

JOURNAL OF

**NEW HAMPSHIRE
WATER WORKS
ASSOCIATION**



We will be returning to Manchester Water Works for this year's Construction Day on August 4. Above: Construction Day 2018 at the site of Manchester Water Works' 3MG tank being constructed next to an existing tank in Londonderry.

VOLUME 1 - 2021

BUILDING TANKS IS OUR PASSION

Knowing that every water and wastewater tank has its unique challenges and complexities, DN Tanks understands that building any tank structure takes coordination, communication and determination. At DN Tanks we partner with you throughout the design phase, the construction process and beyond. Our experienced design, project management and construction teams have the knowledge and passion to customize any D110 tank to your operational needs. With our "can do" attitude, we deliver more than just a tank.



Corey Meyers, P.E., Regional Manager
781.462.5319 | corey.meyers@dntanks.com | www.dntanks.com

Weston & SampsonSM

transform your environment



restore

enhance

sustain

maintain

- water systems
- PFAS sampling and treatment
- surface and groundwater supply
- source approvals and well development
- distribution system master plans and mapping
- water storage tanks
- resiliency and sustainability
- treatment facility design and pilot studies
- meters and meter reading systems
- environmental permitting
- rate and meter replacement studies
- water main cleaning and lining

800.SAMPSON
westonandsampson.com

Offices in Portsmouth and Manchester, NH and along the East Coast

an employee-owned company

WE BLEED BLUE...

RED, WHITE & BLUE



When you buy an **Aquastore®**, you purchase a product that is Made in America from a company that has **over 122 years' experience.**

CST uses American-made iron and steel in our tanks and manufactured goods, American-made aluminum dome materials, and American-made glass frit to produce our glass-fused-to-steel tanks.

CST AQUASTORE tanks are made in DeKalb, Illinois and always will be.

When looking to fulfill storage tank needs, contact Statewide Aquastore, Inc. at (315) 433-2782 or visit www.besttank.com

STATEWIDE
AQUASTORE, Inc.



Statewide Aquastore, Inc. | 6010 Drott Drive | East Syracuse, NY 13057 | Ph: 315.433.2782 | www.besttank.com
© 2016, Statewide Aquastore, Inc. Aquastore is a registered trademark of CST Industries, Inc.



**Journal of
New Hampshire Water Works Association**

Contents

Executive Directors Notes	page 7
New Water Works Operators 2020	page 9
FY2020 Summary Financial Report	page 10
Merrimack Village District's PFAS Journey -Chapter Two	page 12
by Michael Metcalf, P.E, Senior Project Manager, Underwood Engineers. Inc.	

SAVE THE DATES

Construction Day will be held on August 4 at Manchester Water Works.

NH Drinking Water Expo & Trade Show will be held on October 20 in Concord.

**New Hampshire Water Works Association
Board of Directors and Staff
November 1, 2020—December 31, 2021**

OFFICERS

President

Chris Countie, Pennichuck Water

Vice-President

Chris Albert, CSA Environmental Consultants, LLC

Treasurer

Sarah Lescault, Manchester Water Works

DIRECTORS

Rene Pelletier, NH Department of Environmental Services

Robyn Descoteau, NH Public Utilities Commission

Chris Vaughn, Secondwind Water Systems, Inc.

Chris Berg, Wright-Pierce

Jason Gagnon, North Conway Water Precinct

Jamie Stevens, City of Dover

Jennifer Mates, Exeter Public Works

Carl McMorran, Aquarion Water Company, Past President (Ex-Officio)

STAFF

Boyd Smith, Executive Director

Susan Kowalski, Office Manager

NHWWA PAST PRESIDENTS

<https://www.nhwwa.org/wp-content/uploads/Past-Presidents-of-NHWWA.pdf>

NEW HAMPSHIRE WATER WORKS ASSOCIATION

18 N. Main St., Suite 308, Concord, NH 03301

info@nhwwa.org | www.nhwwa.org

(603) 415-3959

Executive Director Notes

Thank you for supporting the NH Water Works Association. Your membership, advertising, sponsorships and technical training and event attendance make our work possible. In addition, the generous and cooperative knowledge sharing that is part of public water system culture is of great benefit to all of us.

This edition of the *Journal* features a terrific follow-up article about Merrimack Village District's response to the PFAS crisis, written by Mike Metcalf of Underwood Engineers, Inc. Many of you know Mike as a consummate professional that is generous with his time and ideas. We are grateful for the work he and his colleagues contributed to our state-of-the art understanding of this persistent and pervasive contaminant.

We are proud of our sector's response to the COVID pandemic, keeping the water flowing while weathering this ongoing storm. Attendance at our remote-platform classes and events has been steady and is growing as we learn to carry on in the face of change. We are excited by the opportunities for learning, both remotely and together, that we have scheduled for this year. With 2021 a license renewal year, we have plenty of opportunities for contact hours to satisfy your interests and needs. Please let us know what topics you want to learn more about and visit our website at www.nhwwa.org to plan your training schedule.

We are revising our web site with a completion date of June. Our goal is to make this an even more useful tool to communicate and share critical knowledge and information related to public water training, funding, communications and policy. We welcome all comments and input that make our web site a more useful tool for you!

Behind the scenes we are revising our bylaws and governance policies to align your Association with our 2020 strategic plan, and to create an even stronger and more effective organization. With these revisions, updating of the web site, and completion of our strategic and communications plans, we are laying a foundation to continue providing top-notch services to our sector for years to come. Please let me know if you have any questions about our goals and how we can meet them together.

In addition to our stellar Board of Directors – ably led by Board Chair Chris Countie – I want to thank our lead instructors Marco Philippon (Concord), Ian Rohrbacher (Rochester), Don Bunker (NEWWA) and Steve Del Deo (former NHWWA Director, semi-retired). Their talent, commitment and generosity make our training programs interesting, exciting and beneficial to all levels of Operators. I also want to express appreciation for our many partners at NHDES, who work in a collegial and educational manner to assist Operators in their efforts to keep the water running.

