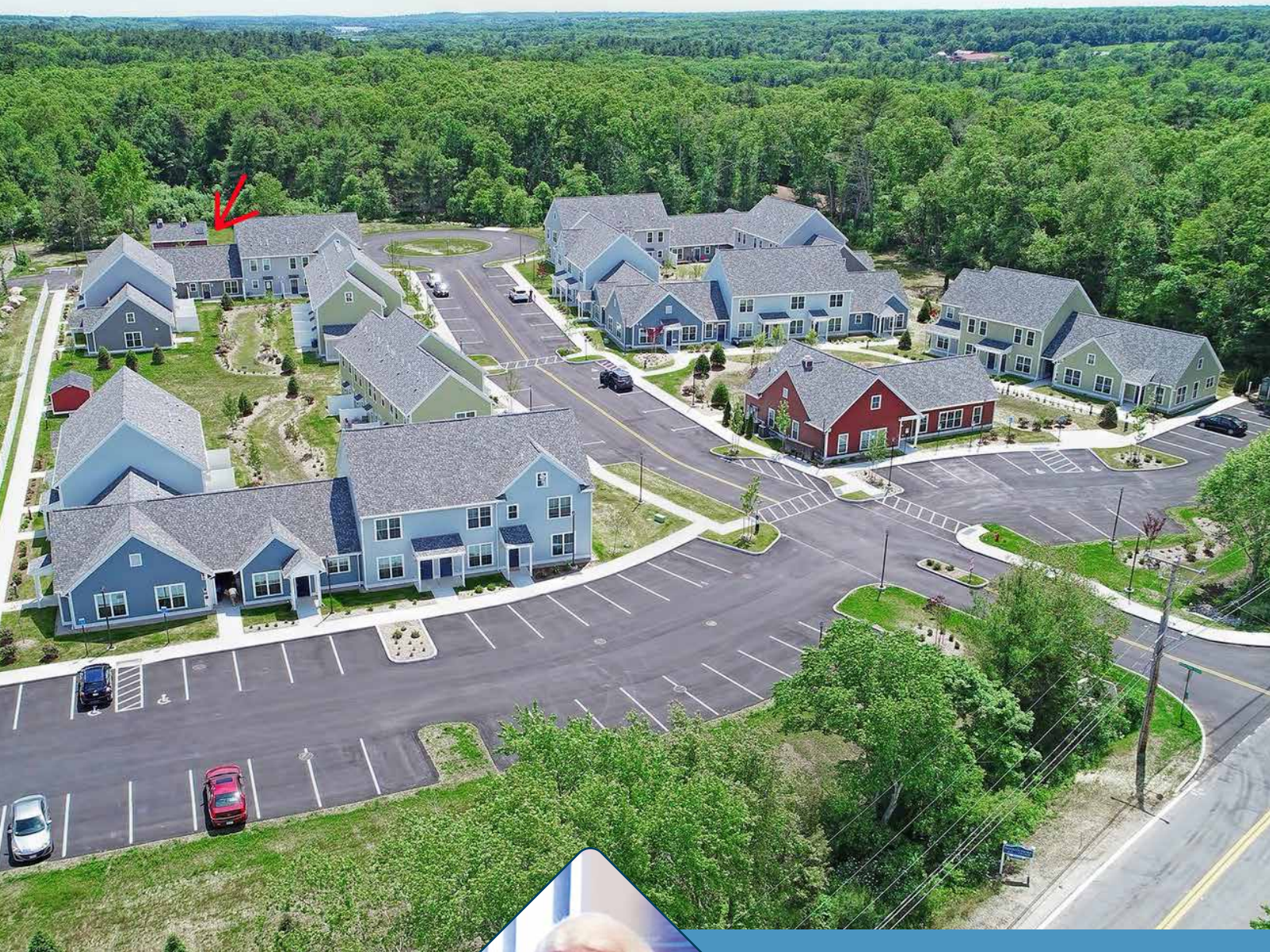


# THE Onsite Journal

## **CASE STUDY: Noquochoke Village Affordable Housing Project, 10**



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**SUMMER 2022**



**TRIBUTE TO JAMES CRUVER,  
FOUNDER OF SALCOR, INC, 16**



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## NEW EMERGING PROFESSIONALS COMMITTEE

We are pleased to announce the formation of a new committee within NOWRA - the Emerging Professionals Committee. This committee was formed after interest and discussions with young professionals at the 2021 Onsite Wastewater Mega-Conference. NOWRA defines an Emerging Professional as a student, a young professional, or a new professional to the onsite wastewater treatment field.

