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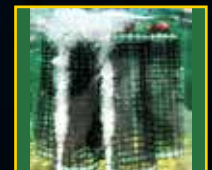


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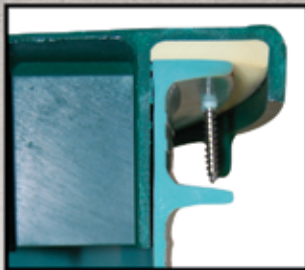
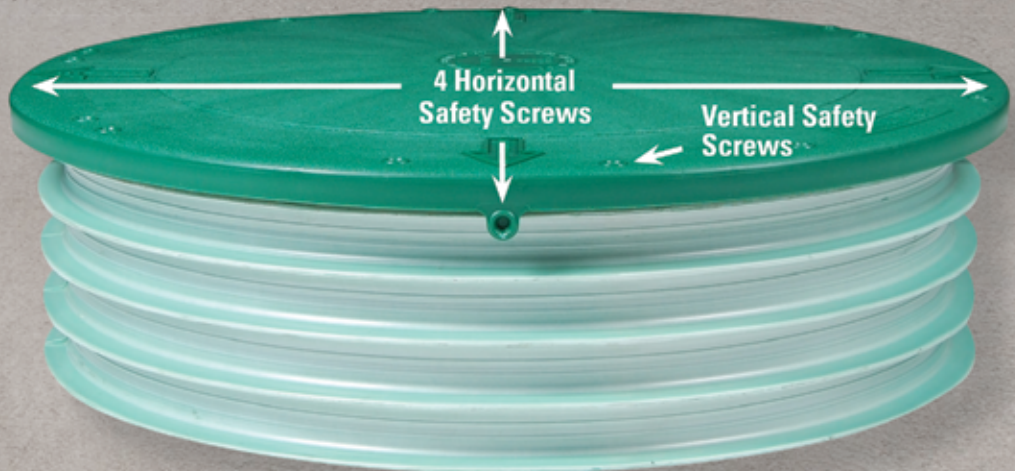


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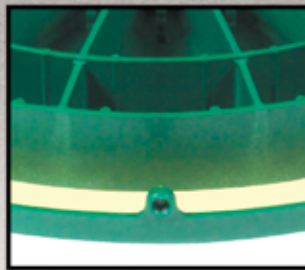
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INSTALLER PROFILE: Professional Promotion

By Peter Kenter

ON THE COVER:

Josh Williams is a firm believer that powerful marketing efforts, professionalism on the job site, and quality workmanship make a recipe for success in the septic installation industry. (Photography by Preston Mack)

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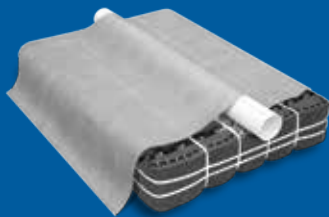
Snapshot: Commonsense solutions

Contractor Profile: Acreage Development Solutions provides one-stop shop

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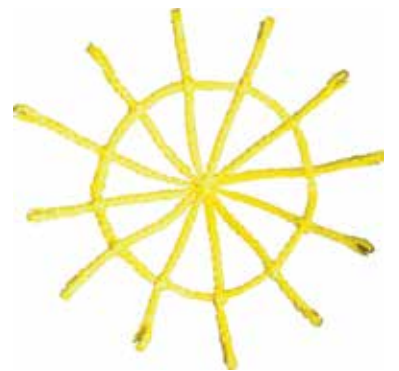


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A Strong Front Line

There's a lot to running a business, and putting your trust in a good office manager is a smart way to keep things operating smoothly

“You're only as strong in the field as you are in the front office.” This quote was passed on to us in this month's Snapshot by Raymond Bellemore, and one that his father told him when he began his business.

I believe there is a tremendous amount of truth behind that advice. In every issue we highlight and feature multiple installers and the incredible work they do in the field, and rightly so. But often overshadowed by the installation work taking center stage are the individuals in the office making sure everything behind the scenes of business workings are in order.

The value of an office manager is tremendous when utilized correctly, but it starts by enabling them to succeed. Define their role and duties and set your expectations from the very first day. After that, and once they have proven themselves capable, your confidence is everything.

Trust

When hiring someone to take a management role, put your faith in them and let them do their job. Micromanaging gives the impression you don't trust their judgment and will affect their leadership and confidence.

One of the biggest assets a good office manager can provide is leadership in a location where you can't be. Micromanagement leads employees to depend on you and your approval and if a manager feels they need your constant guidance to perform their job, they will struggle to succeed when you are away from work or in the field.

It's important to remember that the manager was initially hired because they brought something to the table that could benefit the business. Putting your confidence and trust in them is the best way to allow them to bring those talents forward and utilize their skills.

The value they provide

If you are looking to hire, look for someone who can handle the following roles and once you find the person who has the right skill set and you can rely on, there are a number of areas where business will improve.

Streamlined operations

A well-organized office manager should ensure that the daily operations run smoothly. This involves handling schedules, managing inventory, processing invoices and maintaining records. By keeping these administrative tasks in order, the office manager allows installers and technicians to focus on fieldwork. With an organized front line in the

office and in the field, there is less likelihood of errors and the potential for more jobs due to greater efficiency.

Organized communication

If you've read the June Editor's Notebook, you know how important I think this topic is. Effective communication is vital in the industry, both in house and with clients.

A good office manager acts as a central hub for all communications, ensuring that information flows seamlessly between the office, fieldworkers, suppliers and clients. This role includes everything from answering phone calls and emails to scheduling meetings and disseminating project updates.

Stronger client relations

To expand further on communication advantages, the office manager often serves as the first point of contact for clients. Their ability to handle inquiries, provide accurate information and address concerns professionally can significantly impact the company's reputation. A friendly and competent office manager fosters positive client relations, which can lead to repeat business and referrals which are of course critical components for growth and sustainability.

Financial oversight

Financial management is another area where an office manager's expertise can be invaluable. They oversee budgeting, payroll, and financial reporting, ensuring that the company's finances are in order. This oversight helps in making informed business decisions, maintaining cash flow and ensuring that projects stay within budget. A good office manager can also negotiate with suppliers and manage contracts, further helping the financial health of the company.

Regulatory compliance

As we all know, regulations change in this industry. An effective office manager stays in touch with industry standards, safety regulations and legal obligations, ensuring that the company remains compliant. This vigilance not only helps avoid costly fines and legal issues but also promotes a safe and ethical working environment. Alongside that, it also helps companies stay in touch with the latest equipment and technology that is made to comply with tightening regulations.

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Boosting employee morale

A good office manager also plays a pivotal role in maintaining a positive work environment. By efficiently handling administrative burdens and fostering clear communication, they help reduce workplace stress. Additionally, their involvement in scheduling and payroll ensures that employees are paid accurately and on time, which is crucial for maintaining morale and job satisfaction.

Shout out

It's always satisfying when interviewing for profiles or reading stories to come across owners who shout out the people who don't show up in the working installation photos, but are back holding down the fort.

The more profile features I read, the more similarities I notice between companies that have been successful for a long time, and without question one of those repeated factors is strong front-line personnel handling the business and administrative aspects of the business.

As the people who are often first to interact with customers and usually the ones leaned on during hectic times or stressful situations, your role is invaluable. ❑

DROP US A LINE

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PROFESSIONAL PROMOTION

The owner of Lakeland Septic Company believes that successful, long-term branding goes hand-in-hand with hard work and dedication

By Peter Kenter



◀ Putting the Kubota mini-excavator to work making room for some new Infiltrator tanks. A good system starts with good groundwork. (Photography by Preston Mack)

Josh Williams, owner of Lakeland Septic Company in Lakeland, Florida, worked for his father's septic business for a dozen years before he was bitten by the entrepreneurial bug. With a dedication to building his brand, Williams has grown the company from a one-man shop to one of the busiest septic firms in Central Florida in five short years.

His father, Kenneth, worked in the septic field as long as he remembers. At eight years old, Williams accompanied him on septic runs.

"I was infatuated with the idea of going to work with my dad and pumping tanks," he says. "It's something I've always been drawn to."

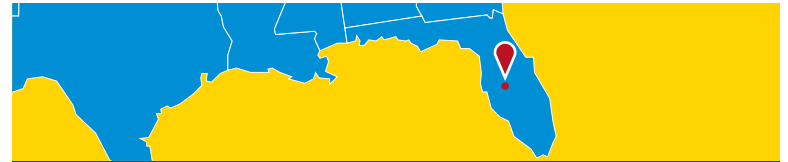
In 2006 he'd earned enough credits to leave high school early, just as his father launched Atomic Septic Tank in Lakeland. He accepted a job with the company, joined by his younger brother Casey, pumping and installing septic systems.

While he enjoyed the work, Williams wanted to do more to boost the company's profile.

"I've always enjoyed marketing and I suggested things that I thought could help the family business," he says. "My father is the best installer I've ever met, but he's stubborn and old school and he would tell me, 'We're just a septic business.' He felt that if the big companies weren't doing something, it doesn't work. I started to feel like I was going to be on that pump truck forever."

BRANCHING OUT

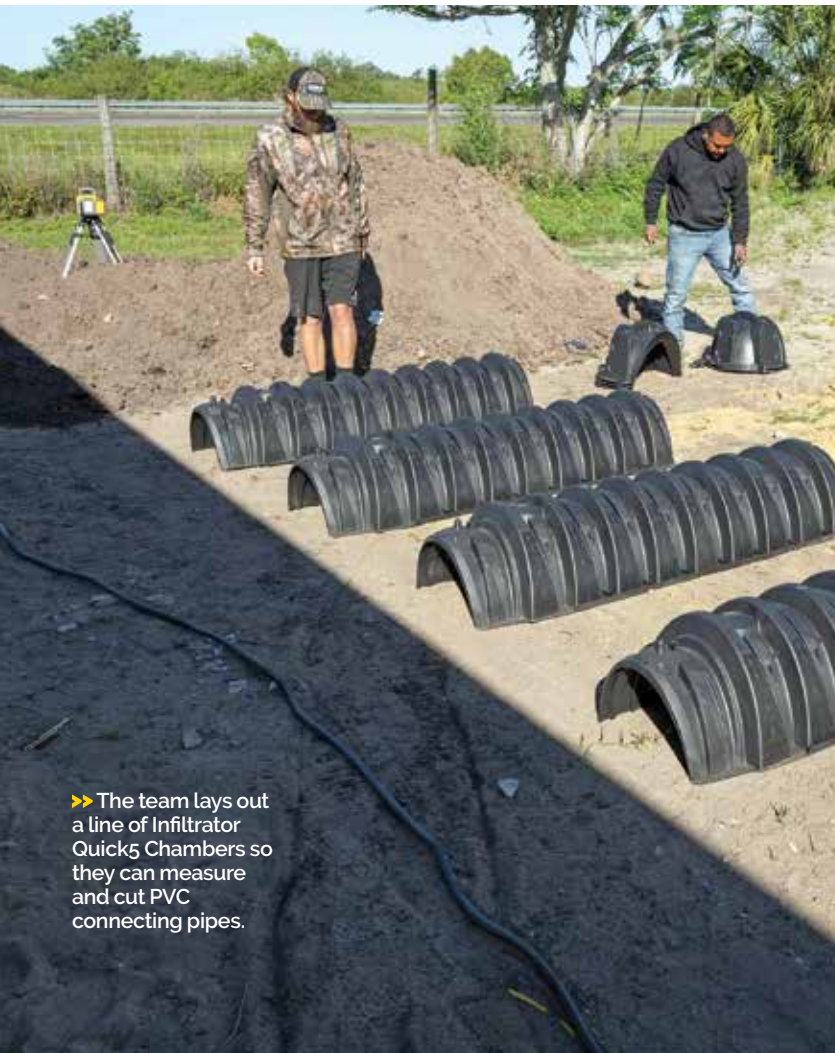
In early 2019, Williams' mother suggested he launch his own septic business and the idea took root. He applied for and received his septic contractor license from the Florida Bureau of Environmental Health in



Lakeland Septic Company

Lakeland, Florida

- Owner:** Josh Williams
- Founded:** 2019
- Employees:** 4
- Service area:** Polk and Hillsborough counties, Florida
- Services:** Septic system design, installation, repair, pumping, inspections; lift station installation and repair; grease trap pumping
- Affiliations:** Florida Onsite Wastewater Professionals, National Onsite Wastewater Recycling Association, Polk County Builders Association
- Website:** lakelandsepticcompany.com



» The team lays out a line of Infiltrator Quick5 Chambers so they can measure and cut PVC connecting pipes.