This year we are saying farewell to two of New Hampshire’s drinking water leaders. After three decades contributing to nearly every aspect of public water, Rick Skarinka will be retiring at the end of June. With shorter tenure but a remarkable legacy of positive impact and leadership, Water Division Director Tom O’Donovan will be stepping down at the end of May. We hope that Rick and Tom will continue to share their wisdom with us for a few more years, from wherever they end up hanging their hats!

We look forward to working with all of you to meet our shared commitment to provide clean, safe and affordable drinking water to nearly 550,000 customers through roughly 2,500 public systems. By focusing on workforce training and recruiting, infrastructure finance, and public communications services, we are proud to do our part.



Boyd Smith, Executive Director

New Water Works Operators in 2020

Despite the challenges posed by COVID-19 in 2020, the following operators were newly certified by examination or reciprocity, or advanced in their Treatment and/or Distribution grade licenses. CONGRATULATIONS OPERATORS!

LICENSED OPERATOR		TREATMENT GRADE	DISTRIBUTION GRADE
JOHN	ALESSANDRO		I
KARL	BOSTROM IV	I	
VERNE	BREHIO	1A	1A
MATTHEW	BUMFORD		I
DAVID	CHIARADONNA		III
ETHAN	DAVIO		I
GARRY	DINI	III	II
WILLIAM	DOHERTY	III	
SEAN	DONOHOE	I	
CHRISTOPHER	DUCHANAY		II
GEORGE	FLANDERS		I
NICHOLAS	HUNTOON		I
ADAM	JOHNSON	I	
JAYSON	KELLY	I	
MICHAEL	KNOX	III	II
ADAM	LEPREVOST	IV	III
CRAIG	MCGRAW	I	
ANDREW	MCKAY	II	
ERIC	MESSIER	II	II
MARC	MOORE		III
ROBERT	NASH	I	
PETER	NOURSE	II	
PHILLIP	PENDERGRASS	1A	1A
JUSTIN	SHAW	II	
SMITH	HAROLD		I
KEVIN	STETSON		II
THOMAS	SUPREY		I
GLENN	SUTSON	III	
RALPH	WESINGER III	II	II
DANIEL	WOJCIK JR	III	IV

FY2020 Summary Financial Report

2020 was a tough year for all of us, but we are pleased to share that your Association has weathered the storm, adapting to COVID as so many of you have also done. We began the year without an Executive Director, resulting in reduced payroll expenses for the first quarter. Our deep appreciation to Sue Kowalski, our Office Manager, and the Board of Directors for keeping things rolling! We adapted to COVID mainly by moving swiftly to an on-line training format that allowed us to continue providing relevant training from top-notch Instructors to help the certified Operator community maintain professional development credits and stay in touch with their colleagues around the State. We are grateful to our Instructors, our partners at NHDES, and all of you for meeting this challenge together.

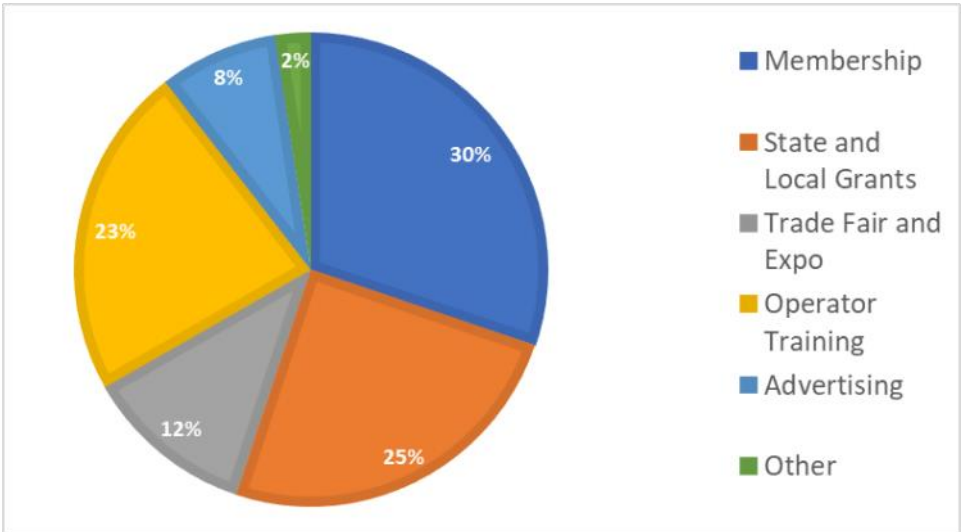
As COVID continued to impact operations into the Fall, we held our first “virtual” Trade Show and Exposition, a three-day series titled “Water Is Essential”, that offered three seminar tracks and a total of 12 approved contact hours, bringing some of the best and brightest of our industry regulators, operators and engineers to share their knowledge about challenges that we all are facing.

Fiscal year 2020 ran from November 1, 2019 through October 31, 2021. Our Revenue and Support (income) and Expenses for the year are summarized in the following charts. Gross Income was \$144,958 and total expenses were \$155,000, for a net loss for the year of \$10,042. Our cash position at the end of the year was strong, helped by the period of time without senior staff and by your generous support.