The Mission of the committee is as follows:

NOWRA's Emerging Professionals Committee is dedicated to work-force development, recruitment, and advocacy on behalf of young and early career professionals in the onsite wastewater treatment sector.

If you are interested in finding out more, or joining this committee, please contact the Chairperson, Robert Bair, at [rbair@usf.edu](mailto:rbair@usf.edu).

For more information on any of NOWRA's Committees, check out our Committee web page or email the NOWRA office at [info@nowra.org](mailto:info@nowra.org).

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WASTEWATER RECYCLING ASSOCIATION**



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## EXECUTIVE DIRECTOR'S MESSAGE

### Thomas Groves, Exec. Director

As we get into summer, NOWRA will be focusing the majority of our attention on the upcoming 2022 Onsite Wastewater Mega-Conference. We are excited to host the conference this year with one of our most active state affiliates, the Missouri Small-flows Organization (MSO). We received dozens of interesting topics and presentations for this year's event, so you won't want to miss out. New for this year will be a Poster Contest for Emerging Professionals in the onsite wastewater field. This is a new and active committee within NOWRA that is bringing a breath of fresh air into our profession.

The Mega-Conference wouldn't be the Mega-Conference without an awesome social event and educational field trips. This year's conference falls on Halloween, so the social event will capitalize on this special day. The field trips will not only feature the latest and greatest in technology and onsite wastewater solutions, but will also include geological features such as caves that are specific to this region. The planning committee is hard at work, so watch for more details to come – you won't be disappointed!

The first six months of 2022 has been a continuation of a record year for online training for NOWRA's Online Learning Academy. More and more professionals are turning to NOWRA's online courses to help them achieve the training hours that they need for their license or certification due to the variety of topics offered, easy to use/flexible format, and cost per training hour. We are currently working on additional modules for our popular Design Course based on presentations given by NOWRA at the 2022 WWETT Show.

The next issue of the Onsite Journal will be our annual special pre-conference issue. I hope you enjoy our publication. We have worked hard on making this magazine a timely, informative, and technically relevant professional journal. Much thanks for this goes out to our Onsite Journal Committee and our editor. If you have any feedback on the Jour-

nal, please send them along to me at the NOWRA office. We are always looking to improve.

Unfortunately, our industry recently lost another well-respected, well-liked, and loyal NOWRA supporter in Dr. Jim Cruver. Anyone who had the opportunity to meet with Jim and his side-kick/wife Sally, knows what a loss this is to our field. They were both staples at NOWRA events. For more on Jim's life and career, check out the article on page 16.

Thank you for allowing me to serve as Executive Director of this great organization.

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# A NOTE FROM THE PRESIDENT

## Staying Safe

As the spring turns into summer our industry really picks up with septic system installation across the country. It is a great time to remind ourselves that the work we do is vital to projecting public health but that are risk both to ourselves while constructing systems and the users who live with these systems.

On the construction side, cutting corners, rushing through tasks and not following safety requirements can all create a situation where an employee, family member, and friend could be injured during a septic system installation. We have all seen situations where we were nervous - these are the times to slow down and do things right as the risk are too great. NOWRA currently now has over 6,000 members and the last thing we want is for any one of them to lose their life due to a safety related issue!

The other large safety issue I want to address which has made the news relates to tank lids. In May, a toddler died in South Carolina and in March a similar accident occurred in Florida. I honestly do not believe many property owners understand the risk in their backyard with septic tanks typically containing 3-5 feet of liquid.

As an industry, during times of maintenance and inspection we need to point out this risk and assure that the lids are safe and secure when we leave the site. For new construction there is a growing consensus that secondary restraint should be installed at the time of construction and verified over the life of the system during maintenance. As NOWRA professional members working in your home states as regulations are being updated this is an item that should be considered to avoid losing the lives of children and pets.



**Sara Heger, President**

I also want to take this opportunity to express my condolences to the Cruver/Salcor family. Jim Cruver was a brilliant man dedicated to advancing our industry. He never lost his lust for learning and a new experience and was always willing to donate his time and resources to advancing NOWRA's mission. In addition, he was simply one of the nicest people I have met. When I would see him and Sally walking my way in their purple shirts, I always knew a good conversation was in store and I will miss those dearly.

**SAVE THE DATE!**  
**SepticSmart**  
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**September 19-23, 2022**

**Get ready for the**  
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**of SepticSmart Week!**

This year SepticSmart Week celebrates 10 years of outreach and education activities that encourage homeowners and communities to care for and maintain their septic systems.

