NHWWA
NH WATER WORKS ASSOCIATION

# Journal

## Volume 2, Fall 2024

Equipment in the new Allenstown Community School's water room. Inside, read more about the design and construction of the water system for this new school.

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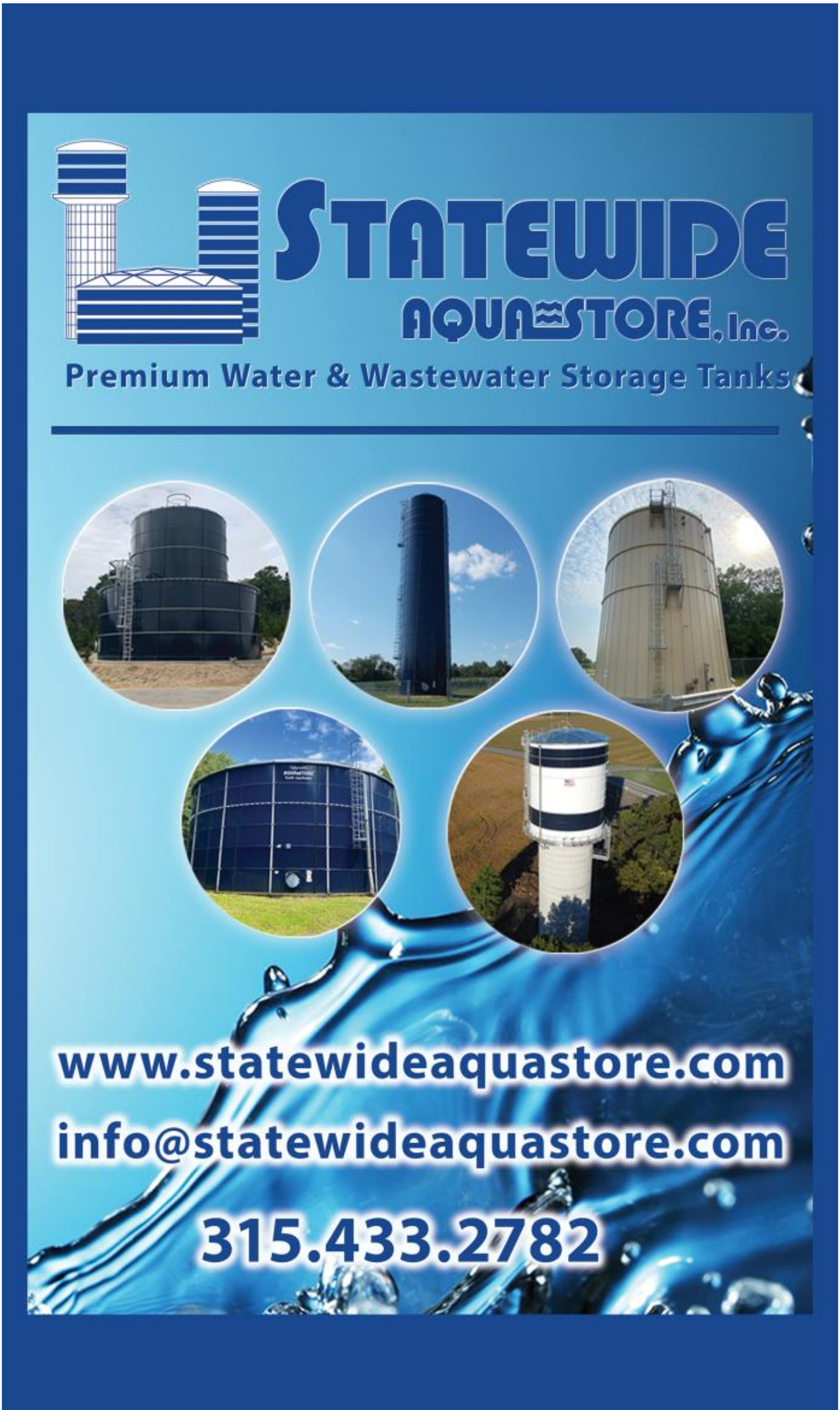

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# JOURNAL

**Volume 2, Fall 2024**

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

# 2024 New Hampshire Water Works Association Board of Directors and Staff



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**NEW HAMPSHIRE WATER WORKS ASSOCIATION**
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# Inaugural Leadership Summit

## For NH's Drinking Water Leaders

On Thursday August 29th, NHWWA held an Inaugural Leadership Summit. The goal of this summit was to provide an opportunity for mangers and superintendents in the water works industry to elevate themselves as leaders.