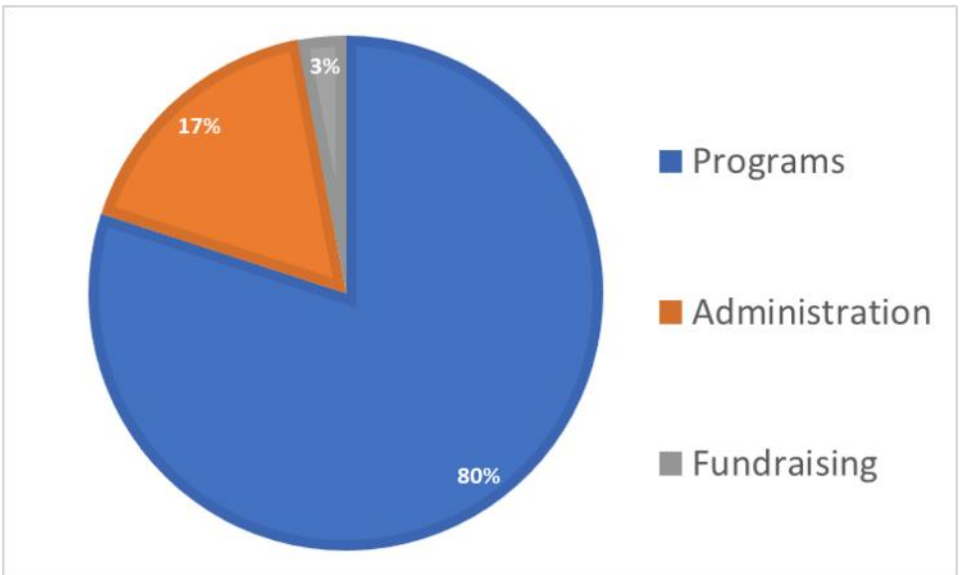
To better align our fiscal year with our revenues and expenses, the Board of Directors has authorized changing our fiscal year to a calendar year cycle, so that FY 2021 now coincides with CY 2021. While COVID continues to prevent us from the in-person gatherings we all enjoy, we are monitoring the situation closely and adapting our services to meet your needs as conditions evolve.

Thanks to everyone that has continued to support our Association through attending training, being a member, advertising with us, or sponsoring an event. We are stronger because of you, are more effective advocates for the drinking water profession, and encourage you to join NH Water Works Association if you are not yet part of our united and vigorous team!

NH Water Works Association Revenue and Support, FY 2020



NH Water Works Association Expenses, FY 2020



Merrimack Village District's PFAS Journey

by Michael Metcalf, P.E

Senior Project Manager, Underwood Engineers. Inc.

CHAPTER TWO

Introduction

In the March 2020 edition of the of the Journal of NHWWA (V.1-2020), Chapter One of Merrimack Village District's (MVD's) journey into the world of per- and poly-fluorinated alkyl substances (PFAS) was described. This article presents Chapter Two of this on-going journey. We refer the reader to the March 2020 article for details, but for context, a summary of Chapter One is given below:

- MVD Water System
 - ◇ Serves most of the Town of Merrimack, NH.
 - ◇ Groundwater system with six active wells (#2, #3, #4, #5, #7 & #8).
 - ◇ Prior to 2016, the only treatment was corrosion control and disinfection.
 - ◇ An Iron & Manganese Removal WTP was added at Wells #7 & #8 in 2016.
 - ◇ Current Avg & Max Day Demand – 2.3 mgd & 5.4 mgd respectively.
- PFAS are a class of chemicals used ubiquitously to make everyday products resistant to stains, heat, grease, oil and water. The strong carbon-fluorine bond makes them very stable, long lasting in the environment, and difficult to treat.
- Perfluorooctanoic acid (PFOA) was detected in the MVD system in February 2016.
- Subsequent sampling and testing showed PFOA and other PFAS compounds in all MVD's active wells.
- In May of 2016 NHDES adopted 70 ppt as an Ambient Groundwater Quality Standard (AGQS) for PFOA which is enforceable in NH as a Maximum Contaminant Level (MCL).

- MVD Wells #4 & #5 had PFOA concentrations above the AGQS and NHDES notified MVD that the wells must be kept off-line until treatment was in place.
- Granular Activated Carbon (GAC) contactors were selected for removal of PFAS.
- There was much public pressure to treat all MVD wells for PFAS regardless of the standard and in March 2019, warrant articles were passed to design and construct PFAS removal facilities for all MVD wells.
- In July 2019, NHDES adopted new lower standards for PFOA, PFOS and two other PFAS compounds which made treatment of all MVD wells a regulatory requirement due to PFOA concentrations.
- As of March 2020, (end of Chapter One), MVD had:
 - ◊ Completed construction of a new booster pump station from the Pennichuck Water Works (PWW) system to replace the capacity of Wells #4 & #5 if needed,
 - ◊ Initiated construction of the Well #4 & #5 PFAS WTP,
 - ◊ Completed final design of a PFAS removal addition to the Well #7 & #8 Iron & Manganese WTP,
 - ◊ Completed preliminary design of PFAS removal facilities for Wells #2 & #3, and
 - ◊ Secured over \$14 million in grant and loan funding through the NHDES SRF program and the Drinking Water Groundwater Trust (DGWT) Fund for PFAS related infrastructure.

March 2021 Update

Wells #4 & #5

The Well #4 & #5 PFAS WTP reached substantial completion and went online in October of 2020 and has been providing about 700,000 gpd of PFAS free water ever since. See **Figures 1 – 4** for photos from construction and startup of the WTP. The Well #4 & #5 site and WTP have the following major design components:

- Wells #4 & #5 normal yield = 625 gpm (0.90 mgd). Max short term yield = 870 gpm (1.25 mgd)

- The old Well #4 and Well #5 stations with the wells inside the buildings were demolished and replaced with submersible pumps, motors and pitless adaptors
- Replacement well for Well #4 (Well #4R), due to damaged/corroded screen
- 2,924 square foot (86 ft x 34 ft) concrete masonry unit (CMU) building with wood truss roof, asphalt shingles and vinyl siding
- One train of two 12 ft diameter, 26 ft tall GAC contactors (1,000 gpm capacity for train)
- Provisions for future resin or other treatment addition
- Chemical storage and feed rooms
- Mechanical room
- Electrical room
- Control/work room
- ADA compliant bathroom
- Sanitary sewer to Merrimack Sewer System (sanitary waste only)
- Infiltration basin for GAC backwash and filter to waste discharge