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**10**  
**YEARS**  
**SepticSmart Week**  
**An EPA Program**

A cartoon illustration of a septic technician named SAM. He is wearing a blue hard hat with 'septicSmart' on it, a green shirt with a 'SAM' name tag, and yellow gloves. He is holding a clipboard with a checklist and a pencil. The illustration is set against a large blue '10' and the text 'YEARS SepticSmart Week An EPA Program'.

# STATE AFFILIATE NEWS

## COLORADO PROFESSIONALS IN ONSITE WASTEWATER (CPOW)

The Colorado Professionals in Onsite Wastewater (CPOW) have been prioritizing member and leadership relationships in recent months and reaping the benefits of doing so. The association hired a new executive director in March, allowing the board to truly focus on members.

CPOW has hosted several member development events including a ski day at Arapahoe Basin Ski Area, a member happy hour, its annual Member Appreciation Day, and is planning its first scramble golf tournament to take place in August. CPOW leadership knows genuine relationships create the foundation needed for a strong association management strategy and is ready to propel forward.

## OHIO ONSITE WASTEWATER ASSOCIATION (OOWA)

Greetings from the Buckeye State! Phones are ringing off the hook for contractors and we have seen the industry grow beyond expectations!

The Ohio Onsite Wastewater Association (OOWA) Board of Directors recently decided to hold their annual conference on January 10-11, 2023 at the Cherry Valley Hotel in Newark, Ohio. With the new location, we are hopeful to have a large industry tradeshow and the first ever Roe-D-Hoe in Ohio! We hope to see you there!

## OKLAHOMA ON-SITE WASTEWATER ASSOCIATION (OOWA-OK)

The Oklahoma On-site Wastewater

Association, a non-profit association representing licensed installers, pumpers, and profilers of the wastewater industry, is excited to announce we have become a state affiliate of NOWRA. We are incredibly thrilled about this partnership that will allow our organization the opportunity to expand our efforts in making changes to the wastewater industry and the businesses that exist within it.

In addition to this new affiliation, OOWA-OK has created monthly meetings with DEQ Management regarding enforcement and regulations, new and old to the wastewater industry, in our mission to uplift the professionalism, profits, and ethics in our businesses.

Later this year, OOWA-OK will host our annual conference October 17-18 in Muskogee, OK. This new and improved two-day conference serves as an opportunity for advanced training for wastewater professionals and businesses. For more information on our NOWRA affiliation, advanced training, and our annual conference, visit [oowa-ok.org](http://oowa-ok.org) in the coming weeks.

## TEXAS ONSITE WASTEWATER ASSOCIATION (TOWA)

Howdy from Texas, where everything is bigger, especially our OSSF issues! We have experienced a steady growth in the OSSF installation business of ATU's in Texas for several decades, but Texas is in a precarious situation with a labor shortage in the on-site industry today. Almost every business that performs maintenance on ATU's is having a difficult time being able to fill maintenance technician positions. I don't think this is just

happening in Texas, but we have a very large number of advanced systems in our state. This is very challenging times for maintenance companies here. Hopefully things will get better sooner than later because the maintenance and repairs keep coming every day, with or without more employees. On a brighter note, we are closer to the rules update and patiently waiting on TCEQ's review of our petitions we submitted way back in December of 2020.

## YANKEE ONSITE WASTEWATER ASSOCIATION (YOWA)

Spring in New England is a busy time, especially for YOWA. Underscoring its continuing commitment to focus on education and training, YOWA recently held a successful webinar which drew 185 attendees. This webinar was held in conjunction with Massachusetts Alternative Septic System Test Center (MASSTC) and focused on Massachusetts Title 5 Sanitary Code Setbacks and "Layer Cake" Systems. YOWA also just held its first in-person training since the pandemic on June 10. This training, "Title 5 Inspections - Basic to Advanced Topics," allowed attendee to earn valuable credits for recertification. YOWA is looking forward to offering more quality training opportunities in the Fall.

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NOWRA conducts bimonthly calls with our state affiliate organizations. For more on NOWRA's affiliate state organizations, visit our web site at: [www.nowra.org/about/state-organizations/](http://www.nowra.org/about/state-organizations/)



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## LEGISLATIVE UPDATE

**by Tracy Hammond, Polsinelli**

On April 5 and 6, NOWRA met with nearly 80 congressional offices as part of our annual legislative outreach event. Similar to last year, these meetings were held virtually due to COVID and security restrictions at the U.S. Capitol. Over the course of the two days, more than two dozen NOWRA members participated in meetings with House and Senate offices to advocate for our federal policy priorities and raise our industry's profile. This participation is especially important in order to build and strengthen relationships with our congressional allies and elevate NOWRA's role in the minds of Washington decision makers. We appreciate all of those members who took time away from their day jobs to represent our customers and the industry.