*Congressman Chris Pappas and NHWWA PCEO Sam Currier.*

We kicked off the day hosting a one-on-one interview with Congressman Chris Pappas. Congressman Pappas gave us a good oversight into what has been happening at the Federal level along with some of the things to look forward to in the upcoming sessions in DC. I would personally like to thank Congressman Pappas for taking time out of his day to join us, both during the interview and the time he spent talking to the leaders in the room.

Throughout the day, we provided opportunities for managers and water superintendents to discuss issues they face day to day. Our partners at NHDES gave a presentation about NHDES funding opportunities and reviewed upcoming legislation concerning water and wastewater. Throughout the presentations from NHDES, there is one thing that was made very clear - NH Department of Environmental Services is exactly that, here to serve. We in New Hampshire are very fortunate to have a state agency that wants to work alongside us as operators and to figure out what's best for our communities. A huge thank you to all the people from NHDES who helped the day go smoothly.

As I was picturing what this day was going to be, I wanted to make sure I included stories of people's journeys. Can someone's story address questions like "what makes you a leader", "what makes you a better leader", "if I am a leader, how do I know I have the right team", and "how can I keep that team"? And then also, "can I improve my team to a point where I'm okay losing someone"? We found just that person in Dr. Mirka Wilderer. She is the new CEO of Aqueous Vets, and she showed us how she was able to work through her career to become a CEO and then building from her experiences, create the core nucleolus of employees that she has in her company now. This really opened the door for conversations we had the rest of the day.

After lunch, NHWWA's own Young Professionals Committee Chair, Sarah Jakositz tackled the topic of workforce development. Sarah dove into some very hard conversations involving the expectations workers from different generations have when entering the workforce today. As you can imagine, this really sparked some conversations. When values are different between two people it can be difficult for them to view both sides evenly. It can be even more difficult when these two sides are not just two people, but management and staff. Sarah was able to present and have an open discussion with water works leaders that developed into a healthy conversation that expressed that there is more to work than punching in and out every day. Sarah Jakositz's presentation was top tier! If you missed it, don't worry – this is something we will offer again somewhere soon!

We ended our day with Jason Gagnon from the North Conway Water Precinct presenting a managerial outlook on budgeting, going past the budget. Jason talked about community, and what things you can do when looking to get voters on your side, steps you can take to improve your chances of getting things passed. Jason dove into the idea of opening up to the community and knowing who the players are in your city/town. Infrastructure gets older and needs repairs and operating our plants costs more because of post COVID pricing and inflation. Jason gave us lots of insight into all of these points.

I could not be happier to say that the Leadership Summit will be happening annually. I felt, as we went through the day, that all presentations were strong and engaging. And it didn't matter if you were a Grade 2 Operator just taking over your first small sized system or if you had been in the industry for 30 some years, there was something here for you to learn. As I continue my goal at New Hampshire Water Works Association to bring new energy to the way that we learn and the way that we grow as leaders, my plan is to continue to focus on growth for you, your city/town admins, commissioners, your employees and your communities.  Everyone has the ability to improve and grow.