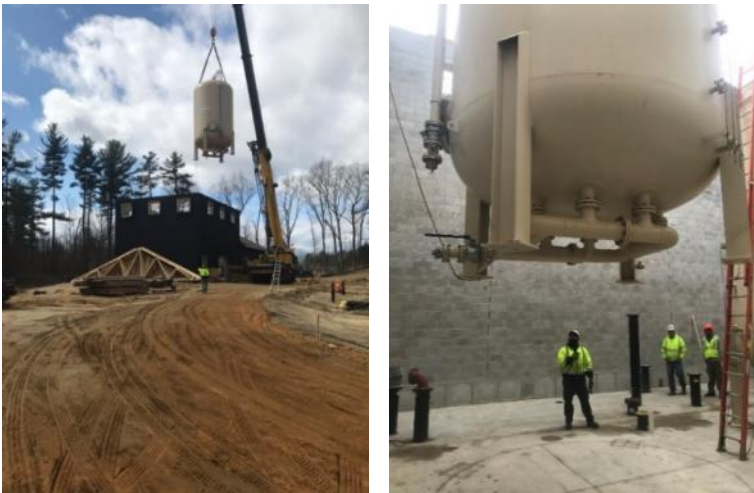


Figure 1-GAC Vessel Installation at Well 4/5 WTP



**Figure 2-
Completed Well
#4 & #5 WTP**



**Figure 3-GAC
Media Installa-
tion-Well 4/5
WTP**



**Figure 4-Initial
Backwash of
GAC at Startup-
Well 4/5 WTP**

GAC is highly porous with a large surface area to volume ratio. Contaminants such as PFAS are removed by being adsorbed, a process in which the contaminant molecules “stick” to the carbon due to electrochemical forces and are bound there. When the adsorptive capacity of the media is exhausted, contaminants will start to appear in the contactor effluent, which is defined as “breakthrough”, at which point the media needs to be replaced. Spent media may be disposed of or regenerated. GAC is not backwashed like filter media since the contaminants are bound to the media. Backwashing is only done once at startup to remove fines and stratify the bed (**Figure 4**).

The main design parameter for a GAC contactor is “empty bed contact time” (EBCT), or the time that the water is in contact with the media. This is nominally determined by dividing the volume of the empty media bed by the flow rate, but it is noted that different GAC’s have different densities so if a manufacturer indicates the pounds of GAC in a vessel, it is necessary to get the density to determine volume. The minimum recommended GAC EBCT for PFAS removal is about 10 minutes. The Well #4 & #5 WTP was designed to provide 10 minutes of EBCT at the peak flow of 870 gpm so at normal lower flows, the EBCT will be greater than 10 minutes.

The most important operating parameter for GAC is bed life since the largest O&M cost is replacement of this media. This is measured either as time to reach breakthrough or the number of bed volumes treated before breakthrough. Bed life is a function of the influent PFAS concentration, EBCT, and water quality, especially parameters that compete with PFAS for adsorption sites such as natural organic matter (NOM), sulfate, iron or manganese. The only way to definitively determine bed life is to conduct a pilot test to breakthrough, but this could take a year or more and is often not practical. Rapid Scale Small Column Tests (RSSCT’s) have been developed as a quicker way to verify PFAS removal and estimate bed life. This involves using columns less than 1 inch in diameter, GAC ground to a corresponding particle size, and a large sample of the raw water to be treated. This technique allows thousands of bed volumes to be treated much faster so that different GAC’s can be compared under the same water quality and conditions until breakthrough is achieved. The bed volumes from the RSSCT can be equated to the full-scale operation to estimate the bed life. It is

noted that bed life determined by an RSSCT is an estimate, and lab results do not always exactly match actual field results, but when there is limited time, it is currently the best tool available. RSSCT's were conducted on water samples from Wells #4 & #5, and eventually, all MVD Wells, to compare up to four different types of GAC. The RSSCT for the GAC selected for Wells #4 & #5 indicated a bed life of up to 20 months based on breakthrough of PFOA, the primary contaminant, but "short chain" compounds (currently unregulated PFAS compounds with shorter carbon chains) that are not removed as efficiently as longer chain PFAS compounds, may breakthrough by about 13 months.

The Well #4 & #5 GAC treatment train consists of the two GAC vessels to which water is fed in series in a lead/lag configuration. When breakthrough is either reached or approached on the lead vessel, the valve rack between the vessels (**Figure 5**) is used to change the flow direction so that the lag vessel becomes the lead vessel and the GAC in the former lead vessel can be changed out. Design of the GAC vessels includes the following sample taps:

- Raw water before lead vessel
- Points within the GAC bed of each vessel (25%, 50% and 75% of bed) (**Figure 5**)
- Midpoint between the lead and lag vessels
- Finished water after lag vessel

These sample taps are used to track the progress of PFAS adsorption through the bed and the train so that the switch from lead to lag vessel and media changeout can be scheduled at the appropriate time. A very important decision with regard to O&M costs is when to change the media. One approach is to wait until breakthrough of regulated contaminants to make sure compliance with the NH PFAS MCL's is achieved. Another approach, however, is to make the change when there is imminent breakthrough of any PFAS compound. Since short chain compounds will usually breakthrough first, this could lead to more frequent changeouts and higher costs. It is important to note that breakthrough in this discussion refers to PFAS entering the lag vessel, not the system. MVD's goal is non-detection of PFAS in water entering the distribution system.

At the time of publication of this article, the Well #4 & #5 PFAS WTP has been online for about six months. No PFOA has been detected within the lead vessel bed. Three short chain compounds have been detected in the top 25% of the bed and one short chain compound at the bed midpoint.