Our top legislative priority this year is to secure \$50 million in funding for the newly-created EPA Decentralized Wastewater Systems Grant program created by the passage of the bipartisan Infrastructure Investment and Jobs Act (IIJA). While the program is now enshrined in federal statute, it is up to Congress each year to appropriate funds for this and thousands of other discretionary federal programs. This \$50 million figure represents the maximum authorized amount of funding called for in last year's legislation.

NOWRA is also urging Congress to increase funding for USDA's

Decentralized Water Systems program to the fully authorized level of \$20 million. This would be a four-fold increase since the program has received only \$5 million in funding each of the past two years.

NOWRA is not the only voice supporting this increase, however. We have coordinated with over 30 other organizations representing groundwater, environmental and health interests to send a letter to congressional appropriators calling on them to better fund this vital program.

In addition to collaborating with allied stakeholders and meeting with congressional offices to highlight the importance this funding has to our customers around the country, NOWRA members and our team in Washington worked with over 30 House and Senate offices to submit formal funding requests through the 2023 Fiscal Year Appropriations process to provide further support for these programs.

NOWRA's long-term advocacy efforts have already built up some initial congressional support as well. Rep. Terri Sewell (D-AL) led two separate "Dear Colleague" letters to congressional appropriators echoing our call to fully fund these programs that will provide much-needed financial assistance to working-class households across the country. More than 20 members of Congress signed on in support to each letter. NOWRA is also working with our allies in the Senate on similar efforts in that chamber. While

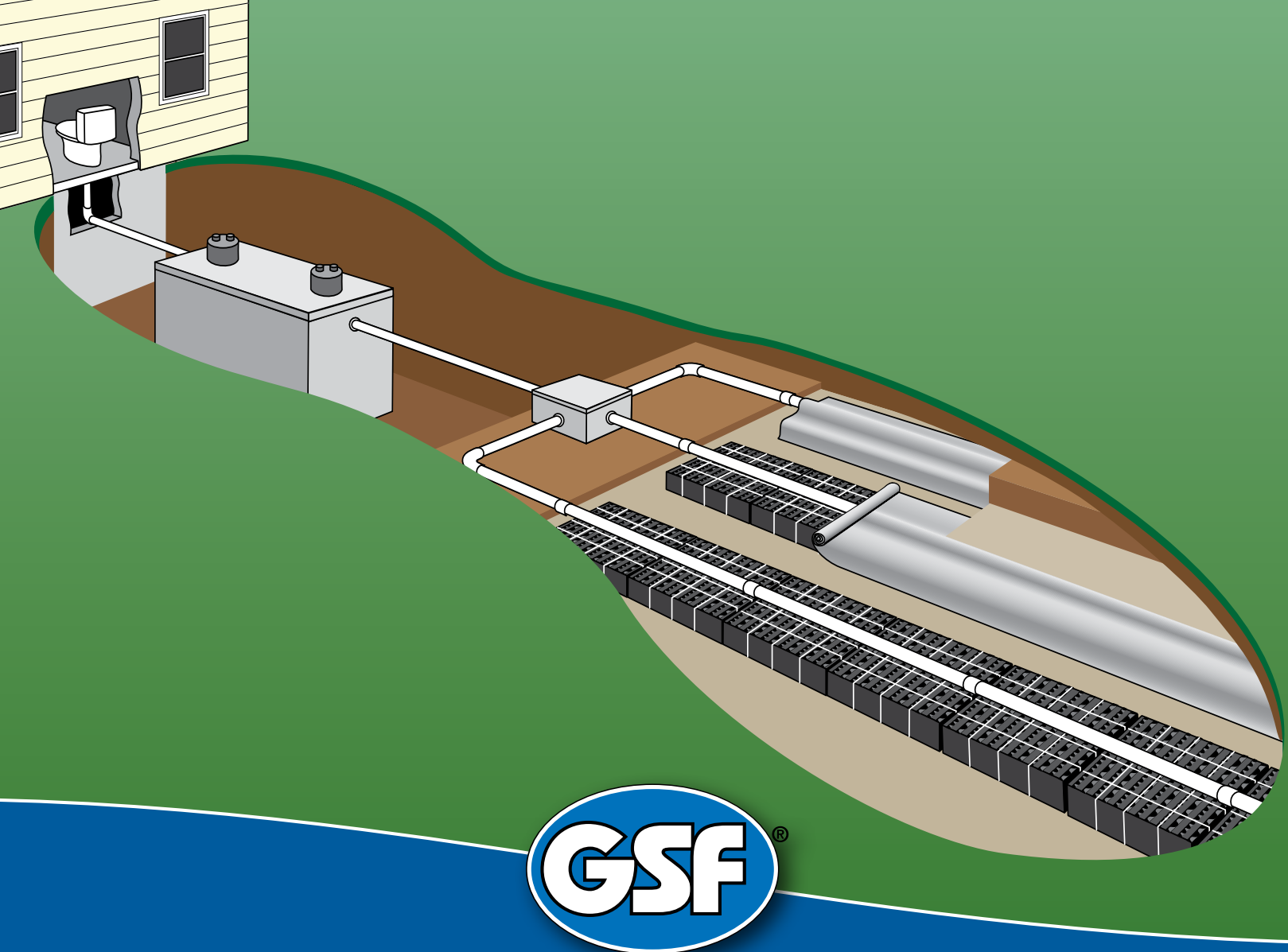
the ultimate results of our work won't be known until much later in the year when the FY 2023 appropriations bills are passed, we will likely see initial versions of these measures later this summer, which will guide our continued advocacy.