» Roy Betancourt attaches the intake pipe to the Infiltrator septic tank after the tank was set in place and partially backfilled.



WILLIAMS VS. WILLIAMS?

Josh Williams, owner of Lakeland Septic Company, in Lakeland, Florida launched his own business in 2019, hot on the heels of working for his father's septic company for more than a decade in the same town.

Inevitably, people ask him how it feels to be competing against his father.

"Technically, we compete because we never know when a potential client is calling both of us for a quote," Williams says. "But I tell them my dad's growing a business in Lakeland, and I have my own."

Williams notes that although the companies are both in the septic field, they're very different operations. While his father likes to run a lean business with low overhead, Lakeland Septic is more focused on growth.

"Being leaner, my dad's company can be more choosy about which jobs he takes on, and that makes me jealous at times," he says. "But we get along and we're closer than we were when we worked together. We talk every single day."

Occasionally, the two companies team up on big projects.

"We go back to the way it used to be, where he's on the excavator, and I'm on the ground running things," he says. "At work, we speak the same language — we understand each other."

July. That license allows contractors to pump septic tanks, to install, repair and inspect septic systems, and to design septic systems under 1,200 square feet. He launched Lakeland Septic Company that November.

"The area is saturated with small septic contracting companies," he says. "My mindset going in was that if I wanted to be successful, I had to be different and do the things that nobody else is doing. I wrote down marketing ideas, and I crossed off anything the others were already doing."

Williams devised a logo featuring a Lakeland swan, famous as the descendants of a pair of swans presented to the city in the 1950s by Queen Elizabeth. The company colors include a standout purple.

"When you see the Nike swoosh, you automatically think about athletic shoes," he says. "When I rent a billboard, I don't expect that somebody driving down the road will pull over and call me. But when their toilets starts to bubble, the first image in their head should be our swan with the purple logo."

Williams also invested his energy into learning how to leverage Facebook and Google ads [see online sidebar] and built a social media presence. He created dozens of YouTube videos and flooded social media platforms with blog posts and photographs.

"I word my posts like I'm talking to someone who has no idea what they're looking at when they see a septic tank," he says. "That's my audience. All of these efforts worked very quickly for me, and our business took off like a rocket."

"I was infatuated with the idea of going to work with my dad and pumping tanks . . . "It's something I've always been drawn to."

Josh Williams

EQUIPMENT AND PERSONNEL

Lakeland Septic hired its first full-time worker in 2021 and currently employs four. One drives the pump truck, two work on installs and the fourth is a floater. Williams performs numerous functions.

"I might be in the office doing scheduling, estimates or permits," he says. "I may be on an excavator putting in a system and helping the guys. It depends on where I'm most needed."

The company's main pumper truck is a 2023 Mack MD7 with a 2,500-gallon carbon steel tank and Jurop pump built by Iron Vac Trucks. An older 2002 Freightliner with 3,600-gallon carbon steel tank and Masport pump was assembled by Williams and his father and stands by as a backup.

Construction is supported by a 2021 Kubota KX033 mini-excavator outfitted with an iDig TOUCH 2D excavator guidance system, and a 2023 Kubota SVL75-3 track loader. They're hauled to the site by a pair of Ford F-250s pulling a 24-ft deckover trailer by Bigfoot Trailers.

continued »

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“When I rent a billboard, I don't expect that somebody driving down the road will pull over and call me. But when their toilets starts to bubble, the first image in their head should be our swan with the purple logo.”

Josh Williams

The company serves Polk and Hillsborough counties, but will travel almost anywhere in the state for large commercial contracts involving drainfields larger than 1,500 square feet.

SYSTEMS AND SOILS

About half the septic systems Williams installs are traditional, and the other half are mound systems.

“The soils have great sand,” he says. “We work in material everyone else has to buy. In Polk County, we have areas where you don't even hit the water table at six feet down. In other parts of the county, we might hit the water table at three inches and that's where we need to elevate the drainfield.”

The company is seeing increased demand for nitrogen-reducing ATUs, following the passage of a Florida law in 2021. The Nitrogen-Reducing Systems for Areas Affected by the Florida Springs and Aquifer Protection Act maps out areas requiring these systems on properties of less than an acre covered by Basin Management Action Plans. The affected area was initially small, but continues to expand.

“BMAPs now include most of our area,” Williams says. “I learned how to install ATUs from my father, and got the appropriate education and certification from the manufacturers to install them early on. Now it's here, and we're rolling.”

▲ Moving a Infiltrator CM-1060 into its final resting place is easy work with the company's Kubota KX033 mini-excavator.

▼ William's behind the controls of his Kubota SVL 75-3 skid-steer. One of his go-to pieces of equipment for backfilling a drainfield after a successful septic system installation.



The company favors poly tanks from Infiltrator Water Technologies, using them on 90% of on new installs.

“We're huge fans of their new Quick5 chambers,” Williams says. “They're sturdy and give us the most square feet per chamber. We also use Infiltrator Delta series ATUs, because of their simplicity and performance.”

Lakeland primarily uses pumps by Liberty Pumps and Polylok risers. Other material is provided by Lakeland Winsupply.

The company also installs lift stations to support liquid transfer in mound systems and works on large lift stations for commercial clients.

“The big guys may be on a sewer system, but they still need that lift station,” Williams says. “We change a lot of large commercial pumps regularly.”

continued >>



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Commercial work represents about 20% of Lakeland’s work and these larger projects are among Williams’ favorites. Many current projects involve migrant worker housing for agricultural clients, including local strawberry farmers.

“With these engineered projects we get to install different equipment and work on a different scale,” he says. “Last year we did a system for a migrant worker housing development that included seven septic tanks and 7,000 square feet of low-pressure system drainfield.”

Lakeland also continues a small, but steady, grease trap pumping service for clients such as McDonald’s.

ALL ABOUT BRANDING

Williams continues to aggressively build the company brand for the long haul.

In addition to Lakeland’s social media presence, Williams has used radio advertising and sponsors any sports team willing to sport the company logo. He recently purchased a swan costume, including an upsized Lakeland septic T-shirt.

“I wear it at community events and pose for photographs with people,” he says. “Any time they share those photos on social media, it’s free logo exposure.”

“I learned how to install ATUs from my father, and got the appropriate education and certification from the manufacturers to install them early on. Now it’s here, and we’re rolling.”

Josh Williams

Williams represents the company in several professional organizations including the Florida Onsite Wastewater Association, where he joined the board in 2022. As a member of the National Onsite Wastewater Recycling Association, he recently joined a task force to help develop training for challenging site situations.

He attended the Water & Wastewater Equipment, Treatment & Transport show for the first time in 2024.

“The size of the trade show was insanity,” he says. “For three days I walked around and every day I found something I hadn’t seen the day before. It was also a chance to meet and exchange ideas with contractors that I’ve talked to on Instagram for years.”

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◀ Measure twice, cut once. Chandler Knox makes sure the spacing is correct and takes a measurement before cutting PVC piping to connect the leaching chambers.

teaching other guys how to do this work. If I leave a legacy in this industry and my community, it would be for people to think of my name any time someone mentions 'septic.' ◻

FUTURE PLANS

The company is still young, so Williams hasn't considered family succession plans. His wife, Jessica, has a rewarding career in the banking sector. His oldest daughter Karleigh is 15 and likes to work in the office. Her sister Kenslie is 13 and her brother Brody is 10. They've all been out to project sites, but any genuine interest shown by the kids will determine their long-term involvement with the company.

Over the next decade, Williams hopes to double or triple the size of the company and expand the pumping side of the business.

"It's crazy how much we've grown," he says. "In the next 10 years, I want the guys who are working for me now to still be working here, achieving their personal goals, managing aspects of the business and

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Dwindling Disposal Options, Forever Chemicals Hot Topics in New Hampshire

Wastewater pro Raymond Bellemore reflects on a great crew, challenging projects and a future with more onsite systems to maintain

Compiled by Betty Dageforde

In Snapshot, we talk to a member of a state, provincial or national trade association in the decentralized wastewater industry. This time we visit a member of the New Hampshire Association of Septic Haulers.

Raymond Bellemore II

owner

Business: Souhegan Septic Tank Service, Amherst, New Hampshire

Services we offer: We perform septic and grease trap pumping, septic repairs, camera inspections, riser installations and filter cleaning and replacement for both residential and commercial customers.

Years in the industry: Souhegan has been in business since 1978 when it was established by Carole and Jack Fedas Sr. It was later passed on to Lynn and Jack Fedas Jr. I have been in business since 2001 providing a multitude of services including catch basin cleaning, storm drain and sewer cleaning and jetting, mainline camera inspection, pipe relining and septic services. We combined forces in 2021.



▲ Raymond Bellemore with a 2021 Western Star 4900 built out by Imperial Industries with a 4,250-gallon aluminum tank and National Vacuum Equipment 4310 blower. (Photos courtesy of Raymond Bellemore)

Association involvement:

I have been a member of the New Hampshire Association of Septic Haulers for 20 years and currently serve on the board of directors.

Benefits of belonging to the association:

It provides a chance to network with other companies in the industry as well as have influence and a voice at the state level as new regulations are studied and opened up for commentary.

Biggest issue facing your association right now:

Disposal is currently a big issue for us. I find that over the years land application is being used less often. At the same time, wastewater treatment plant rates have continued to rise. So there are fewer reasonable disposal options available to pumpers. Another issue is PFOS and PFOA chemicals (used in products to make them resistant to grease, oil, stains and water), which are a big environmental concern, impacting both land application sites and wastewater treatment plants.

