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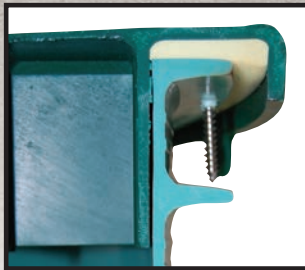
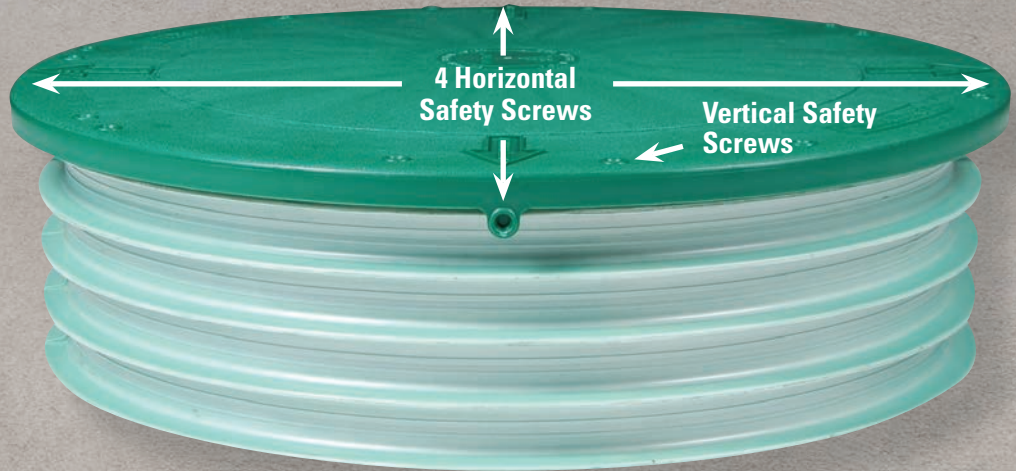
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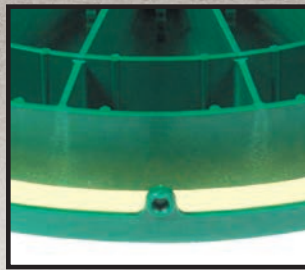
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The Fixer Upper By Ken Wysocky

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Andrew Gunia, right, owns A Advanced Septic & Construction Services with his sons, Joshua (left) and Jeremiah. They are shown pausing at a work site in Bonney Lake, Washington. (Photo by Karen Ducey)

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Established in 2004, Onsite Installer™ fosters higher professionalism and profitability for those who design and install septic systems and other onsite wastewater treatment systems.



Hands-On Iowa Onsite Training Keeps Going After 12 Years

The state's program involving installers and service providers at Heartland Hills includes a variety of test systems serving 14 homes

A combined hands-on professional training program and charitable effort by the Iowa Onsite Waste Water Association celebrated its 12-year anniversary recently. And taking a look back at this successful program prompts the question why all state onsite associations aren't following suit.

After partnering with the Waterloo, Iowa, chapter of Habitat for Humanity, IOWWA coordinated the installation of a drip system in 2005 for a cluster of homes that the nonprofit housing organization was rehabilitating. *Onsite Installer* covered that project at the time. Since then, the two groups have built a successful relationship that helps low-income buyers obtain housing and gives IOWWA a training ground where members can install and monitor a variety of onsite technologies.

Today, there are 14 Habitat homes at Heartland Hills, and all of the onsite systems have been installed at no or little cost to the homeowners. IOWWA has consistently maintained each of the systems and regularly brings out installers, inspectors and maintainers to learn more about the technologies used. With younger members getting involved in the association, new systems went online in 2016, and this summer, and the

group held a two-day workshop involving onsite professionals and product manufacturers who donated time and materials.