The EPA is only beginning the process of drafting the rules and regulations to implement the new Decentralized Wastewater Grant program, and they cannot formally undertake the process until they receive congressionally appropriated funding (see above). NOWRA leadership has met with EPA's decentralized wastewater staff to discuss how the program can most effectively leverage the funding Congress ultimately appropriates. NOWRA will remain in communication with our partners at the Agency throughout the process to ensure the program best aids our customers and homeowners who rely on decentralized wastewater systems, as well as our members who serve and supply them.

---

Tracy Hammond is a Senior Policy Advisor with Polsinelli's Public Policy Group in the firm's Washington Office. He advises clients on federal legislation and regulation in the areas of infrastructure, water and environmental policy and serves as one of NOWRA's lobbyists in Washington, DC.





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Photo 1: Aerial view of Noquochoke Village. Wastewater system location indicated by red arrow.

## CASE STUDY

### Noquochoke Village Affordable Housing project with stringent effluent requirements for Total Nitrogen

**By Kevin Sherman**

The Boston-based developer of the Noquochoke Village affordable housing project had an uphill battle proposing affordable housing in Westport, Massachusetts. The new development would provide affordable, residential apartments in town – something that was in very limited supply in Westport. The project was met with challenges, cost limitations, special permits and push back from some of the town's residents.

"As the design engineer of record for Noquochoke Village, we took the task of designing a wastewater treatment system that met State requirements, local Westport Board of Health, and enhanced nitrogen sensitivity considerations

imparted by the local estuary commission seeking a limit of 5 mg/L," said Phil Cordeiro of Allen & Major Associates, Inc. "In evaluating system design alternatives and service vendors we were pleased to coordinate with J&R Sales and Service, who brought a wealth of knowledge to the design team on how a BioMicrobics® system can meet the demands, be adjusted based on varying field conditions, and be reliably maintained," said Cordeiro.

The site called for the construction of 50 affordable apartments for individuals and families across a wide range of income levels and ability. The seven buildings on site were clustered on the front portion of the site on eight acres of land

once known as the Perry Farm, with about 23 acres along the river known as the Quinn property left undeveloped for trails and passive recreation.

#### Meeting Total Nitrogen Limits

The project originally had state total nitrogen (TN) limits of 25 mg/L. However, the planning board and the town ultimately set effluent limits of less than 5 mg/L TN at the outlet of the treatment system, and a Net Zero TN at the property line. The BioBarrier® High Strength Membrane Bioreactor (HSMBR®) system manufactured by BioMicrobics Inc. was selected as a viable treatment option to meet those requirements. J&R and Wastewater Treatment Services, Inc. (WTS, Inc.) began



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Photo 2: Treatment units safely installed underground in roadways but with easy maintenance access

working with Allen & Major Associates, Inc. to design a decentralized, community-based, aerated Membrane BioReactor System in the summer of 2018.

The system, installed and started up in May of 2019, consisted of:

- A flow attenuation tank (20,000 gallon)
- BioMicrobics® SaniTEE® effluent screens (outlet of 10,000-gallon tank following flow attenuation)
- Two BioBarrier® HSMBR® 6.0-N (~6,000 gpd each) with a two-compartment anoxic zone
- An alkalinity feed system (installed but currently not used) and the MicroC® carbon source
- Geoflow® drip tubing system for dispersal

During the construction process, J&R was ever present to provide hands-on guidance to the site contractors to ensure all workmanship met the design specifications. J&R techs provided physical assistance for the installation

of plumbing, controllers, and other system elements.