Our crew includes:

We have an incredible crew. Phil Pellerin has over 30 years' experience. Will Robbins, Colton Gregg, Derin Thomas provide exemplary service. The office team consists of Pauline Renaud, Lynn Fedas, Nicole Carson and Sue Sylvestre who do an outstanding job.

Typical day on the job:

I begin the day by communicating with the office team about scheduling and special projects. Then I spend time on the road meeting with commercial customers. I also follow up with my team members each day.

The job I'll never forget:

One mission I still laugh about happened at a college in New Hampshire. They were experiencing a sewer backup in one of the dormitories. After running hundreds of feet of hose into the building and hiring a rigging



▲ Souhegan Septic Tank Service's 2023 Mack built out by Imperial Industries with a 4,250-gallon aluminum tank and National Vacuum Equipment 4310 blower.

company to lift a large pump station from its structure, we pumped and determined that a student somehow managed to flush a full-sized football into the system, obstructing the pump and backing up into the building. To this day we still have a hard time understanding how a football could have gotten in there.

Most challenging site I've worked on:

Every site presents some kind of challenge when we're trying to solve issues with septic or wastewater systems. There are security issues with government projects, prisons and nuclear power plants; system design and age issues with hospitals and repurposed industrial and commercial sites; and scheduling issues with schools, hospitals and 24-hour operations.

The craziest question or comment from a customer:

Once, when emptying an older gentleman's tank, he asked if we could retrieve his dentures so he could clean and reuse them. He said he didn't want to spend money on new ones.

If I could change one industry regulation, it would be:

Mandating treatment plant hours to match our customer service hours.

Best piece of small business advice I've heard:

My dad used to tell me, "You're only as strong in the field as you are in the front office." I still live by this today.

Crystal ball time - This is my outlook for the wastewater industry:

With a growing population, we will start to see an increase in housing. This will require more usage of wastewater treatment facilities through septic systems or town sewers. This means more trained staff and equipment will be needed in the industry. □

Would you like to see someone in your state or provincial wastewater trade association profiled in Snapshot?

Send your suggestions to Tim Dobbins at editor@onsiteinstaller.com.

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▲ Mark Becker, left, and Tom Armijo, operating a Kubota KX040-4 excavator, begin the process of setting the sludge cone. The cone was part of a polishing system to augment a living machine, part of which can be seen behind the excavator. (Photos courtesy A Advanced Septic & Construction Services)

Student Environmental Center Updates Allow Wastewater Recycling

A Washington state educational facility and event center with demonstration onsite system can now conserve a precious resource by flushing treated wastewater through its toilets

By David Steinkraus

For 20 years, the IslandWood environmental education center has been depending on a living machine to treat its wastewater and has taught children about it. Now its leaders were ready to move into using recycled water for toilet flushing, and they hired A Advanced Septic & Construction Services of Auburn, Washington, to add technology so treated wastewater will be even cleaner.

It wasn't a complicated job because IslandWood's founders put much thought into setting up the original system, and there was a high level of engineering, says Jeremiah Gunia, head of R&D and quality control for A Advanced.

"What's really cool about this place, in my opinion," Gunia says, "Was once we did the final upgrade, all we had to do is turn a couple of fittings and redirect the flow because 20 years ago, before it was approved, before there were any rules or regulations around it, this establishment paid to have plumbing laid with the belief that one day they would get approval to activate it for their reused water. So we didn't have to replumb any of the buildings for this water to come back in. They had foresight 20 years ago to actually run the lines to the bathrooms for reuse."



◀◀ Jonathan Nelson of A Advanced signals for concrete as technicians set the custom-made stainless steel sludge cone at IslandWood education center.

✔ Sometimes a shovel is the best tool for the job. Because of the tight spaces involved, Jonathan Nelson, left, and Tom Armijo did most of the trenching to set pipes by hand.



System Profile

Location: Bainbridge Island, Washington
Facility served: Environmental education and event center
Designer: Aqua Nova Engineering Plc
Installer: A Advanced Septic & Construction Services, Auburn, Washington
Type of system: Bioreactor addition to living machine
Site conditions: N/A
Hydraulic capacity: 3,500 gpd

Tidal Water

IslandWood is both a classroom and an event center, Gunia explains. The facility hosts high-end weddings and other events, and uses that income to provide free environmental programs to schoolchildren.

The original living machine consists of five basins. Wastewater from the kitchen and main meeting building flows first into a 10,000-gallon pre-existing concrete trash tank. By gravity water floods the first of two outdoor basins filled with gravel and plants. When this basin is full, water is pumped to the second basin. The basins represent the coastal shoreline, Gunia says, and the high and low water levels mimic the rise and fall of tides. When a basin is empty, oxygen is pulled through roots, he says, and when water is in the basin, plants pull out some of the nutrients.

From the second basin, water flows to a greenhouse where three basins filled with more plants provide additional treatment. A drainfield disperses effluent.

To facilitate wastewater reuse, A Advanced added a bioreactor polishing step after the 10,000-gallon tank, so the pump pushes water to the new series of tanks. All were set above ground so water flows by gravity to the first basin.

First in the new installation is a 2,100-gallon poly tank from Norwesco. Inside is a Nibbler (Aqua Test) bioreactor with floating media about the size of a Wiffle ball, Gunia says, and this tank is aerated. After this step, water

flows into a custom-made, stainless steel, cone-shaped tank that settles and thickens sludge. Liquid flows by gravity to the next basin. Clarified water flows through a 24-inch well with a Polylok filter, then into the first gravel basin of the existing system.

A Advanced also upgraded UV equipment inside the greenhouse, Gunia says. Technicians cut out the old unit and installed one from Aquacare Environment Inc. The lamp is inside a 3-inch-diameter tube so water flows around the lamp on all sides.

Panels were already in place to run the living machine, Gunia says, so engineers sent custom wiring to be fitted into the panels for control of the new components.

SYSTEM PROFILE

» To add polishing equipment to the living machine at IslandWood, A Advanced installed two tanks and a well, visible in background, to intercept the wastewater flow from a 10,000-gallon settling tank. Water then resumed its previous route into the first of two outdoor gravel basins, foreground.

» The addition is shown here before pipes were laid. Wastewater enters the poly tank at right, then flows to the stainless steel sludge cone, then to the well at left where it flows through a Polylok filter.



Collaboration

IslandWood is 75 miles from the A Advanced shop. That's a 90-minute one-way drive if there's no traffic, Gunia says. "We rented some hotel rooms. We did some day trips back and forth." And it's all part of the job when you work in an area with islands, he adds. "You may go 5 miles, but when you're waiting for a ferry to load and unload, it adds time."

Work was scheduled around events at IslandWood, but some had to happen during events, Gunia says. Technicians needed visitor passes and the IslandWood staff was courteous to the installers and made sure they were fed.

One of the small challenges was working out fittings and parts, Gunia says. Because the engineers for the system are on the East Coast, they specified parts common in their area. A Advanced technicians had to understand what the engineers were trying to accomplish and then find parts that perform the same function and that could be shipped to the island.

"I don't know how you find anything more in our passion zone than **supporting youth and cultivating a culture where responsible wastewater management is cool.**"

Jeremiah Gunia

Interchanges with the engineering firm were amazing, Gunia says, because they were receptive to suggestions. A Advanced lead technicians, who have been installing for a long time, were honored by being listened to, he adds.

There were some change orders. The 24-inch filter well was added while the job was in process. The stainless steel cone had already been set in its concrete base, so it had to be removed and raised 6 inches to allow gravity flow into the well. Associated pipes had to be raised 6 inches, too.

If the reuse system reaches capacity, there is an overflow to direct treated wastewater to the dispersal field, Gunia says. If IslandWood staff need to, they can also change a couple of valves to send all the treated wastewater to the field.

"What made it challenging is we had to dig between the greenhouse and the large rock basins. We had to dig down 3 1/2 feet, identify several of the many pipes so we could intercept and plumb in and out — which sounds really simple until you dig down 3 1/2 feet and you have 17 different PVC pipes," Gunia says. "When we exposed several feet of the pipes, we found somebody 20 years ago took a Sharpie and wrote on the pipes, and they took a picture of the plumbing. It was still a little bit scary because it's a working, living, operating machine, and you don't know if you're in the right pipe really until you've cut it and done the work."

Because of the narrow spaces, about 75% of the job was dug by hand, he says. The rest was done with a Kubota KX040-4 compact excavator. A Kubota SVL95 skid-steer handled materials.

Although not strictly necessary, the polishing equipment installed by A Advanced will improve the system and make maintenance of the gravel basins significantly easier, Gunia says. "You hit a system in four hours with a big event, and sizing and principles go out the window. It all works, but a lot of times we're sizing these around 24-hour windows, and event centers can hit their daily capacity in three to four hours."



« This is the 20-year-old living machine used at IslandWood education center on Bainbridge Island, Washington. The outdoor gravel basins at center and right accepted and treated wastewater from a settling tank. The greenhouse held more basins with more plants that performed additional treatment.

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Some extension of the project occurred because A Advanced recommended changes to make teaching easier, Gunia says. For example, technicians shifted the location of air blowers for the bioreactor so instructors can be more easily heard during tours. Moving some electrical racking created a better walkway.

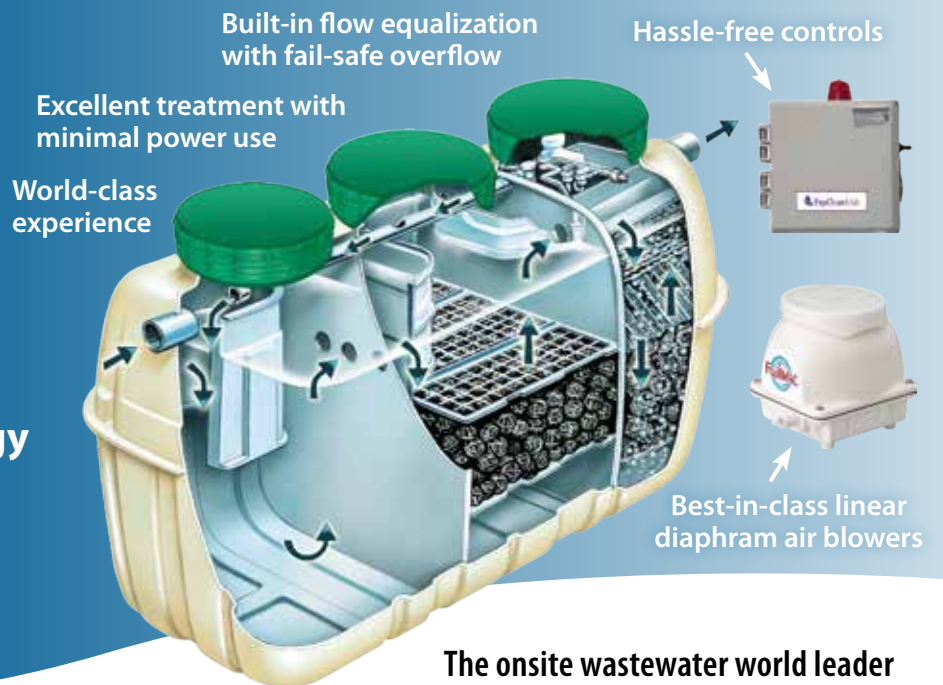
“They should be putting these at elementary and high schools around the country,” Gunia says. “For the cost of treating your wastewater, and

having a reuse opportunity, you can have a botany, a biology, an electrical and basic mechanical class all in one, and have it be a beautification project.