Figure 5-GAC Vessel Pipe Rack & Sample Taps- Well 4/5 WTP



Wells #7 & #8

Final design of the PFAS Removal Addition to the existing Wells #7 & #8 WTP (1,250 gpm (1.8 mgd)) Iron & Manganese Removal WTP was completed in March of 2020. Bids were opened on May 27, 2020 and the construction contract award was on July 21, 2020. Construction started at the beginning of August 2020 and substantial completion is expected in October of 2021.

Some challenges with design of this addition were:

- Limited area for expansion due to soil conditions and wetland constraints
- Height of the GAC vessels (26 ft) versus that of the existing GreensandPlus™ vessels (12 ft)

The geotechnical evaluation conducted for the design phase of the Iron & Manganese WTP revealed sands that could liquify during an earthquake which required soil stabilization using rammed aggregate piers for the entire building footprint. In order to provide expansion area for the Iron & Manganese WTP, additional soil stabilization was completed to accommodate a 48 ft x 34 ft addition. After the PFAS contamination however, the decision was made to use this area for PFAS treatment. To treat 1,250 gpm, two trains (two vessels/train) of 10 ft diameter GAC vessels (500 gpm/train) was not enough, so 12 ft diameter GAC vessels were evaluated (1,000 gpm/train). While the existing expansion area was sufficient for the smaller GreensandPlus™ vessels, it was not adequate for four 12 ft diameter GAC vessels and associated piping. Additional ground stabilization would have been required for a larger addition, and the 2,000 gpm of treatment capacity was much greater than required. Working with the GAC vessel manufacturers, it was determined that one train of 15 ft diameter vessels (1,500 gpm capacity) would fit in the available space. Vessels of this size require special trucking arrangements, mainly due to bridge clearance, but analysis of the route by the manufacturer indicated that these vessels can be shipped to the site, so the design was based on 15 ft diameter vessels.

Ion exchange resin, which uses smaller tanks than GAC, was considered for this application. However, the chloride levels in Wells #7 & #8 (about 100 mg/l) were such that the resin manufacturers contacted indicated that given such a high chloride to PFAS ratio (ppm vs ppt), the resin's ability to remove short chains would be

impacted and lead to shorter bed life than GAC. Additionally, resin cannot tolerate any residual chlorine in the water as it will damage the resin beads. Since there is chlorine in the GreensandPlus™ effluent, dechlorination would have been required with the use of resin, either through the use of chemical addition, or GAC.

A slab-on-grade construction was evaluated for the new addition, but the roof trusses of the existing WTP building were not sufficient for the additional snow load that may occur due to drifting snow that could pile up against the gable end of the new higher building addition. To reduce the height of the building to match the existing roof line, the floor of the addition was recessed to match the floor of the existing recycle basins, clearwell, and pipe gallery. **Figure 6** shows the difference in tank sizes and floor elevations.

See **Figures 7 & 8** for photos from construction of the Well #7 & #8 PFAS WTP addition.

Wells #2 & #3

Wells #2 and #3 are about a mile apart and have capacities of 1,000 gpm and 1,500 gpm respectively. The intent was to design a single PFAS WTP for both wells with a raw water main or mains from the wells to the WTP location. Well #3 has iron and manganese levels that are respectively as much as 4 and 17 times the secondary MCL's (SMCL's) so removal of iron and manganese is necessary before directing this water to GAC contactors. The Draft Preliminary Design Report completed in December of 2019 included a 120 ft x 66 ft (6,736 sq ft) WTP with four 10.5 ft diameter GreensandPlus™ filters for removal of iron and manganese from Well #3, and six 12 ft diameter GAC vessels for PFAS removal from both wells, along with three infiltration basins for both iron and manganese and GAC backwashing and filter to waste. The new WTP was to be sited near Well #3 with a raw water main from Well #2. Due to the Well #3 location near several busy interchanges, road salting has greatly increased sodium and chloride levels such that chloride is well above the SMCL. The size and expense of the proposed WTP along with the increasingly poor quality of Well #3 led to a decision to design and construct PFAS treatment for Well #2 only, initiate the process of installing a