Once the system was constructed, J&R handled all aspects of system

startup. This included chemical seeding and laboratory monitoring.

The Geoflow drip tubing system was used for a Soil Treatment Area to reduce TN further by vegetative nitrogen uptake to meet the Net Zero at the property line. The BioBarrier has exceeded expectations by consistently producing a TN of less than 5 mg/L without a daily operator or extensive modification to the operations (Table 1).

“We live in Westport, so it’s been nice to be able to point to a facility in town that is performing so well and providing such low TN limits given its proximity to conservation lands” said Lauren Usilton, president of J&R Sales & Service. “We have been able to use this site for a reference and have installed another system in Westport at the newly built Middle-High School.”

Cordeiro added that the coordination between A&M, J&R and BioMicrobics beneficially served the community and system. “The

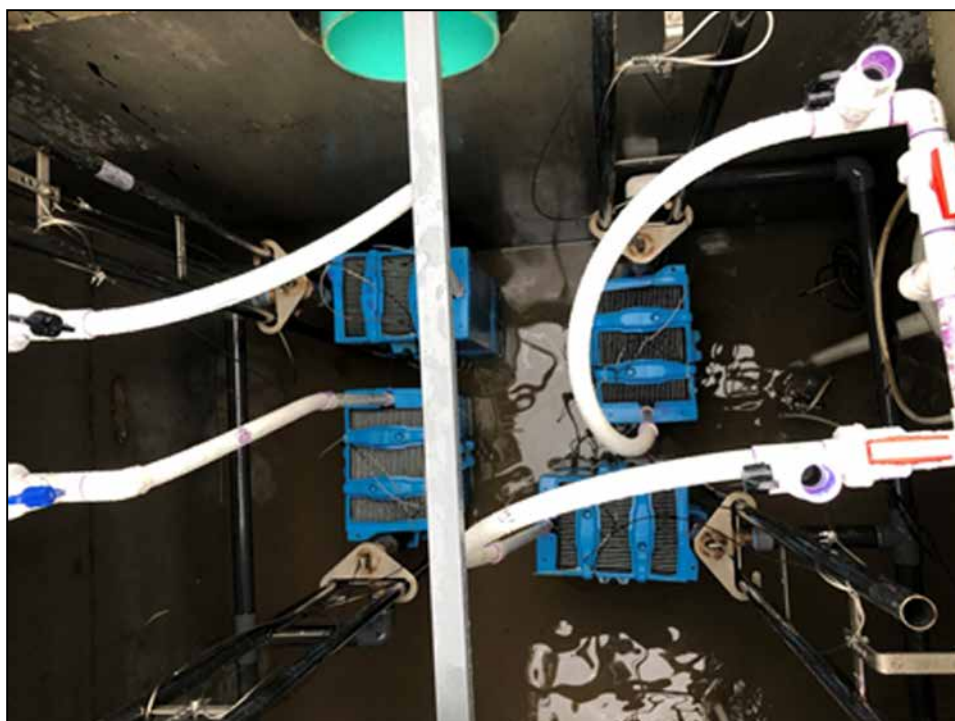


Photo 3: A top-down view of the Membrane Bioreactors after installation.

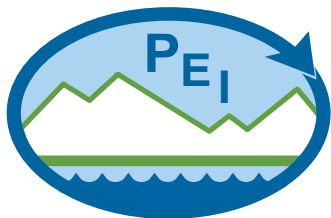


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Table 1: Effluent data with non-detect data substituted as half the detection limit.