“A Advanced wanted this one to be a win for everybody,” he says. “It certainly was not our most lucrative job, but it’s a 200-plus-acre, high-end educational facility dedicated to children that focuses on wastewater. I don’t know how you find anything more in our passion zone than supporting youth and cultivating a culture where responsible wastewater management is cool.” □

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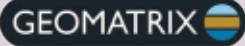

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Anua PO Box 77457 Greensboro, NC 27417 336-547-9338 info@anuainternational.com www.anuainternational.com	Quanics AeroCell Open Cell Foam Biofilter	NSF 400 to 1,500; Commercial per design	2000	AeroCell is a recirculating media biofilter providing stable treatment across a broad range of applications. AeroCell utilizes synthetic open cell foam cubes housed in a preassembled module. The media will not degrade over time and has a three-decade track record of performance. Pretreated effluent is timed dosed over the media using specially designed helical spray nozzles that provide uniform distribution. Treatment is optimized by recirculating effluent through the media multiple times. The mods are factory assembled and can be configured as a combined treatment and effluent dispersal system. Certified to NSF/ANSI Standard 40 with nitrogen reduction.	US and Canada
	Quanics BioCoir Coconut Fiber Biofilter	NSF 400 to 1,500; Commercial per design	2000	BioCoir is a recirculating media biofilter providing stable treatment across a broad range of applications. BioCoir utilizes coir media housed in a preassembled module. Coir are the fibers that comprise the thick husk of the coconut fruit. The coconut fiber is low cost and an upcycled resource. Pretreated effluent is timed dosed over the media using specially designed helical spray nozzles that provide uniform distribution. Treatment is optimized by recirculating effluent through the media multiple times. The mods are factory assembled and can be configured as a combined treatment and effluent dispersal system. Certified to NSF/ANSI Standard 40 with nitrogen reduction.	US and Canada
	PuraSys SBR	NSF 400 to 1,500; Commercial per design	2015	PuraSys SBR ships as boxed kit for installation in any septic tank. Kit includes control panel, floats, pre-drilled siphon pipe, PVC pipe stands, siphon/sludge pump, aerator, and drainfield pump. The system can be used for new construction or be retrofitted into existing tanks to renovate biologically failed drainfields. PuraSys SBR uses a unique batch process, where the treatment steps are done in a timed, sequential manner. The process is energy efficient since treatment occurs as needed, using intermittent aeration, mixing, and settling. Certified to NSF/ANSI 40 Class I and to NSF/ANSI 245 for nitrogen reduction.	US and Canada
 BioMicrobics, Inc. 16002 W 110th St. Lenexa, KS 66219 800-753-3278 913-422-0707 marketing@biomicrobics.com www.biomicrobics.com See ad page 19	HighStrengthFAST	1,000 to 9,000	1996	BioMicrobics' HighStrengthFAST Wastewater Treatment System treats wastewater produced by applications such as restaurants, cafes, malls, and hotels. Part of the proud FAST family of products, HighStrengthFAST is simply great technology: easy to install, easy to operate, always reliable. The proven process of attached growth combined with robust aeration makes the patented FAST system technologically innovative and extraordinarily consistent. HighStrengthFAST can be combined with NitrIFAST for improved nitrogen removal, or MyFAST for applications greater than 10,000 GPD.	Global
	MyFAST	10,000 to 160,000	2005	Engineered to fit applications of 10,000 to 2,000,000 GPD, the MyFAST (and larger MacroFITT) Wastewater Treatment System uses multiple biological and physical processes to treat wastewater. Ideal for residential (multi-family properties, clustered subdivisions, and small municipalities) and high strength commercial applications, FAST (Fixed Activated Sludge Treatment) is simply great technology: easy to install, easy to operate, always reliable. The proven process of attached growth combined with robust aeration makes the patented FAST system technologically innovative and extraordinarily consistent. Decades of field performance show that FAST systems reduce nitrogen levels – including nitrates and other nitrogen compounds – at high percentages.	Global
	SeptiTech STAAR	500 to 27,000	2013	Designed for both domestic and commercial wastewater, the SeptiTech STAAR (Smart Tricking Anaerobic/Aerobic Recirculation) Filter Systems can treat from 100 to 27,000 gpd. The biological trickling filter achieves low levels of nitrate and with lower operating costs and power requirements than competing products. All below-grade system components fit in readily available concrete, plastic, or fiberglass tanks. The system is suitable for areas where large tracts of land are not available for land-intensive wastewater treatment systems. Especially appropriate for environmentally sensitive areas, the STAAR system reduces BOD5 and provides for efficient nitrification and denitrification.	Global
 Eljen Corporation 90 Meadow Rd. Windsor, CT 06095 800-444-1359 info@eljen.com www.eljen.com See ad page 5	GSF	Scaleable	1982	The Eljen Geotextile Sand Filter (GSF) is an advanced wastewater treatment and dispersal technology. The GSF system provides treatment and dispersal in the same footprint while keeping installations simple and maintenance minimal for domestic and commercial applications. The system requires no startup period. GSF Modules are uniquely designed to provide vertical surface area and oxygen transfer to support the biological treatment of nutrients and contaminants, increasing the soil's ability to accept effluent and the soil's long-term acceptance rate. The GSF has been Tested and Certified by NSF to NSF Standards 40 and 245 Class 1.	North America and Australia

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTORS IN
 <p>Fuji Clean USA 41-2 Greenwood Rd. Brunswick, ME 04011 207-406-2927 • Fax: 207-406-2929 info@fujicleanusa.com www.fujicleanusa.com See ad page 23</p>	<p>CE Series</p> <p>CEN Series (denitrification)</p> <p>Commercial Systems</p>	<p>500 to 1,350</p> <p>500 to 1,350</p> <p>1,350 to 6,000</p>	<p>2006 Japan 2015 US</p> <p>2011 Japan 2015 US</p> <p>2006 Japan 2015 US</p>	<p>FujiClean's CE model series averages 50,000 systems installed annually worldwide. The popularity is driven by a one-tank configuration, small footprint (7' x 4' for smallest model), low power draw (less than \$6/month for most residential systems), easy plug & play installation, simple & efficient O&M, and consistent treatment (90-95% BOD and TSS removal). No preceding septic tank necessary. NSF 40 certified. There are no moving in-tank parts. An external air blower (FujiMAC RII) introduces oxygen to aerobic chambers and powers two internal air lift pumps, which manage sludge return and discharge of clean effluent.</p> <p>FujiClean's CEN technology provides enhanced denitrification into its standard treatment process and produces a consistently high-quality effluent (NSF 40/245 certified: 5 BOD, 6 TSS and 10 TN) from straight septic wastewater – no preceding septic tank necessary. No moving in-tank parts. The CEN5 is compact (about 8' x 4'), lightweight (about 475 lbs.), highly maneuverable and features a low power draw (one 80 L/min blower drawing 1.27 kWh/day), plug & play installation, and optional wireless telecommunication package that offers both dial and text capabilities. The CEN model series is producing best-in-class treatment numbers and lowest life cycle cost in multiple U.S. states.</p> <p>Commercial FujiClean systems provide all the benefits of smaller systems – just scaled up in size. FujiClean's largest CE commercial system, the CE6KG, is now available. The CE6KG can treat up to 6,000 gpd; uses the same treatment technology, process flow and one-tank structure as the smaller CE systems. Like other FujiClean models, the compact size can be squeezed into the tightest of commercial sites with a footprint of only 36' x 6.5' (including built-in septic tank). Other models available with both CE an CEN (denitrification) technologies include CE14 (1,350 gpd), CE21 (1,900 gpd), CE30 (2,700 gpd) and CEN14 (1,350 gpd), CEN21 (1,900 gpd), and CEN50 (4,500 gpd).</p>	<p>Worldwide headquarters in Japan, US, Australia & Germany</p>
 <p>Geomatrix Systems, LLC 114 Mill Rock Rd. E Old Saybrook, CT 06475 860-510-0730 info@geomatrixsystems.com www.geomatrixsystems.com</p>	<p>SoilAir</p> <p>GeoMat</p>	<p>1 - 100,000+</p> <p>1 - 100,000+</p>	<p>1998</p> <p>2005</p>	<p>SoilAir is a patented technology that intermittently aerates the leach field and the surrounding soils rather than continuously aerating the wastewater in a tank. The soils in the leach field become a massive enhanced treatment system. Since air has 21,000 times the capacity to hold oxygen than water, this process provides unprecedented rejuvenation of failed septic systems, extends the lifespan of new leach fields and enhances treatment. SoilAir is effective at treating high strength wastewater and has been successful at oxidizing ATU sludge out of systems. SoilAir's systems have been extensively tested.</p> <p>The GeoMat passive treatment and leaching system is ultralow profile, designed for maximum treatment and infiltration. GeoMat is 1" thick and available in widths of 12" and 39". It is comprised of an entangled filament core, a hydroscopic membrane and an internal gravity or LPP pipe. The shallow burial depth and high surface area to void space ratio of GeoMat results in unprecedented aeration. This increased oxygen results in increased removal of pathogens, B.O.D., T.S.S., and nutrients such as nitrogen and phosphorus. When installed on 6" of specified sand, GeoMat treatment levels have been tested to meet NSF/ANSI Standard 40.</p>	<p>US and Canada</p> <p>Many States, Contact Manufacturer</p>
 <p>IMET Corporation 13400 Glenside Rd. Cleveland, OH 44110 440-799-3135 info@imet.net • www.imet.net See ad page 16</p>	<p>Septic Remediation Module (SRM)</p> <p>Septic Treatment Modules (STM)</p> <p>Vault Toilet Module (VTM)</p> <p>Grease Interceptor (GIM)</p> <p>Lift Station Module (LSM)</p>	<p>200 to 5,00</p> <p>500 to 1,500</p> <p>Any Size Tank</p> <p>Any Flow Rate</p> <p>Any Flow Rate</p>	<p>2013</p> <p>2018</p> <p>2022</p> <p>2013</p> <p>2013</p>	<p>IMET SRM is an effective and economically feasible solution for the remediation of failed/failing septic systems and failed/failing leach fields, including sand mounds/fields, while eliminating septic odors. It is an easy to install drop-in system requiring very little maintenance. IMET SRM has two simple components; module(s) and air pump(s) installed in any size and type of septic tank(s). It requires short residence times and minimal energy for aeration to deliver markedly low BOD and TSS at all times. It has been proven through various applications to treat wastewater when hydraulic load exceeds septic system design capacity.</p> <p>IMET STM is Class I certified to ANSI/NSF standards 40 and 245 for the effective and economical treatment of septic wastewater. It is an easy to install system requiring very little maintenance. It requires short residence times and minimal energy for aeration to deliver markedly low BOD and TSS at all times. IMET STM provides an option in its design to reduce Total Nitrogen when required. It is certified for new construction and it is a complete solution for the renovation of failed septic systems and leach fields.</p> <p>Economical IMET VTMs greatly reduce bad septic odors to elimination levels in and around the vault toilet, while minimizing the frequency of costly and odorous pump-outs. VTMs are installed directly into the plastic or cement vaults of waterless toilets where human waste is collected. VTM's unique design enables conversion of human waste to odorless and relatively clear water through natural biological degradation. The first VTM application has not required any pumping since its installation for more than 2 years. The client has named it "the magic bubbler" due to the readily recognized elimination of septic odors.</p> <p>Grease Interceptors/traps are often associated with bad odors, especially during pump-outs at restaurants, resorts, shopping centers, colleges and cafeterias etc. Discharged Fats, Oils and Grease (FOG) result in costly and painful plugging issues in the downstream lines. Installing IMET GIM directly into the grease interceptors/traps of any size and type will eliminate downstream line plugging and also greatly reduce frequent pump-outs while eliminating bad odors. GIMs design disrupts the formation of FOG cakes and large particles by the growth of FOG consuming microorganisms. GIM continuously seeds the downstream lines with FOG consuming microorganisms resulting in the elimination of FOG build-up.</p> <p>Lift stations often experience Fats, Oils and Grease (FOG) build-up, causing heavy maintenance/repair of the pumps, frequent, costly pump-outs and septic odors. Downstream line plugging may cause flooding, especially in locations where large amount of FOG flows into the lift station. Many types of trash flow into the lift station and are bound by FOG causing a floating mass. Installing IMET LSM directly into the lift station biologically degrades FOG thus eliminating the formation of the floating mass. In all applications LSMs successfully eliminate septic odors, downstream line plugging and minimize costly maintenance. LSM are easy to install and maintain.</p>	<p>USA, Canada, Caribbean</p>