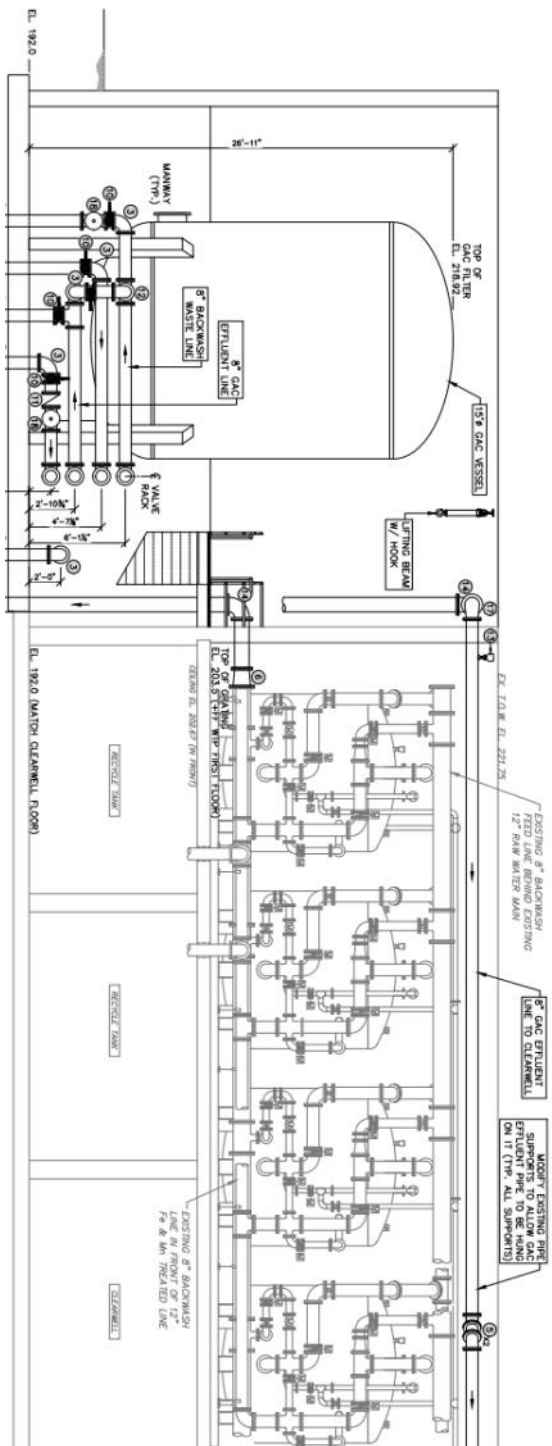


Figure 6-Elevation View of Well 7/8 PFAS WTP Addition



**Figure 7-Inside Well 7/8
PFAS WTP Addition**



**Figure 8-
Exterior of
Well 7/8 PFAS
WTP Addition**

replacement well for Well #3 and include capacity in the Well #2 WTP for flow from the new well, designated as Well #9.

Emery & Garrett Groundwater Investigations (EGGI, a division of GZA), MVD's hydrogeologic consultant conducted geophysics and test well work in the Naticook Brook Aquifer in which both Well #2 and #3 are located. A very favorable site was located on the north/west side of Naticook Brook about 1,000 feet from Well #2 (**Figure 9**). At this point, the Well #9 production well has been installed (18

-inch diameter, screened from 86 ft to 103 ft below ground) and EGGI is in the permitting process with NHDES.

Final design of the Well #2 PFAS WTP and related work was completed in January of 2021 which includes:

- 4,280 sq ft CMU building with wood truss roof, asphalt shingles and vinyl siding
- Four 12 ft diameter, 26 ft tall GAC contactors (2,000 gpm capacity)
- Chemical storage and feed rooms
- Mechanical room
- Electrical room
- Control/work room with storage
- Standby Generator
- ADA compliant bathroom and onsite septic system
- Infiltration basin for GAC backwash and filter to waste discharge
- 1,000 ft (+/-) raw water main from Well #9
- Cleaning and rehabilitation of Well #2, new pump and motor and replacement of process piping

Bids were opened for the project on April 26, 2021. Construction is expected to start in July with substantial completion expected in August of 2022.



Figure 9-Location of Wells #2, #3, & #9 (EGGI)

Costs

Table 1 presents the overall budget costs for the PFAS related infrastructure referenced in both the current and the March 2020 articles.

Table 1 – PFAS Related Budget Costs

Project	Budget
PWW Booster Pump Station	\$281,000
Well # 4 & #5 PFAS WTP	\$5,160,000
Well #7 & #8 PFAS WTP Ad-	\$5,100,000
Well #2 PFAS WTP	\$7,900,000
Total	\$18,441,000

The construction cost and current status for each of the three PFAS WTP's is given in **Table 2**.

Table 2 – MVD's PFAS WTP's Costs & Status

WTP	Construction Cost	Contractor	Expected Completion
Wells #4 & #5	\$4,043,243	Penta Corp	Online Oct 2020
Wells #7 & #8	\$3,540,300*	Infrastructure Construction	October 2021*
Wells #2 & #9	\$7,867,000*	Kinsmen Corp	August 2022*
Total Const. Cost	\$15,450,543		

*Projects not complete so figures/dates subject to change

MVD, with assistance from UE and EGGI has completed the discovery, evaluation and design legs of their PFAS journey. They are now in the construction phase, and of course the operational part of this journey will be on-going for many years to come, but by the fall of 2022 MVD is on track to achieve their goal of providing PFAS free water from all MVD sources.

Acknowledgements

The author gratefully acknowledges the following individuals for contributions to the content of this article:

- Ron Miner, Superintendent, MVD
- Jill Lavoie, Business Manager/Water Quality & Testing Manager, MVD
- James Emery, Dan Tinkham, Emery & Garrett Groundwater Investigations
- Keith Pratt, Peter Pitsas & Lynnette Carney, Underwood Engineers



ADVERTISING RATES—2021

JOURNAL ADVERTISING - two Issues per year.

	Cover Page	Full Page	½ Page	¼ Page	Business Card	Directory
Space Size	4.5" X 7.5"	4.5" X 7.5"	4.5" X 3.75"	4.5" X 1.7"	2.25" x 1"	Listing*
Cost / Year	\$400.00	\$300.00	\$175.00	\$150.00	\$100.00	\$100.00

The Journal is printed in color and mailed to NHWWA members. It is then posted on our website with a link shared with our broader email audience of 2,200. The online version will have imbedded links to advertisers' websites.

* The Directory of Manufacturers Listing includes the company's name, address, phone number, website, up to three representatives, and product listing.

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

NEWSLETTER ADVERTISING - 3 Issues per year.

Ad size: 2.5" x 1.75".

\$250/year

The Newsletter is electronic only. A digital version will be posted on our website and a link shared with our email audience of 2,400 NHWWA members, drinking water operators, managers, service providers and product suppliers. Ads will have imbedded links to advertisers' websites.

Deadlines: Winter - February 1 | Summer - June 1 | Fall - November 1

WEBSITE ADVERTISING

Medium Rectangle—appears on all pages

\$525/year

Footer Banner—three ad animation loop, appears on all pages

\$395/year

Ads will have imbedded links to the advertisers' websites.