Date	daily flow (gpd)	BOD <sub>5</sub> (mg/L)	TSS (mg/L)	TN (mg/L)	Alk. (mg/L CaCO <sub>3</sub> )	pH (unitless)
1/4/2022	4313	COVID	COVID	COVID	COVID	COVID
11/23/2021	nt	2	2	3.71	103	7.1
10/26/2021	4827	2	2	2.78	95.6	7
9/29/2021	5430	2	2	4.38	64.9	7.6
8/26/2021	4538	4	2	2.5	66.4	7.4
7/19/2021	5588	2	2	4.25	56.9	7.4
6/28/2021	6315	2	2	2.9	73.6	7.2
5/25/2021	4591	2	2	0.92	85.9	7.5
4/30/2021	4570	2	2	5.28	43.5	7.5
3/16/2021	4901	2	2	9.33	97.1	7.5
2/12/2021	5133	2	2	7.15	69	7.5
1/22/2021	4970	2	2	2.41	78	7.5
5/28/2020	5515	2	2	3.9	63.7	7.5
5/1/2020	3878	2	2	8.83	63.5	7.4
4/1/2020	4975	2	2	3.64	80.6	7.7
2/28/2020	7932	2	2	3.59	81.4	7.4
1/27/2020	6202	COVID	COVID	COVID	COVID	COVID
12/18/2019	6491	4.4	2	5.43	81	7.7
11/22/2019	5068	2	2	1.68	260	7.8
10/29/2019	3255	2	2	1.9	108	7.9
8/30/2019	2530	2	2	3.91	229	8.1
7/29/2019	1822	2	2	6.8	94.2	7.8
6/28/2019	1289	2	2	10.65	56.6	7.6
min value	1289	2	2	0.92	43.5	7.0
max value	7932	4.4	2	10.65	260	8.1
average	4,733.3	2.2	2.0	4.6	92.9	7.5
median	4935.5	2	2	3.9	80.6	7.5
std. dev	1521.3	0.7	0.0	2.6	53.2	0.3
n (pseudo)	22	21	21	21	21	21
NOTES:	Nd = Non-detect < data converted to 0.5 detection limit (<4 replaced by 2)					
COVID = effluent samples were not taken this month						
Bold = TKN samples not taken this date, used ammonia as a substitute						

J&R team provided a number of design considerations and worked with A&M to fit the site constraints,” Cordeiro said. “The J&R and BioMicrobics® team provided literature that was used during the local permitting process to ensure all local requirements are being met inclusive of a comprehensive operation and maintenance package and servicing.”

With a residential project that gains occupants in phases, the wastewater chemistry required assessments to confirm that effluent parameters

remained below regulatory thresholds. With the site fully occupied, J&R remains under contract as the wastewater system operator. They have provided educational literature and guidance to the Noquochoke Village facility manager for use with residents. The ongoing testing results have exceeded all expectations in meeting the stringent effluent strength thresholds set by the permit.

“Weighed against the other potential treatment vendors and operators, the BioMicrobics system

was approximately 70 percent of the competitive costs. This savings was a direct benefit to the non-profit nature of the Community Builders as the developer of the land in conjunction with the Westport Housing Trust,” concluded Cordeiro.

### Performance monitoring and results

The effluent was grab sampled by Analytical Balance Corporation of Middleboro, MA from the 3,500-gallon permeate tank prior to drip irrigation from June 2019 to January 2022. The pandemic had a substantial impact on the frequency of effluent sampling as two sampling events out of twenty-three total site visits were eliminated due to COVID concerns. Effluent results and a statistical summary are given in Table 1.

The influent had an average flow of 4,733 gpd with the first five months having less flow as residents were being added to the community. The average BOD<sub>5</sub> influent concentration was ~325 mg/L. The average TSS influent concentration was higher at ~537 mg/L. The average TN influent concentration was ~106 mg/L. These influent concentrations combined are within the concentration ranges of a high-strength wastewater.

### Conclusion

The HSMBR® system has shown robust performance for the last 3 years. Operation and maintenance have been limited to pumping out excess solids and cleaning the membranes using in-place procedures every six months. This spring, a thorough cleaning of the membranes is planned.

This experience to date gives hope that achieving stringent total nitrogen effluent limits is possible for membrane-based decen-



tralized wastewater technologies when design enhancements and reliable operation and maintenance services are included with the system.

### About the Author

Kevin Sherman is director of engineering and regulatory affairs for SeptiTech®, Inc. of Lewiston, ME. In addition to 15 years working in the manufacturing sector, Dr. Sherman has been a state-level regulator, a designer, researcher, instructor and association executive during his career. He served as the third president of NOWRA from 1997 to 1999. Kevin has bachelor's degrees in Biology and Civil Engineering, master's degrees in Biology and Public Health, and a Ph.D. in Biological Oceanography. He currently serves as a member of the Technical Practice committee for NOWRA. Contact him by email at [ksherman@septitech.com](mailto:ksherman@septitech.com).



Photo 4: The system uses multiple treatment operation controllers that are easy to access and manage.



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# JAMES CRUVER

## A Pioneer in the Onsite Wastewater Industry

**By Randall Miles**

Earlier this spring the onsite wastewater community lost a dedicated professional and pioneer in the UV disinfection arena, Dr. Jim Cruver. Jim, along with his wife, Sally, were the proprietors of Salcor, one of the leading UV disinfection companies in the small flows wastewater industry. Jim received his PhD in Chemical Engineering from the University of Washington, developing predictive models of coolant loss in nuclear reaction mishaps. He further developed RO Technology for seawater desalination for San Diego County, California.