*'Only the guy who isn't rowing has time to rock the boat.' – Jean-Paul Sartre*

-Sam Currier, President and CEO
NH Water Works Association

*Pat's Peak provided a beautiful setting for the summit and attendees were able to gather outside and enjoy the later summer day.*

# Allenstown's New K-8 School is OPEN Supplying Quality Water Service to this NTNC Public Water System

Bruce W. Lewis, P.E.
Lewis Engineering, PLLC

## Introduction

The following is from a local area newspaper - "Jaws dropped and cheers erupted as Allenstown students entered their new school building for a walk through for the first time on Thursday morning April 18th. Some students exclaimed, "Yo, this looks like a mall!" while others observed the familiar 'new school smell.'" And guess what? Opening day was May 3rd.

Statistics on the new Allenstown Community School are that "it is an impressive 83,000-square-foot building located at 171 River Road. It's just a six-minute drive from Allentown's town center. The project cost a total of $33 million dollars, with approximately 60% of the funding coming from state aid. The school will accommodate all 335 students from kindergarten through eighth grade."

Doug Proctor from the H.L. Turner Group design firm in Concord reported at a recent meeting that "the first level comprises all the common spaces for the school, as well as the kindergarten through fourth grade, which is the elementary school. The second floor is comprised of the middle school, grades 5 – 8. This level also includes a family consumer science lab, and many makerspaces and robotics labs

*Allenstown SAU 53—New K-8 Community School. Go Eagles!*

and technology labs." The school's Civil Engineer was Wilcox and Barton of Concord, Erin Lambert, V.P. lead engineer, and the General Contractor was Milestone Engineering and Construction of Concord. Matt Beaulieu was the Project Manager.

This part of Allenstown has no municipal water available. As such, the school's new water system had to be fully developed on site. The school's water system is regulated by the NH Drinking Water Groundwater Bureau (DWGB) as a Non-Transient, Non-Community (NTNC) water supply. This category of public water system is one that regularly supplies water to at least 25 of the same people for at least six months per year. These systems have specific requirements for operations, sampling, monitoring, reporting, and public notifications. The design regulations for this type of system are primarily found in Env. DW – 406, 503 & 602. Lewis Engineering worked closely with NHDWGB, the H.L. Turner Group, Wilcox and Barton, and Milestone Engineering and Construction to meet and address the challenges that were presented during the design and construction of the new waterworks facilities.

A portion of the mechanical room inside the school was set aside for domestic water related equipment. Smith Pump Company of Hooksett provided all equipment, fit-up, and start-up for the water system. Secondwind Water Systems of Manchester was retained as the school's Certified Water System Operator.

The overall site design was carefully shaped as the areas around the infrastructure and school building had abundant wetlands issues that were competently addressed. In addition, the general groundwater table in the area is high. From the waterworks perspective, locating potential well sites meeting wetland setbacks, as well as having approvable Sanitary Protective Areas (SPA's) took careful planning. There is a portion of the school's soccer field that has a restriction against the application of any herbicides, fertilizers, or pesticides as it falls within the SPA of the well being used by the school for its domestic drinking water. A second challenge from the high groundwater issue was that additional under drain had to be designed and installed in the area of the buried reinforced concrete potable water atmospheric storage tank. The design efficiently and effectively lowers the level 4+ feet, keeping it below the bottom of the tank. (Thank you Erin Lambert). The school's Fire Protection system, which has its own set of buried cisterns, with a fire pump room, benefited from having the groundwater table lowered as these cisterns are in the same general area as the school's atmospheric storage tank. The third challenge was that water quality from the water supply well required treatment for arsenic and was found to have a very high level of naturally occurring radon which was reported at 96,600 picocuries per liter. The final challenge was proper disposal of backwash water from the filtration system which was solved using an in-ground infiltration system.

## OVERVIEW DESIGN AND OPERATIONAL SUMMARY

### Water Supply

The school had two well locations sighted and approved. Following completion of the drilling of the first well with testing and water quality analysis being completed, it was determined that this well would provide sufficient water for the school. The second well site is available for use in the future if it is ever required as it meets all site location rules.