DISCOUNTS

10% Discount for placing ads in both the Journal and Newsletter

10% Discount for placing an ad in one of the publications and on the website

20% Discount for placing ads in the Journal, Newsletter and on the website

Have questions about advertising? Contact Sue Kowalski at info@nhwwa.org

DIRECTORY OF MANUFACTURERS

COMPANY	CONTACT(S)	Chemical Feed	Controls	Fittings	Hydrants / Boxes	Meters / Gauges	Monitoring / Testing	Pipes / Couplings	Pumps	PWS Operators	Supplies	Tanks / Reservoirs	Tools	Treatment	Valves / Boxes	Water Testing	Wells
BARRETT ELECTRIC CO., INC. 34 Lock Road, Unit 2 Concord, NH 03301 www.barrettelectricnh.com	Chris Barrett 603-223-5004		X														
BAU/HOPKINS 310 South Street Plainville, MA 02762 www.bauhopkins.com	Bob Hopkins Gene Weeks 800-733-1860	X	X				X	X						X			
E. J. PRESCOTT, INC. 210 Sheep Davis Road Concord, NH 03302-0337 www.eiprescott.com	Kyle Rousseau 603-224-9545	X	X	X	X	X	X	X	X	X		X			X		
EPHING WELL & PUMP CO., INC. 337 Calef Highway (Rte. 125) Epping, NH 03042 www.eppingwell.com	Henry DeBoer 603-679-5299	X	X			X		X	X			X	X	X	X	X	X
MAHER SERVICES 71 Concord St. North Reading, MA 01864 www.maherserv.com	Peter Maher 978-664-9355 (F) 978-664-9356							X									X
SMITH PUMP CO., INC. 48 Londonderry Turnpike Hooksett, NH 03106 www.smithpumpnh.com	Jack Porter Steve Smith 603-669-9119		X					X					X		X		X
STATEWIDE AQUASTORE, INC. 6010 Drott Drive East Syracuse, NY 13057 www.besttank.com	Annie Wheeler 315-433-2782											X					
STILES CO., INC. 922 Pleasant St. Norwood, MA 02062 www.stilesco.com	Ian Kasowitz 781-769-2400	X		X	X	X	X	X	X	X	X		X		X		
STONKUS HYDRAULICS 166 Lakeshore Drive Blackstone, MA 01504 www.stonkus.com	Brian Stonkus 508-966-3844		X			X	X									X	
TI-SALES, INC. 36 Hudson Road Sudbury, MA 01776 www.tisales.com	Dave Harris 978-443-2002 (F) 978-443-7600	X		X	X	X	X	X	X	X	X	X	X		X		



STILES CO
SMART WATER SOLUTIONS



New England Authorized Waterworks
Distributor of Quality Waterworks Products
Serving Water Utilities Since 1983



HYMAX

922 Pleasant Street • Norwood, MA 02062 • 800-426-6246 • www.stilesco.com



TATA & HOWARD

**100%
EMPLOYEE-OWNED**

**SALEM, NH | 603.899.7588
WWW.TATAANDHOWARD.COM**



NHWWA

Advertise with us!
For advertising information check
our website at

<https://www.nhwwa.org/about-us/advertise-with-us/>

or call Sue at 603-415-3959



PROVEN SOLUTIONS
**PFAS AND EMERGING
CONTAMINANT REMOVAL**



evoqua
WATER TECHNOLOGIES

evoqua.com/PFAS
(833) 939-0314

You expect it to work



We make sure it does



**civil &
environmental
engineering**

underwoodengineers.com



Are Large Meter Inaccuracies Affecting Your Non-Revenue Water?



Large meters may make up only 10-20% of your inventory, but measure 60% (or more!) of your water consumption. Our water meter optimization program finds your non-revenue water.

[CONTACT US TO LEARN MORE](#)

 800.225.4616

 www.tisales.com/lmt

 metertesting@tisales.com



Grove Pond Water Treatment Plant, Ayer, MA

listen.
think.
deliver.

From bench-scale testing in our own Research and Testing Laboratory, to pilot studies, permitting, design, construction services, startup, and commissioning – **CDM Smith** has been a PFAS leader, developing some of New England's first Granular Activated Carbon (GAC) and anion exchange PFAS removal facilities.

For PFAS removal experience
New Hampshire communities can
count on, contact our local experts:

Alan G. LeBlanc, PE, BCEE
LeblancAG@cdmsmith.com
603-222-8380

Jihyon Im, PE
ImJ@cdmsmith.com
603-222-8356



Visit cdmsmith.com/PFAS



WRIGHT-PIERCE 
Engineering a Better Environment

Water, wastewater,
and civil infrastructure
services since 1947.

wright-pierce.com/careers



Certified Public Water Experts

We know water so you don't have to

SECONDWIND WATER SYSTEMS OFFERS:

DESIGN & APPROVAL SERVICES

SYSTEM OPERATOR & ADMINISTRATIVE SERVICES

TREATMENT INSTALLATION & MAINTENANCE SERVICES

- Certified
- Government Relations
- Lifecycle Info. Protection
- 24/7 Emergency Service
- 30+ Years in Business
- Systems Info. Protection

 **Secondwind**
water systems, inc.

603-641-5767

www.secondwindwater.com

Tighe&Bond

177 Corporate Drive
Portsmouth, NH
603.433.8818

Offices throughout
the Northeast

www.tighebond.com

WATER RESOURCES ENGINEERING

Asset Management

Dams &
Geotechnical

Energy &
Sustainability

Funding & Rates

Hydraulic Modeling

Pumping &
Distribution

Storage

Treatment

Water Supply



Water & Pump Services

Water & Septic Pumps • Pump Control Systems
Water Filtration • Treatment • Conditioning • Chlorination
Iron, Manganese, Radon, Uranium, Arsenic Removal
Operating Community Water Systems • Certified NH & ME

FXLyons

Route 16/302
Intervale, NH

Inc. www.fxlyons.com

LICENSED
PUMP
INSTALLER

24-Hour Service 603-356-6767

F.G. Sullivan Drilling Co. Inc.

Municipal ~ Industrial ~ Irrigation

**GRAVEL WELLS ~ TEST BORINGS
WELL RECONDITIONING ~ PUMPS**

Frank Sullivan Jr.
394 Parker Road
Lancaster, MA 01523

Tel. (978) 365-2932
Fax. (978) 368-8716
Cell. (978) 423-9688

Email. frank@fgsullivanadrill.com

MAHER

services 

Third generation of Maher's servicing
New England's water needs since 1941.