In the 1990s Jim focused on UV disinfection systems for water and wastewater. In 1997 he adapted the Salcor 3G UV disinfection systems to treat up to 100,000 gpd. He also adapted UV disinfection technology for safe processing of juices after a series of fatal outbreaks in the 1990s. Jim continually worked with NSF to develop minimum contamination standard within the wastewater community. He authored 75 technical papers in the areas of RO, filtration, and disinfection of water and wastewater. He also co-authored a graduate level text book on water treatment.

Jim was dedicated to raising the bar in the onsite wastewater industry. He served on various committees in NOWRA and associated professional societies to assume that reasonable standards were achieved to protect public health



Jim and Sally Cruver attending one of the educational field trips, as they often liked to do, at the 2019 Onsite Wastewater Mega-Conference in Colorado.

and maintain safe drinking water standards. Both Jim and Sally actively participated in NOWRA corporate sponsorship, conference field trips, and social functions.

This participation reflected Jim's philosophy of observing technology in the field and interacting with customers, colleagues and competitors. He thoroughly enjoyed interaction with installers and service professionals in the industry relative to technology performance and practicality. His strong commitment to installers was reflected in Salcor's steadfast sponsorship of NOWRA'S Backhoe Roe-D-Hoe. Jim was continually commenting about the professional quality of the finalists in the competitions. He was also a staunch supporter of "telling our story" to legislators and national regulators through Salcor's involvement with NOWRA's legislative fly in to Washington, D.C.

For those who closely knew Jim, there are many fond and unique memories. First, whenever you saw or talked with Jim you usually saw or talked with Sally too. They truly were a team! At professional meetings when Jim had a meeting or presentation while Sally manned

the Salcor booth he would likely be late returning to the booth or meeting back with Sally. Much of this scenario was due to Jim talking to the many friends that he had on his walk back to the booth. Sally would then ask many of us, "Where is Jim? He's supposed to be back here." Additionally, Jim and Sally were known for their promotion of the California avocado industry by consistently handing out avocados at the Salcor booth.

My memories of Jim Cruver center around his strong professionalism for quality industry standards. He emphasized personalization in dealing with all of his clients. I was very fortunate to interact with Jim over the years with personal calls inquiring, "How are you? How is your wife Pat?" My last interaction with Jim was the evening after the Roe-D-Hoe finals at this year's WWETT Show. Jim shared over the course of a couple of hours with Pat and me his professional and personal history, the many camping trips he and Sally had when they first married. If I could simply summarize the stories: He loved Sally, he loved life, he loved his country, he loved his profession, he loved and

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enjoyed his friends, and he loved NOWRA! Indeed many of us have been blessed to have known and to interacted with Jim!

### About the Author

Dr. Randy Miles is an Emeritus Faculty of the Soil Science program at the University of Missouri. He was Director of the Missouri Soil Health Assessment Center and Director of the Missouri SmallFlows Wastewater Education/Research Training Center. He is principal owner of Randall J. Miles, LLC. Randy is a former NOWRA Board member and past editor of the Onsite Journal.



## NEW BOARD MEMBER

**Ed Schloss**

**Category:  
Supplier/  
Manufacturer**

We welcome Ed Schloss to the NOWRA Board of Directors. Schloss was appointed to the Board in March by President Sara Heger to complete the remaining term of Jim King who moved up to the role of Secretary/Treasurer. Ed has served as the NOWRA Corporate Member Committee chair for the past two years, a role that he has agreed to continue. Welcome aboard Ed!

Ed Schloss has worked for Jet, Inc., a long standing NOWRA supporter, for 13 plus years as a Territory Representative and now as Sales Manager. During that time, he has been involved in developing new distributors and supporting Jet's existing distributors by working with them, their installers and designers. Schloss is also responsible for developing relationships with regulators to gain product approvals and educating them on Jet's products and confirming that distributors and their customers are representing and installing their products professionally to the end users.

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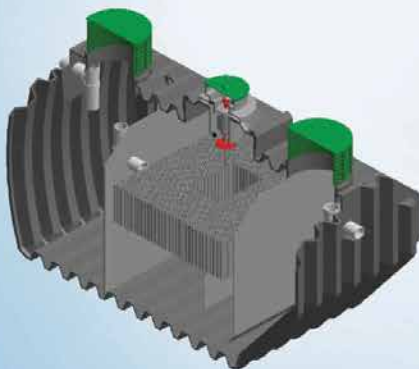
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