*Buried 5,000 gal. Atoms. Tank with vented HDPE Booster Casings with twin 2-hp VFD submersible booster pumps. Gate Valve, and aluminum access hatch with access ladder. Behind, the combination screened vent & overflow with a 2" cam-lock emergency fill with locking cover.*

The well is set up to operate based on pressure using an automatic ball valve, and a 119-gallon pre-charged pressure tank. A variable speed well pump was installed and is programmed to provide a fixed number of gallons per minute into the school when it is running. The pump normally starts based on the level of water in the atmospheric storage tank located outside the building. A 2-inch polyethylene well line was run between the school and the well. Electrical wiring was run in parallel using schedule 40 PVC conduit. A frost sleeve was installed at the casing where the conduit enters the well cap. The wire between the top of the well and the well pump, which is set at 125 feet, is flat-jacketed PVC encased copper, three wire plus a ground. All well water is metered and recorded as it enters the school.

## Water Treatment

As water enters the mechanical room through a 1” Badger M2000 magnetic meter, a low dose of chlorine is automatically added using a Stenner variable speed chemical feed pump paced by flow from the well to aid in the removal of low levels of iron and manganese. The water flows through REPCO twin 24” Greensand+ filters.

The filters are automatically backwashed based on time controlled through a programmable meter head on each filter. Backwashing uses fully treated water. The backwashing of each filter flows at a rate of 38+/- gpm, with a total backwash cycle using 760+/- gallons of water per filter. All backwash water flows through a 40-micron bag filter. A 1” Badger M-2000 water meter records this water. The water is discharged from a 1-1/2” schedule 80 pvc pipe into an elevated wall mounted 4” standpipe. The standpipe flows by gravity into a 2” PE 200 psi pipe that runs the length of the school under the floor slab, exiting the building and running into a buried 500-gallon reinforced concrete infiltration dry well.

Following the filters, water travels through Met-Sorb arsenic removal media. The treated water enters a Massei venturi aeration unit for radon mitigation. Water leaves the mechanical room and runs into the buried atmospheric storage tank. A second radon aeration device, a Bete 1” passive spray aeration nozzle, is ceiling mounted in the center of the atmospheric tank for additional Radon mitigation. The tank has an access hatch and a screened vent, with an emergency fill connection, and a screened overflow.

## Water Storage and Booster Pumps

Based on the results of the well testing, and assessment of schools of a similar population, a 5,000-gallon reinforced concrete buried atmospheric tank was installed. The tank contains fully treated water. There is a submersible 0 – 5 psi pressure transducer that provides data into the automatic control panel to monitor tank level (inches of water), provides alarm set points, and starts and stops the well pump based on tank level.

Water from the tank flows into twin submersible booster pumps adjacent to the tank. Each is mounted vertically inside a high-density polyethylene (HDPE) pump casing. There is a gate valve separating the booster pumps' casings from the tank. The submersible boosters are 2 h.p. – 35 gpm series stainless steel. The pumps operate automatically based on pressure and flow measured inside the mechanical room. These pumps run lead- lag / auto-alternate after each run cycle. The piping from each of the booster pumps into the school is 2" diameter 200 psi PE pipe. There is a pre-charged 119-pressure tank that allows booster pumps to be "off" during low to no demand periods. The piping with valves, fittings, and miscellaneous parts is connected into the school's plumbing system. Water pressure into the school varies 65 - 70 psi. A 0 – 100 pressure transducer is used to start and stop the VFD booster pumps. All water entering the school is metered through a 2" Badger M-2000 meter and recorded.

## Automatic Controls for Operations

R.E. Prescott of Exeter, NH (REPCO) manufactured and provided the School's VFD / PLC automatic control panel which is used to automatically operate the water system. A single 208v-3 phase circuit from the school's main circuit board runs to a terminal connection inside this UL508C listed panel. Power for the Well Pump and the booster pumps come from the panel's variable frequency drive (VFD) controls.