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTORS IN
 <p>Infiltrator Water Technologies, LLC 4 Business Park Rd. Old Saybrook, CT 06475 800-221-4436 info@infiltratorwater.com www.infiltratorwater.com See ads on pages 3, 6</p>	Whitewater DF	500 to 1,500	1993	The process occurs entirely within the self-contained treatment unit which is comprised of outer mixing tank and a cone-shaped settling chamber. Raw, unsettled domestic wastewater enters directly into the mixing tank where mixing occurs through an air distribution system. The mixed liquid then enters the settling chamber from the bottom. The settling chamber maintains a quiet condition which allows solids to settle down and re-enter the mixing chamber for more processing. The liquid from the ANSI/NSF 40 certified system is hydraulically displaced upward and is discharged as a clear, odorless treated water which meets or exceeds state water quality standards.	AL, AK, AZ, BC, BWI, CA, CO, FL, GA, HI, ID, IL, IN, IA, KY, LA, ME, MI, MD, MN, MO, MS, MT, NC, NM, NV, NY, OH, OK, ON, OR, TN, TX, UT, VA, WA, WI, WV
	ECOPOD	500 to 250,000	2006	The ECOPOD Advanced Wastewater Treatment System is a FFBR (fixed film bioreactor) system that houses an engineered PVC media specifically designed to treat domestic wastewater. Five models accommodate daily flows ranging from 500 to 1,500-gpd, with customizable options available for commercial applications up to 250,000-gpd. The ECOPOD is ideal for individual residential installations, cluster designs, and small-to-medium commercial wastewater treatment applications. Self-contained, it can be inserted into a standard-sized septic tank or vault providing quiet, odorless operation. ECOPOD is certified to ANSI/NSF International Standards 40 and 245, FHA and VA acceptable, and suitable for intermittent usage.	
	Enviro-Aire Package Plant	500 to 1,500	2005	The Enviro-Aire Package Plant consists of a three-step process to treat incoming wastewater. Raw wastewater enters the unit from a residence or facility. The first chamber is the primary chamber which separates the sludge (gross solids) and scum (floating solids) from the raw wastewater. Effluent then enters the aeration chamber where aerobic bacteria digest the organic waste. From the aeration chamber, the liquid enters the clarifier chamber, where additional water-solids separation occurs. Settled solids return to the aeration chamber for additional aerobic digestion. The air diffuser within the aeration chamber is a patented design to reduce back pressure on the air compressor and maintain constant, non-clogging air flow. The ANSI/NSF 40 certified system design is easy to operate and maintain and is engineered for low energy consumption.	IL, LA, MS, TX
 <p>Jet Inc. 750 Alpha Dr. Cleveland, OH 44143 800-321-6960 • 440-461-2000 Fax: 440-442-9008 email@jetincorp.com www.jetincorp.com See ad page 17</p>	JCP	1,500 to 300,000	1970	Jet's Commercial Wastewater Treatment Extended Air and MBBR Plants are modular in design, can treat flows from 1,500 to 300,000 gallons of wastewater per day and allow for phased build out. This makes it possible for motels, shopping centers, restaurants, and service stations to be constructed along interstate highways far from any town. Factories and Subdivisions can be developed miles beyond sewer lines. Time-tested plants treat wastewater through the performance-proven aerobic digestion process that enables microscopic living organisms to transform wastewater into a clear, odorless liquid. Jet offers assistance with design, engineering, and construction as well as onsite 24/7 tech support, plant start up commissioning and operator training.	
	J-Series	500 to 1,500	1993	J-Series BAT Media Plant is a natural, organic, chemical-free system that uses nature's own resources to reduce wastewater to a clear, odorless liquid in just 24-hours. Employing the patented Biologically Accelerated Treatment process that supplies oxygen to naturally occurring microorganisms found in wastewater. Microorganisms attach themselves to the submerged Jet BAT Process Media, forming a "Biomass" to quickly and effectively treat wastewater. The 700 Series Aerator supplies the oxygen and the mixing that supports our exclusive treatment process, converting wastewater into colorless, odorless liquids and gasses. The J-Series, tested to NSF Standard 40, is available in 500 to 1,500 gpd in concrete and 500 to 800 gpd in a seamless plastic tank. Multiple system control options are available.	Worldwide
	CF-Series	500 to 1,500	2008	Jet's Nutrient Reducing BAT Media Plants offer variable capacity in a NSF-40/245 tested treatment system. The J-1500CF Series provides complete effluent treatment from 500 to 1,500 gpd. The 500 and 800 gpd PLT Series tanks are the lightweight, rotational molded alternative to the concrete J-1500CF Series. The seamless polyethylene tanks are easy to transport and install in the most difficult site conditions. J-1500CF Series utilize the proven 700++ aerator, effluent filter and the Jet 197 Control panel. The 197 Control panel cycles the aerator to reduce the nitrogen by over 60%.	
	R-Series	450 to 1,400	2016	R-Series utilize time proven BAT Media, Jet 700++ aerator and the Illumi-Jet UV Disinfection Unit to meet NSF Standard-350 for applications that require shallow discharge, direct discharge or reuse. The R-Series Plants offer variable flow capacity from 450 to 1,400 gpd in precast concrete and seamless, polyethylene tanks. The polyethylene tanks handle from 450 to 750 gpd that are the lightweight, rotational molded alternative to the concrete version. The seamless polyethylene tanks are easy to transport and install in the most difficult site conditions.	
 <p>Norweco, Inc. 220 Republic St. Norwalk, OH 44857 800-667-9326 • 419-668-4471 Fax: 419-663-5440 email@norweco.com www.norweco.com See ad page 15 Norweco continued >></p>	Singular Model 960 and Model TNT (Total Nitrogen Reduction)	500 to 1,500	1996, 2006	The Singular system is the state-of-the-art alternative to a troublesome septic tank for domestic wastewater treatment. Employing the extended aeration process, the Singular plant provides flow equalization, pretreatment, aeration, clarification, tertiary filtration and optional chemical addition within a single precast concrete tank. Designed for domestic wastewater flows ranging from 500 to 1,500-gpd, performance of the Singular system is certified by NSF International (Standards 40 and 245) and the Canadian Standards Association.	North America, Central America, South America, Europe, Africa and Middle East
	Singular Green Model 960 and Model TNT (Total Nitrogen Treatment)	600	2010	The Singular Green aerobic treatment system incorporates Norweco's advanced aerobic treatment process into a durable, watertight polyethylene tank. It is ideal for new or retrofit applications and can be installed easily in the most difficult jobsite with just a backhoe. Incorporating support ribs and inherently strong arch shape, the durable Singular Green tank will provide decades of reliable performance. Designed for domestic wastewater flows up to 600-gpd, with treatment performance meeting or exceeding the strictest state and county requirements, Singular Green is certified by NSF International (Standards 40 and 245).	

