assisting thousands of public and private water systems comply with EPA, AWWA and local standards through inspection, routine

maintenance and capital improvement to do his part in sustaining integral water infrastructure. Over these 15 years, he has made it his mission to understand the complexities of water and the infrastructure associated with providing clean drinking water to assist municipalities in every aspect of solving those complexities. He is the inventor and patent holder for the USAM technology at Underwater Solutions Inc., a data and AI driven asset management program, the first of its kind. David is second generation owner of Underwater Solutions, Inc.



Underwater Solutions, Inc. (USI) has been in business for over thirty years and is a small, local, family-owned, second-generation business that takes great pride in serving the water industry not only here in New England but throughout the United States. USI specializes in inspections, maintenance, renovations, and asset management of critical water infrastructure to include

water tanks, surface water intake pipes, water and wastewater plants, filters, and clarifiers. USI has inspected and cleaned thousands of water storage tanks, installed hundreds of mixers, and chemically cleaned hundreds of tanks and filters using Pantomite for both private and municipal customers throughout the country. The first in-service inspection by USI was performed in 1990 and the company was incorporated in 1992. The company is now registered in twenty-three (23) states throughout the country, has a corporate office in Mattapoisett, MA and a Service Center in Assonet, MA.

SAVE THE DATE

CONSTRUCTION DAY 2023

WEDNESDAY, AUGUST 2

We'll be visiting sites in Concord, Manchester and Merrimack. Plan to join us on the air-conditioned coach bus, sponsored by Underwood Engineers. Breakfast and lunch provided. Registration details coming soon!



Four Water Associations Meet with Congressman Chris Pappas

On 24 February, the Four Water Associations and senior leaders from NHDES met with Congressman Chris Pappas, US Representative for the 1st NH District and staff member Kari Thurman. The importance of the meeting was underscored by the Congressman's role on the Water Resources and Environment Subcommittee of the US House Transportation and Infrastructure Committee. The meeting was part of legislative outreach by the Four Water Associations (Granite State Rural Water, NH Municipal, NH Water Pollution Control, and NH Water Works Associations) at both the State and federal level.

Key discussion topics included ARPA and Bipartisan Infrastructure Law funding, long term infrastructure challenges, potential impact of earmarks on established programs, the importance of private wells, fluoridation, PFAS and related technical and funding challenges, workforce development, and communications. The Congressman was particularly interested in how loan forgiveness helps Towns and Cities fund key infrastructure investments, how regional approaches enhance public water services, and how cooperating among educators, employers and government can address workforce challenges. He was also interested in how lead service line work, including inventories, is progressing.

Thank you to Manchester Water Works for hosting!



Pictured left to right: Phil Croasdale, Tom O'Donovan, Natch Greyes, Brandon Kern, Rep. Chris Pappas, Heidi Lauricella, Tracy Wood, Boyd Smith, David Miller.

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Proposed Federal PFAS MCLs Raise Concerns

On March 14, 2023, the EPA announced proposed National Primary Drinking Water Regulations for six Per- and Polyfluoroalkyl Substances (PFAS) for Community and Non-Transient Non-Community Public Water Systems. The EPA proposed regulations are draft and are not enforceable until finalized, likely a one- to two-year process.

The draft Maximum Contaminant Levels are:

- PFOA – 4.0 parts per trillion (ppt)
- PFOS – 4.0 ppt



Newly installed PFAS filter at Merrimack Village District water treatment plant, 2020.

For more information on the EPA proposed MCL, see EPA’s Fact Sheet: [https://www.epa.gov/system/files/documents/2023-03/Fact%20Sheet PFAS NPWDR Final 3.14.23.pdf](https://www.epa.gov/system/files/documents/2023-03/Fact%20Sheet%20PFAS%20NPWDR%20Final%203.14.23.pdf)

PFHxS, GenX (HFPO-DA), PFNA, and PFBS – 1.0 Hazard Index (unitless)

If finalized at these concentrations, we expect many more public water systems will require PFAS treatment, and all PFAS treatment operating costs will increase. While the EPA currently estimates annualized costs in the range of \$750 Mm, actual costs many times this amount – along with issues such as carbon and resin supply chain and residuals disposal – are expected. The price and feasibility to treat PFAS to such low levels raise serious and significant issues for the public water sector and the consumers that we serve. NHHWA will work closely with all our sector partners to advocate for science-based decision making through the rulemaking process, and will keep you informed and engaged to support our advocacy with your perspective.

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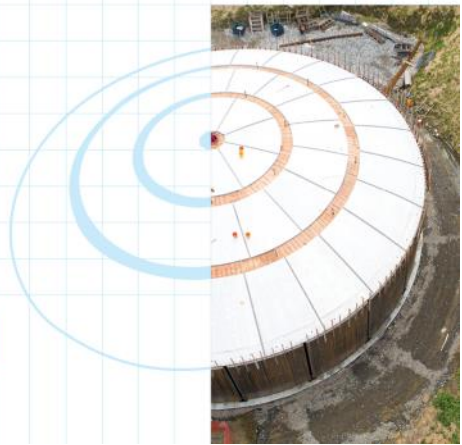
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