- Pump Sales & Services
- Well Drilling, Rehabilitation & Maintenance
- Pantomite for Cleaning & Disinfecting Wells/Water Storage
- SiLibeads Engineered Filtration Media

978-664-9355 • www.maherserv.com



GEOSPHERE
ENVIRONMENTAL MANAGEMENT INC.

NEW HAMPSHIRE
MASSACHUSETTS
(603)-773-0075
(888)-838-6571
WWW.GEOSPHEREINC.COM

GROUNDWATER SUPPLY
ASSET MANAGEMENT
SITE ASSESSMENTS
LSP SERVICES
GIS MAPPING


PROFESSIONAL CONSULTANTS PROVIDING
GROUNDWATER & ENVIRONMENTAL SOLUTIONS

Paul Whittemore

Toll Free (866) 632-1497
Office (603) 689-4004
Cell (603) 486-8049

New England Backflow Inc.

Inspecting • Testing • Repairing
Backflow Devices



Certified • Fully Insured P.O. Box 528 Auburn, NH 03032



Thank you water professionals!




Eastern Analytical, Inc.
professional laboratory and drilling services



(800) 287-0525 EasternAnalytical.com

A World of Thanks for your Patronage



Bruce W. Lewis, PE



ARCHITECTS
ENGINEERS
BUILDING SCIENTISTS



Gerard R. Blanchette, P.E., NCEES, LEED AP
President | Principal
gblanchette@hturner.com
603.228.1122 ext. 120



Chris Barrett
603-223-5004
Cell: 603-765-3566
Chris.Barrett@BarrettElectricNH.com

Electrical Instrumentation Controls

P.O. Box 2338
34 Locke Road, Unit 2, Concord, NH 03302
www.BarrettElectricNH.com



CAI Technologies
Precision Mapping. Geospatial Solutions.

Leveraging Technology for Powerful GIS Solutions.

11 Pleasant Street
Littleton, NH 03561
P (603) 444-6768 / (800) 322-4540
cai-tech.com

Core Services:

- Geographic Information Systems
- Municipal Mapping
- Utility Infrastructure Mapping
- Customized GIS Solutions
- Web Solutions

EXPERTISE. INSIGHT. INNOVATION.
We Deliver on Your Water Challenge.



KLEINFELDER
Bright People. Right Solutions.

www.kleinfelder.com



AD Instruments can put you on our semi-annual inspection schedule to assure that your system is being monitored accurately and all sensors are operating properly.

238 S. Main Street Newton, NH 03858
Ph: 603-382-4667 Fax: 603-382-4608

GOT

SCADA?

Let Us Make It Work For You!

Our technicians can help you improve the performance of your SCADA system.

Service Contracts ~ Flow, Level, Telemetry ~ Pump & pH Control ~ VFD's ~
SCADA ~ Programmable Controllers ~ Experienced Staff ~ Personal Service ~
Competitive Prices ~ Large Parts Inventory ~ Fully Insured and Bondable

email: adinstruments@comcast.net

"Original"
The  Water Professionals

www.eppingwell.com



337 CALEF HWY, EPPING, NH 03042
26A MAIN STREET, PITTSFIELD, NH 03263

Water Pumps, Sales & Service
Accredited Water Analyses
Water Treatment Design and Installation
Public Water System (PWS) Operators
New PWS Source Permitting
PWS Aquifer Optimization/Source Capacity
Irrigation System Design and Installation



800-287-5299



GeoInsight®

Environmental Strategy & Engineering
Practical in Nature



Water Resource Specialists

- Water Supply Services
- Aquifer & Surface Water Modeling
- Source Area Identification
- Wellhead Protection Area Delineation
- Supply Well Permitting
- Litigation Support
- Contamination Evaluation & Assessment
- Pumping Tests
- Storm Water Management
- Facility Audits / Compliance

David A. Maclean, P.G., L.S.P., L.E.P.

(603) 314-0820

damaclean@geoinc.com

www.geoinsightinc.com

NH * MA * CT

global expertise delivered locally

asset management

steel & concrete tanks | treatment plants | pipes | meters

water quality in distribution systems

in-tank water mixers | trihalomethane removal systems
disinfectant residual | control systems

smart metering services

Advanced Metering Infrastructure (AMI)
smart meters | managed services | performance guarantees

CONTACT YOUR LOCAL
WATER SYSTEM CONSULTANT

Scott Kelley

855-526-4413 | ask@suez.com

www.suez-na.com



An ISO 9001:2015 Quality Assured Company



**Introducing
AMERICAN Flow Control®
Series 2500
with ALPHA™ Ends**

ALPHA™ is a licensed trademark of Fomac Industries, Inc. (U.S. Patent 8,894,100)

AMERICAN Flow Control recently unveiled the ALPHA Restrained Joint product line consisting of Series 2500 Resilient Wedge Gate Valves in sizes 4"-12" as well as American-Darling and Waterous fire hydrants. Compatible with multiple pipe materials, ALPHA can be quickly and easily installed by one person with one stainless steel bolt.

Contact your local Team EJP sales representative to learn more!



WATER • WASTEWATER • STORMWATER
SOLUTIONS

**1-800-EJP-24HR
EJPRESCOTT.COM**

Concord, NH
603-224-9545
W. Chesterfield, NH
603-256-6466

WHATEVER YOU NEED, WHENEVER YOU
NEED IT, NO MATTER WHAT.

***Call Dig Safe[®]
before you dig.***

IT'S SMART, IT'S FREE, IT'S THE LAW.



DigSafe

MA • ME • NH • RI • VT

Call **811**
digsafe.com



New Hampshire Water Works Association
18 N. Main St., Suite 308
Concord, NH 03301

NONPROFIT ORG
US POSTAGE
PAID
CONCORD NH
PERMIT NO 990

Or Current Resident