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTORS IN
<p>Norweco, Inc. 220 Republic St. Norwalk, OH 44857 800-667-9326 • 419-668-4471 Fax: 419-663-5440 email@norweco.com www.norweco.com See ad page 15</p>	Hydro-Kinetic	500 to 1,500	2012	The Hydro-Kinetic wastewater treatment system employs innovative Hydro-Kinetic filtration technology to produce the cleanest, most consistent effluent quality available. The Hydro-Kinetic system uses extended aeration and incorporates both suspended and attached growth processes to treat wastewater. The patented Hydro-Kinetic Bio-Film Reactor provides final treatment of the wastewater to a near pristine state. The Hydro-Kinetic system is the only NSF/ANSI Standard 40 and 245 certified residential wastewater treatment system to pass two consecutive tests without performing routine maintenance for a full 12 months. The Hydro-Kinetic system exceeds regulatory standards and is certified and listed to BNQ Standards CAN/BNQ 3680-600 and NQ 3680-910.	North America, Central America, South America, Europe, Africa and Middle East
	Singulair R3 and Singulair R3 Green	500 to 1,500	2018	The Singulair R3 reduces water consumption, reuses treated effluent and recycles water to conserve and recharge our groundwater. It provides the cutting-edge solution to chronic water shortages and reduces energy costs of water and wastewater treatment. The system efficiently treats incoming wastewater to the highest level for restricted indoor and unrestricted outdoor use. With unrivaled performance, the Singulair R3 system exceeds the effluent requirements of NSF/ANSI Standards 40, 245 and 350.	
	Singulair Solar	500 to 1,500	2020	The Singulair Solar system delivers an environmentally friendly solution for onsite wastewater treatment by utilizing renewable solar energy to generate electricity. Solar power is a 100% clean, renewable energy source that offers year round efficiency and reduces your carbon footprint. Singulair Solar technology requires no moving parts, providing quiet, efficient operation with minimal maintenance.	
	Singulair HK and Singulair HK Green	500 to 1,500	2022	The Singulair HK Green wastewater treatment system is specified in areas that require significant and consistent reduction of Total Nitrogen. This hybrid system combines both suspended and attached growth biological processes to produce superior effluent results with no service requirements for 18 months. The system meets or exceeds rigid regulatory standards and is performance certified and listed to NSF/ANSI Standards 40 and 245. Singulair HK Green achieved astounding certified effluent results of 3.0 mg/L CBOD, 4.4 mg/L TSS and 7.2 mg/L TN, an 84% reduction of TN.	
	Singulair Green with Integral Pump Chamber	600	2022	The Singulair Green tank with an optional 520 gallon integrated pump chamber provides a single tank solution for situations that require a downstream pump tank. The Singulair Green with pump chamber arrives at the site ready to install. The cutting edge features of this system make installation and maintenance of expanded treatment systems quick and easy. The all-in-one system provides superior structural integrity.	
 <p>Orenco Systems, Inc. 814 Airway Ave. Sutherlin, OH 97479 800-348-9843 • 541-459-4449 www.orenco.com</p>	AdvanTex AX-RT	Up to 750	2000	The AX-RT is a "plug and play" wastewater treatment system that can be shallowly buried and installed right behind a septic tank, as easily as a septic tank. Its compact design fits on small lots and reduces costs for excavation and installation. That means property owners (residential and small commercial) can buy AdvanTex quality at a competitive price. The AX-RT is designed to be easily maintained with an annual service call, thanks to its accessible, cleanable filters and media. And its high-quality, high-head pumps have been known to last over 20 years (as seen in the Elkton, Oregon, sewer system).	North and Central America, Australasia, Europe, and Africa
	AdvanTex AX-100	2,500 to 12,000	2002	Orenco's patented AdvanTex Treatment Systems include the compact AX-100, which offers a small footprint, making it a viable option for small sites. It works as efficiently as a sand filter, enabling treatment of high-volume commercial and multi-family flows in tight spaces. The AX-100 is a premanufactured package, including the textile media, and has low maintenance requirements, low power use, and low life-cycle costs. It provides consistent, reliable treatment, even under peak flows, producing clear effluent that's ideal for reuse.	
	AdvanTex AX-Max	1,750 to 100,000	2010	The AX-Max is a completely integrated, fully plumbed, and compact wastewater treatment system for commercial properties and communities. It's ideal for projects with strict discharge limits, limited budgets, and part-time operators. Like all AdvanTex Treatment Systems, the AX-Max is a recirculating media filter that produces outstanding effluent that's suitable for reuse, with significant nutrient removal. AX-Max systems are highly energy-efficient and require minimal operation and maintenance.	
 <p>SludgeHammer Group Ltd. 4772 US 131, Bldg. D Petoskey, MI 49770 231-348-5866 www.sludgehammer.net See ad page 9</p>	SludgeHammer S-46/86	400 to 600	2003	The SludgeHammer S-46/86 models are designed to provide enhanced treatment when retrofitted into existing septic tanks while supplying a stream of facultative aerobic bacteria from the proprietary SludgeHammer Blend that digest the clogging mucus in failing leach fields through the process of fermentation. The units are certified and listed under IAPMO Standard IGC180-2003 and listed with the UPC.	Most States and Canada
	S-400/600/800/1000	400 to 1,000	2008	The SludgeHammer S-400 through S-1000 are certified and listed as Class 1 Advanced Treatment units under the NSF-40 standard. The bioreactor is installed in appropriately sized conventional septic tanks from local sources providing an economic method to obtain advanced treatment. The SludgeHammer ATUs are unique in digesting most of the solid waste as well as liquid waste. Maintenance is the easiest in the marketplace.	

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Advanced Treatment Units

By Craig Mandli

ADVANCED TREATMENT UNITS

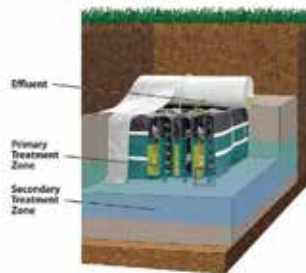
BioMicrobics HighStrengthFAST

The HighStrengthFAST wastewater treatment system from BioMicrobics is a robust and simple aerobic treatment system utilizing submerged, fixed-film activated sludge technology. It treats domestic and high strength wastewater for onsite, decentralized applications, and is ideally suited for small community and commercial usage with extreme environments such as specialty food/beverage/agriculture applications. It contains attached growth media optimized for biological wastewater treatment that handles heavy-duty solids loading, especially for high BOD concentrations and higher FOG levels. An above-grade blower — the only moving part in the treatment process — pushes air into the airlift, recirculating oxygenated water throughout the submerged media. These attached-growth microorganisms break down the organic material in the wastewater. The excess solids settle out of the media to the bottom of the tank, where they are stored for intermittent removal. 800-753-3278; www.biomicrobics.com



Eljen Geotextile Sand Filter

The Eljen GSF, or Geotextile Sand Filter system, is designed to provide treatment and dispersal in the same footprint with easy installation and minimal maintenance. It is used for commercial and residential applications. Utilizing a two-stage pretreatment process, the geotextile modules apply filtered septic tank effluent to the soil, increasing the soil's ability to accept effluent and increase the long-term acceptance rate. Its design provides increased surface area for biological treatment that greatly exceeds the module's absorption area. Open-air channels within the module support aerobic bacterial growth on the module's geotextile fabric interface, surpassing the surface area required for traditional absorption systems. The system is tested and certified by NSF to NSF/ANSI Standard 40. 800-444-1359; www.eljen.com



Infiltrator Water Technologies AeroFin

AeroFin from Infiltrator Water Technologies is an engineered passive onsite wastewater combined treatment and dispersal system that creates a biological ecosystem digesting the organic matter in wastewater on a continuous basis. It is ideal for installation on compact sites with footprint constraints. As a combined treatment and dispersal system, it treats and disperses effluent in the same footprint utilizing media and specified sand. The system is proven to remove up to 99% of wastewater contaminants without using any electricity, replacement media, or additional maintenance and has been tested in accordance with NSF/ANSI 40 standards. Each unit is 8 feet long and has an outside dimension of 12.75 inches. Conduits and manifolds are manufactured using recycled polyethylene and feature snap-lock couplings and PVC piping allowing for easy system assembly. The compact design enables delivery to the installation site in a standard pickup truck. 800-221-4436; www.infiltratorwater.com

MicroSepTec EnviroServer ES

The MicroSepTec EnviroServer ES (Extended Storage) is designed for residential and commercial applications. It utilizes pre-engineered, prefabricated MBBR technology. In residential settings, it combines various processes to remove contaminants to ensure safe disposal or reuse of water. The system is designed to be compact, easy to install and low-maintenance, making it suitable for homes and small communities. It also offers efficient wastewater treatment solutions for businesses, commercial buildings and larger establishments, with its extended storage capacity allowing processing of higher volumes of wastewater. 877-473-7842; www.microseptic.com



Norweco Singulair Green

Norweco's Singulair Green with integrated pump chamber offers a single tank solution for small lots and restrictive soil conditions. The unit with a 520-gallon integrated pump chamber arrives at the site ready to install. This lightweight, easy to install tank provides superior structural integrity. Systems and packages are always in stock and ready to

ship. Nitrogen treatment packages are available on all Singulair treatment systems. Their 12- and 6-inch threaded riser extensions allow for at-grade installation. 800-667-8326; www.norweco.com

Orenco Systems AdvanTex AX-RT Series

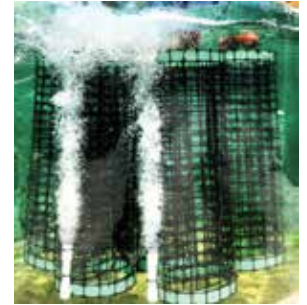
The AdvanTex AX-RT Series of advanced wastewater treatment systems from Orenco Systems is designed for system repair and rehabilitation, along with nitrogen reduction. All interior components are installed, plumbed, and adjusted at the factory. Units can be shallowly buried for use between a functional, watertight septic tank and a functioning drainfield. The three-in-one design includes recirculation, treatment, and discharge in a single unit to simplify installation and eliminate the need for additional tanks, basins, risers and lids. The treatment system can be maintained with an annual service call, and filters and textile media are accessible and cleanable. No blower is needed for the passively vented system. An optional UV disinfection unit is available. 800-348-9843; www.orenco.com



AEROBIC TREATMENT

RioVation BioMaze

RioVation BioMaze is a fixed film media treatment technology that combats drainfield issues. The 26-inch tall, 8-inch diameter media and aeration pods install via a riser into the septic tank. These floating, self-positioning pods have retrieval lines for ease of maintenance. The energy-efficient HiBlow XP80 air-pump with housing and integrated alarm powering the unit ensures a cost-effective operation. The resulting effluent typically boasts low single digit BOD and TSS, along with reduced fecal coliform and nitrogen levels. It goes beyond typical aerobic treatment to act as a “suspend biofilm generator,” fostering suspended biofilm microorganisms throughout the tank and into the drainfield. The SBG facilitates rapid “forced rejuvenation,” visibly improving drainfield performance within days, in systems plagued with biomat sludge. 352-436-9412; www.riovation.com



Water Tight Structures

Septic Tanks - Sand Filters - Grease Interceptors
Bio-Fast Tanks - Nibbler Tanks



Shades of Sherwood Campground in Zumbota, MN

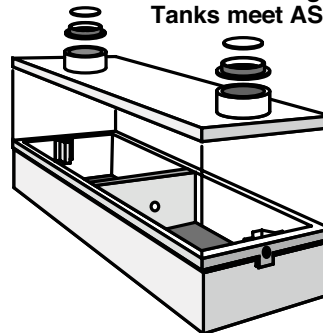
2- 38,000 gallon septic tanks, 20,000 gallon pump tank,
 5 each 20,000 gallon recirculation tanks
 and 3 each 7,700 gallon pump tanks were installed

2 Compartment

Commercial Sizes - Gallons

2,000 - 3,000 - 5,000 - 6,000 - 8,000
 10,000 - 12,000 - 15,000 - 18,000
 20,000 - 25,000 - 30,000 - 38,000 - 40,000

Water Tight Construction
 Tanks meet ASTM C1227 and C913



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NITROGEN REDUCTION SYSTEMS

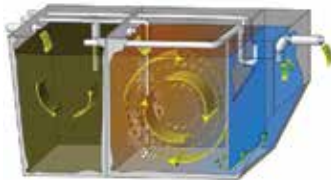
Anua AeroCell

The AeroCell recirculating media filter from Anua utilizes synthetic media housed in an engineered pod. The open-cell foam cubes have high surface area and porosity, which balance water movement and oxygen availability. The media will not degrade over time. Pretreated effluent is sprayed over the media using special helical spray nozzles, which provide uniform distribution over the entire surface area within the pod. The treated effluent is recirculated through the media multiple times, ensuring optimum treatment. The media properties and timed dosing allow for large loading rates, ensuring a small footprint. It provides significant nitrogen reduction and is certified to NSF/ANSI 40 Class 1. Multiple pod sizes are available for commercial facilities. 336-547-9338; www.anuainternational.com