All pumps have a Hand-Automatic-Off (HOA) switch, and potentiometers that allow manual adjustment of pumps in the Hand mode. There is also an HOA switch for the automatic ball valve associated with the pressurized well water supply. This uses a pressure switch and a pre-charged 119-pressure tank for its operation. The well

*Automatic control panel. Operator Interface Unit (OIU) with touch screen showing the main screen*

operates "on – 60 psi and off – 80 psi" based on the level of water in the atmospheric tank. Having the well using a pressurized system allows untreated well water to be available to the soccer field's yard hydrant, and for manually "topping off" of the automatic fire sprinkler pumping system's cisterns as needed from time-to-time following scheduled testing of the schools automatic fire sprinkler systems.

The control panel has a 10" operator's interface unit (OIU) with a color touch screen, and a reset button. The booster pump VFD's are located inside the panel, with the programmable logic controller (PLC), and other equipment. All pressure transducers are wired into the Panel. There is a cellular telephone based Generating Solutions GS-300 RTU inside the panel. Analog monitoring and recording of Well Water coming into the station, and water entering the school building is

provided, along with several discrete alarm closures. A low temperature alarm, and a room flood alarm are provided. The atmospheric tank's level is shown on the OIU, along with system pressure, and other operational items. Additional electrical items include: 120 VAC outlets – 1 per filter, 1 for each of the 3 - M2000 water meters, and 1 for the flow paced chemical feed pump.

**Conclusion**

During the design, construction, and start-up of this new state of the art school water supply system, there were some interesting challenges to be resolved. Working together with highly qualified and capable designers, State regulators, a first-rate architect, general contractor, suppliers, and installers, the school is now complete and occupied. It was a pleasure to be part of this team effort. The goal of providing this new Community K-8 School for SAU-53 teachers, staff, and students was accomplished and ready to operate for the May 3rd opening date, and for many years into the future.

*Bruce W. Lewis, P.E. is the Manager of Lewis Engineering, PLLC. The company's in-home offices are in Litchfield, NH. Over the course of his career, for almost 50 years, Mr. Lewis has been associated with a broad range of waterworks engineering, operation, and construction projects. He is currently continuing to work on semi-retirement, but may be contacted by e-mail at lewis.h2o@comcast.net, or by telephone at 603-886-4985.*

# NH DRINKING WATER EXPO & TRADE SHOW

## THURSDAY, OCTOBER 24, 2024

## 8:00 AM—4:00 PM

## Grappone Conference Center, 70 Constitution Ave., Concord, NH

Our annual Expo & Trade Show is coming up fast! We will have 10 seminars on a variety of drinking water topics. Seminars will be held two-at-a-time throughout the day. **Earn up to 5 TCHs**. Coffee, Danish and hot lunch provided.

$125 NHWWA Member / $150 Not Yet Member

Download the EVENT BROCHURE from our website for a full schedule.

Visit our website to register NH Drinking Water Expo & Trade Show Attendee Registration - New Hampshire Water Works Association (nhwwa.org)

**THANK YOU TO THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES FOR SUPPORTING THIS EVENT!**

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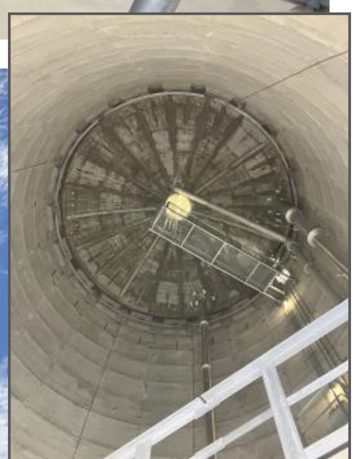
# Construction Day 2024

We started off Construction Day 2024 with a tour of Dover's new Pudding Hill Treatment Plant and recharge station. We then traveled to the newly constructed elevated composite tank off Webb Place in Dover.



Rochester stops included a tour of the Rochester Treatment plant and a presentation on the recent expansions to their distribution system. Then we visited Rochester's Eisenhower Elevated Storage Tank—the tallest water tower in NH!

**Thank you to Dover and Rochester for hosting a great Construction Day!**

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Deadlines: Volume I - April 1 | Volume II - September 1

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