AquaKlear AK6S245

The AquaKlear AK6S245 nitrogen-reduction advanced treatment unit has been approved in accordance with NSF/ANSI International Standard 245. This all-in-one treatment design has a capacity of 600 gpd with three chambers, including a pretreatment chamber, aeration zone and clarifier with no internal moving parts. Systems are also available in 750, 1,000 and 1,200 gpd units in both fiberglass and concrete construction. The process produces high-quality treated water with a 60% reduction in total nitrogen. These units help reduce the amount of nitrogen-rich sewage entering the soil and affecting ground water and water quality standards, thus meeting state regulations. 877-936-7711; www.aquaklear.net



Eliminite Commercial C-Series

The Commercial C-Series system from Eliminite is designed to provide reliable treatment with emphasis on total nitrogen reduction for high-strength waste applications such as worker camps, RV parks, restaurants, ski and golf resorts, breweries, mines and agricultural operations. It may be used with locally sourced tanks and components. MetaRocks treatment media is designed to withstand a variety of high-strength waste-loading scenarios, particularly where clogging and odor control are major considerations. The system is scalable and may be adapted to suit specific phasing requirements, site constraints and unique demands. 888-406-2289; www.eliminite.com



Jet Inc. J-1500CF Series

The J-1500CF Series nitrogen-reducing BAT media plant from Jet Inc. offers variable capacity in a NSF 245-tested treatment system. It provides complete effluent treatment from 500 to 1,500 gpd. The 500 and 800 gpd PLT Series tanks are the lightweight, rotational molded alternative to the concrete J-1500CF Series. The seamless polyethylene tanks are easy to transport and install in difficult site conditions. The system uses a 700++ aerator, effluent filter and the Jet 197 control panel, which cycles the aerator to reduce the nitrogen by more than 60%. 800-321-6960; www.jetincorp.com



RECIRCULATING FILTERS

E-Z Treat Re-Circulating Synthetic Media Filter

E-Z Treat manufactures NSF 350 water treatment reuse applications throughout the United States. The biological-based treatment system Re-Circulating Synthetic Media Filter produces high-quality effluent to accommodate a wide variety of flows for residential and commercial sites, whether subsurface or surface discharge. 703-753-4770; www.eztreat.net



UV DISINFECTION

Polylok PL-UV1 UV Disinfection Unit

The PL-UV1 UV Disinfection Unit from Polylok reduces bacteria levels from secondary effluent to meet strict water quality standards. Components of the compact unit are engineered and constructed to provide reliable disinfection and long operational life, according to the manufacturer. It has a dual-pass design, a long-life UV bulb, weatherproof electrical components and no chemical residual or harmful byproducts. It is easy to install and operate and uses little electricity. Rates for gravity flow only are 100 through 8,640 gpd, with 100 through 4,320 gpd with 30 mg/L BOD and 30 mg/L SS, and 4,321 to 8,640 gpd with 10 mg/L BOD and 10 mg/L SS. It offers a UV dose greater than 40,000 microwatt-seconds per square cm at 254 nanometers, with transmissivity of 65%. 888-765-9565; www.polylok.com



PRODUCT NEWS

PRODUCT SPOTLIGHT

Mini-excavator provides power, serviceability and comfort

By Craig Mandli

Your mini-excavator is a vital tool for onsite system installation. It is important that they be dependable, comfortable and easy to operate. The ViO80-7 from Yanmar Compact Equipment North America features significant improvements to hydraulic efficiency, cab comfort and ease of maintenance. They are ideal for work in not only onsite system installation, but in utility, construction, demolition and landscaping applications.



“These machines are entirely redesigned with the operator and service departments in mind,” says Buck Storlie, Yanmar Compact Equipment North America product manager. “From more comfort and enhanced ergonomics to an open hood system that is incredibly efficient to work on, we’re confident operators will be thrilled with the ViO80-7’s performance and overall experience.”

Operators will see the biggest differences from the previous models in the newly designed cabins. Each is built for comfort and operator experience. The upgraded space in each includes a suspension seat, more foot space, ergonomic foot pedals and a wider cabin for easier entry and exit. Operators can survey the worksite more easily with increased cab glass area. Hot days are more tolerable with the included automatic air conditioning, the cab is quieter and additional USB ports allow for convenient phone charging.

The 18,122-pound ViO80-7 features 18% more power over its predecessor with a 67 hp Yanmar Tier 4 Final diesel engine. It provides operators with increased attachment performance with 20% more PTO flow rate. It also achieves a maximum dig depth of 14 feet, 3 inches.

The ViO80-7 features Yanmar’s signature zero tail-swing design that allows the excavator to rotate next to a structure with less risk of hitting it. A 2-Pump Load Sensing hydraulic system improves efficiency, increasing pump flow rate under high loads to direct power where it’s needed and improve performance. Additionally, the system saves about 13% on fuel consumption as only the necessary amount of flow rate is utilized.

Operators can see relevant machine information and options at a glance on the new 7-inch color LCD. Options include PTO flow rate adjustment, Auto-Decel mode, and a new passcode lockout feature. Additionally, operators can easily see blind spots with the standard rearview and right-side cameras shown split screen on the display. An optional Surround View feature reduces blind spots further by showing a 360-degree view on the operator’s display. This can reduce the risk of accidents and help avoid damage when working in close contact with obstacles or walls. 770-877-9894; www.yanmarce.com

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Advanced Treatment Units

By Craig Mandli

MBBR system efficiently processes high-strength wastewater from meat packing plants



Problem: The Miami Nation faced significant delays in animal processing due to a lack of in-house meat processing capabilities. Plans to construct a meat-processing facility were developed with funding assistance from the CARES Act in 2022. With no access to a municipal sewer system at the site, the nation required a wastewater treatment system that could manage high-strength waste efficiently while being simple to operate and capable of being maintained by facility personnel.

Solution: The Earthtek Environmental AMBR moving-bed biofilm reactor was selected due to its simplicity, its minimal operation and maintenance requirements, and the cost-effectiveness of the treatment process for treating high-strength wastewater. The system is an aerobic process utilizing long-lasting fiberglass tanks. The system contains thousands of polyethylene media pieces, which provide a large surface area for bacteria to attach and grow. The bacteria consume organic material and automatically slough excess biofilm to adjust to variable flows and loading. The system includes a primary tank to settle solids and provide anaerobic digestion of waste sludge; two FRP aerobic MBBR tanks; one clarifier tank with sludge pump, two blowers (active and standby); chlorine tablet disinfection; a pump tank; and a spray irrigation field for disposal of the treated effluent.

Result: The system has enabled the Miami Nation to achieve needed meat processing capabilities by providing efficient wastewater treatment and operational efficiency in a challenging environment. 800-972-9940; www.earthtek.com

Advanced treatment unit a fit for tight coastal lot



Problem: Watch Hill, Rhode Island, is a beautiful coastal village in the town of Westerly surrounded on three-sides by water. Many consider the area as the ideal summer resort vacation location due to the proximity of major cities New York, Boston and Providence. However, most lots are compact in size, especially those adjacent to coastal areas. One four-bedroom home with shingle siding was located on one of those very small lots. The only open space was for a septic system that had a total usable area of only 18 by 20 feet.

Solution: Cherenzia Associates designed a FujiClean USA CEN5 compact advanced treatment unit with enhanced nitrogen reduction. The system was installed by Wright Excavating.

Result: The system brought treatment limits well below acceptable thresholds. Crystal clear effluent is then fed to a 24-inch-diameter pump basin dosing a Geomatrix GST 12-foot long drainfield. 207-406-2927; www.fujicleanusa.com

Aerobic module helps revitalize septic system and leachfield



Problem: A homeowner had a failing septic tank and leachfield in the winter at their historic century-old home in northeast Ohio. The failing three-tank septic system and leachfield, due to plugged soil, caused standing septage water and noxious septic odors. The county suggested a sand mound or new leachfield. These two options would either put a very large sand mound in front of their home or force the homeowner to cut down a mature tree lot on the property. The homeowner refused to agree to either of the proposed options.

Solution: The county health department invited IMET to install its aerobic biological module (which did not have state approval at the time) to demonstrate complete remediation of the existing failing septic system and plugged leachfield. The “drop in” module was installed directly into the second tank of the septic system in just under 3 hours. The system only requires immersing the module in the septic wastewater and connecting its diffuser to a small, quiet, energy-efficient air pump.

Result: Within six months the failing system was converted into a well-functioning septic system, and the leachfield was dry and green. The homeowner has never needed to pump the septic tank and has never experienced any odor, while having a lush green and dry lawn to enjoy. Grab samples from the distribution box showed BOD less than 10 mg/L and TSS less than 5 mg/L. 216-906-1066; www.imet.net

Bacterial generator solves wintery effluent discharge issues



Problem: French Road Cellars is a 20,000 cases per year custom-crush winery that makes a wide variety of wines and ciders on Michigan’s Leelanau Peninsula. The winery’s process water went to an old septic tank followed by two bottomless tanks that were used to disperse their effluent. Because the effluent could reach BODs in excess of 10,000 mg/L, they had clogged and were overflowing. They had no room for a formal leachfield and operators didn’t know what to do.

Solution: SludgeHammer came in and installed their Aerobic Bacterial Generator equipment to improve the wastewater quality. The technology recovered the percolation pits and the system was no longer overflowing. But the Michigan Department of Environmental Quality did not like putting that much water into the soil in such a concentrated manner. SludgeHammer worked with DEQ to create a scaled-up system that could improve the quality further so an alternative disposal could be found.

Result: The new treatment system was able to take advantage of the bottomless tanks by cementing them in so they could add capacity. New tanks were added, and installers used a horizontal drill to take the effluent up under the parking lot and onto a hill in back of the property. They then plowed in a subsurface drip field and the hillside has been accepting all wastewater for the last 5 years with no problems. 231-348-5866; www.sludgehammer.net ▣

Vermont Lakes Group Wants Regulations Allowing Innovative Onsite Treatment

By Joan Koehne

In a letter published in *The Barre Montpelier Times Argus*, the Federation of Vermont Lakes and Ponds is asking the Vermont House of Representatives to act on a water quality bill and an outdated septic system capacity statute. According to Pat Suozzi, author of the letter and president of the lakes protection group, Vermont's antiquated limitations on septic system design capacity don't reflect today's new, innovative, alternative systems.

Here's some background: In 2023, the Vermont Senate passed Senate Bill 146 related to the permitting of indirect discharges. However the House Committee on Environment and Energy has not acted on it. The bill clarifies how indirect discharges of wastewater are permitted, including compliance with the state's water quality standards.

Several lakes that exceed the Vermont Water Quality Standards are eligible for reclassification from B2 to A1 watersheds, according to the Department of Environmental Conservation. Reclassification would allow earlier intervention if phosphorus levels rise and would prioritize the lakes for restoration funding. However, reclassification is on hold because of state limits to septic system capacity.

The current statute reads, in part: "No person shall cause a discharge of wastes into Class A waters, except for on-site disposal of sewage from systems with a capacity of 1,000 gpd or less that are either exempt from or comply with the environmental protection rules, or existing systems, which shall require a permit."

Suozzi urged the House Committee to take up the water quality bill, review septic system capacity standards and broaden discharge rules.

Kansas

Two rural communities in Riley County, Kansas, were awarded a combined \$3 million to improve their wastewater systems. The Kansas Department of Health and Environment Bureau of Water announced the State Water Plan grant awards in the spring.

One grant of \$460,000 will be used for construction of a nondischarging wastewater treatment lagoon facility at University Park. The facility will replace a mechanical wastewater treatment facility. The \$1.96 million project is primarily funded by a \$1.5 million Small Town Water and Sewer Infrastructure Assistance Grant.

The second project, at Keats, Kansas, will replace aging onsite treatment systems with a new wastewater lagoon facility and collection system. The Kansas Department of Health and Environment's Bureau of Water is investing \$2.5 million in the project.

Ohio

The Ohio Environmental Protection Agency awarded \$4,600 to the Ashland Soil and Water Conservation District to hold an educational

outreach event in Loudonville, Ohio. The event will help to educate residents in Knox, Ashland and Holmes counties about water quality. Participants will receive information about septic system installation and maintenance, drinking water and wells. The state's large river study determined that failing septic systems played a significant role in the water quality of the Mohican River watershed.

Rhode Island

Residents in Cranston, Rhode Island, can apply for interest-free loans to repair or replace failing septic systems and cesspools, reported *Providence Now ABC 6*. Rhode Island Housing and the Rhode Island Infrastructure Bank developed Cranston's Community Septic System Loan Program and will administer the loans. Residents can apply for loans of \$1,000 to \$30,000, with loan terms of up to 10 years. Septic systems in the program must include risers to grade and an effluent filter.

In a statement, Cranston Mayor Ken Hopkins said, "This initiative not only ensures compliance with regulations but also promotes the well-being of the entire community. By ensuring that septic systems are properly maintained, residents can help protect the environment and prevent potential health hazards."

Loan applications and more information are available at cranstonri.gov/csslp/.

Colorado

Denver Water's Administration Building is the first in the state of Colorado to operate an onsite water recycling and reuse system, the *Denver Post* reported. The system is called RUFUS, short for ReUse For US. RUFUS collects and cleans water from the administration building's sinks, toilets and urinals, and the cafeteria. The water is then reused in the six-story building's urinals and toilets.

RUFUS is part of Denver Water's water management initiative that began in 2012 when the water utility started to redevelop its 35-acre Operations Complex near downtown Denver.

Before RUFUS became a reality, several laws and regulations needed to be set. For example, state legislation in 2018 made it legal to use recycled water to flush toilets. After this law passed, the Colorado Department of Public Health and Environment created regulations related to the use of recycled water in toilets. □

"Rules and Regs" is a monthly feature in *Onsite Installer*™. We welcome information about state or local regulations of potential broad interest to onsite contractors. Send ideas to editor@onsiteinstaller.com.

Remembering the Original Septic System Answer Man, Roger Machmeier

By Jim Kneiszel

Roger E. Machmeier, Ph.D., known to a generation of *Pumper* readers as the Septic System Answer Man, passed away July 6 at his home in Lindstrom, Minnesota. He was 96.

For 15 years, starting in 1991, Machmeier shared his expertise about design, construction and maintenance of septic systems with *Pumper* readers through a popular monthly column. As a longtime professor for the University of Minnesota and an Agricultural Extension engineer, Machmeier was influential in the development of standards for decentralized wastewater treatment. He chaired a 90-member committee appointed by the Minnesota Pollution Control Agency to write state code for septic systems.

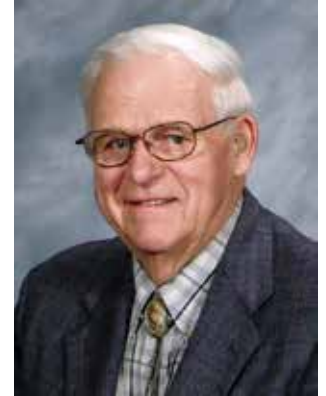
Machmeier is credited with developing the design of the Minnesota mound sewage treatment system for individual septic tanks. He led a program to update onsite systems on lakeshore properties in Minnesota and he educated thousands of pumpers and installers throughout his career. He authored more than 30 technical papers in the onsite area during his career.

Jim Anderson, Ph.D., who took over the Answer Man column in *Pumper* when Machmeier retired, remembered his colleague and mentor at the University of Minnesota as a “giant” of the onsite industry.

“Roger was the best engineer I have ever known,” Anderson said. “His knowledge and skill and approach to problem solving was without equal.” Anderson said Machmeier was an excellent teacher who listened and responded thoughtfully to questions asked by pumpers and installers.

“The thing that set him apart was his ability to use those engineering skills and apply them to problems or issues in the onsite industry to come up with very practical and implementable solutions,” Anderson said. “He was such a good communicator with the pumpers, installers and designers, and could teach them how to apply those solutions in their business.”

In the infancy of septic system use, Machmeier was a valuable advocate for the contractors who did this important work, Anderson said.



“There was no one I have seen who was a better promoter and supporter of the industry,” he said. “He backed pumpers and installers up when the EPA and state regulators looked down on their work, and he raised up all of the good the industry has done.”

Machmeier was preceded in death by his wife of 60 years, Joretta, and sons Todd and Philip. He is survived by his son, Bruce and daughter Ann Machmeier, grandchildren, and his second wife, Marlys Danielson. He was buried in his hometown of Mondovi, Wisconsin. □



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Using a Secondary Barrier

Regulations and options for safety covers are increasing, and with good reason

By Sara Heger

The way industry professionals maintain onsite wastewater treatment systems can directly impact the safety and lives of people living nearby. Ensuring that manhole lids are secure and that the system includes a secondary safety device can protect health and save lives.

As an industry, having access to components such as septic and pump tanks and ATUs is necessary and facilitated by large-diameter manhole access at grade. Some regulations may still allow septic system manhole lids to be buried with 6 to 12 inches of soil, but the general regulatory trend has been to bring all components needing regular maintenance to grade. Unfortunately, too often a tragedy occurs in a tank when a child falls into the tank because the lid was damaged, not secured or missing. Improperly secured manhole covers, or damaged covers, pose a significant hazard to the public who typically does not understand the risk. A missing lid poses a risk to young people, who may inadvertently fall into the tank due to curiosity or misstep.

A vast majority of septic system codes and national standards require the lid be secured by:

1. Weight (59 or more pounds)
2. A twist lock cover which requires special tools for removal
3. A hinge and hasp mechanism with corrosion-resistant fastener
4. Bolted in base with tamper-resistant (nontypical) bolts or screws
5. A lock, possibly a chain and padlock

Material matters

Manhole covers should be constructed of durable noncorrosive material and if exposed at the ground surface, also UV-resistant. Unfortunately, manhole covers typically made of concrete or thermoplastic can be damaged, not properly bolted or secured in place, or not replaced following maintenance. Heavy traffic over the system, landscaper damage, use of improper materials, incorrect installation and inappropriate replacement can all render a situation unsafe.

Taking action

Due to the documented tragedies, Connecticut, Indiana, Kentucky, North Carolina, Texas, and some regional health districts in Michigan now require a secondary safety device under the manhole lid. Starting in September 2024, Oklahoma will require a riser safety screen as well. These requirements apply to septic tanks, ATU trash tanks, ATUs and all

pump tanks. These requirements typically only apply to new systems, but installers and service providers should consider adding these to existing systems during repairs or service visits. There is currently no national standard in the U.S. requiring secondary barriers in septic system manholes. This is an item that could potentially be added to ASTM C1227 (concrete) and IAPMO/ANSI Z1000-2019 (concrete, fiber-reinforced polyester, thermoplastic). As an industry, we should support local and national efforts to prevent tragedies through the addition of a simple, low-cost system component.

In Canada, the CSA Group develops and updates standards for many products including septic and holding tanks. In 2021, CBA B66:21 was updated to require a secondary safety device in all access openings larger than 8 inches. Except for Quebec, the provinces are implementing the requirement across Canada. The CSA B66 standard is cited in several U.S. regulations, including Maine, New Jersey, Oklahoma and Utah.

The secondary safety device is a device used in conjunction with risers as an additional protective measure to prevent accidental entry to septic system manholes. It is placed beneath the primary lid of the riser and provides an added barrier if the riser lid is not properly secured, replaced, damaged or malfunctions. The secondary safety device will prevent people and animals from falling through the lid into tanks. Safety barriers mitigate the danger by providing an added layer of protection against children, pets, and others from accidental or unauthorized access to tanks. It can be covered within a cover on the ground surface, or a device placed in the riser such as a screen or net.

Educate

When installing a new system, making a repair, or doing service work, demonstrate to homeowners how to check tank covers between service visits to make sure lids are in place, screws are securely fastened and there is no cover damage.

If kids are on site, consider showing them what is inside to “take away the mystery,” explaining the risks associated with tank entry (e.g., deep liquid, poisonous gas) and give them respect for the dangerous environment. When working with safety nets and barriers it is important that the septic professional or property owner understands that protection from falling into the tank needs to be 100% of the time. If you walk away from a tank lid to get a tool or part, protection from falling in must be placed before you leave.

Educational materials should be provided to property owners and include safety related information. The NOWRA Onsite Wastewater Treatment System User Guide can be printed out or emailed to customers.

Companies should educate workers as well on the risks associated with unsafe, unsecured or missing lids, and paperwork on site should include clear reminders to check lid security one last time before leaving the site.

If an unsafe lid is observed when doing repairs or service work, it should be repaired or blocked off. Supplies such as safety tape and posts to block off the area should be on all service trucks along with material likely needed for lid repair and replacement. Safety related issues should never be listed as optional repairs. A \$50 repair could save a life.

What's available

There are several great devices available for risk mitigation purposes and regardless of regulations, should be used when installing or repairing systems. Your supplier may have a locally available option or below are national options that could be integrated into new and existing systems.

Infiltrator Safety Star system

A fiberglass-reinforced screen which fits in the uppermost riser stack of Infiltrator 24-inch risers.



Infiltrator Safety Star system

Polylok Safety Screen

A safety screen which is designed to fit into the uppermost rise stack of Polylok risers or with the 24-inch universal unit, it can be placed into PVC ribbed, HDPE corrugated and concrete risers. They also have a riser pan which allows a precast concrete tank manufacturer to pour a 59-pound concrete plug in the riser pan which sits at the base of the tank, which is then finished with a plastic cover.



Polylok Safety Screen

Norweco Safety Net

A riser safety net made of polyethylene with 316 stainless steel hardware which can be installed in plastic and concrete risers up to 24 inches in diameter.



Norweco Safety Net

Orengo Tank Shield

A co-polymer polypropylene safety screen compatible with fiberglass-reinforced plastic and PVC-ribbed risers.



Orengo Tank Shield

Sim/Tech Filter Security Net

Security net made of polypropylene attached with stainless steel eye bolts which can be placed in plastic or concrete risers.



Sim/Tech Filter Security Net

Tuf-Tite Safety Lids

The plastic safety lid is designed to fit within the Tuf-Tite septic tank risers and lids. The safety lid is secured to the riser ledges using four stainless steel safety screws. For added safety, both the riser and safety lids can be filled with concrete. □



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