A GRAND IDEA

The story of Heartland Hills started when Habitat obtained officers housing at an abandoned Naval Communications base near Waverly, Iowa, and planned to turn the ranch homes over to families in need. The idea of involving IOWWA came from Doug Bird, then the public health sanitarian for Bremer County and an IOWWA member. Bob McKinney, owner of RD McKinney Plumbing & Excavating, in Waukee, Iowa, was on board from the start, organizing donations and volunteer labor to install the first system for four homes. And he continues today, carrying out twice-a-year maintenance for all of the homes.

Trevor Dickerson, past president of IOWWA and a septic designer for MMS Consultants, heads the association's education committee and is working to reinvigorate the partnership with Habitat and build on the training program.

"Habitat is a great cause. During this last workshop, Habitat people came and talked to us about the organization, giving us a little bit of understanding about how these people are getting these houses," Dickerson explains. "It's a positive thing for us to be associated with, especially for us to have the opportunity work in a whole neighborhood like that."

A little background on Heartland Hills is in order.

Habitat purchased part of the former military base for \$1 and assessed the viability of 24 neglected homes that were once served by a lagoon system for wastewater. The part of the property that included the lagoon was sold earlier; shared lagoons are no longer allowed for residential service in Iowa, so another wastewater solution was needed. About half of the houses were too deteriorated and were razed, while the organization set out to repair the other homes. At the same time, Habitat started building new replacement homes on some of the sites.

◀ Tom Rankin Jr. of T.G. Rankin Co. talks to service providers and installers about the American Manufacturing Co. drip distribution field at Heartland Hills. (Photos courtesy of the Iowa Onsite Waste Water Association)



➤ Trenton Pohl from Iowa Water and Waste Systems discusses the Orenco Systems AX20 recirculating textile filter treatment system installed at Heartland Hills, a Habitat for Humanity project in Waverly, Iowa.

▼ Drew Ryken of Premier Tech Aqua shows an Ecoflo Coco Filter being delivered to Heartland Hills.



VARIETY OF SOLUTIONS

McKinney explained that poor and disturbed soils prevented the use of conventional septic systems. The lots, laid out in a horseshoe, are about 60 feet wide and 100 feet deep. Habitat families own the homes, but don't own the land — much like a condominium arrangement — so it was practical to experiment with a variety of onsite technologies and use cluster systems where it was logistically feasible.

The first system includes different branded septic tanks (both concrete and poly) on each of the four properties, with effluent running from the tanks to a fixed activated sludge treatment (FAST) bioreactor from Bio-Microbics. Treated water then collects at a 2,000-gallon pump tank and is dosed to four zones of drip tubing (3,600 feet total) laid out in a common area.

Through the years, a variety of technologies were installed using drip, open discharge (allowed in Iowa), and at-grade systems. The most recent is a project installed in August using a Waterloo Biofilter System. The systems have been experimental, first of their kind in the state, or applications that are seldom seen in Iowa, McKinney explained.

McKinney has been responsible for maintenance from the start. He is paid \$25 per month per system by Habitat to provide inspections, service and necessary repairs. As long as homeowners do not abuse the systems, they are not billed for any repairs. Through user education, abuse has been limited to one instance and the homeowner made changes that eliminated problems, McKinney says.

McKinney reports replacing a few pumps. Pumping is performed routinely. When McKinney finds one tank with sludge levels high enough to pump, all of the neighborhood tanks are pumped. This happens every three years on average.

There have been no system failures, but in one instance, a Pirana aeration unit was installed to restore proper treatment in a system hampered by a homeowner using a laundry list of medications, McKinney says. The residents have for the most part followed guidelines for care and have been understanding of the many intrusions by the dozens of onsite workers who regularly visit Heartland Hills.

A GOOD DEAL

“They all understand I'm coming up there to do some training and know there will be 30 to 40 people walking across their yards,” McKinney says. “We keep in mind these are people's homes, and we respect that. It's been really good as far as that goes.”

Habitat and the homeowners are getting a pretty good deal, McKinney asserts. He estimated the first cluster system was valued at \$140,000 but that dozens of onsite pros donated their time for the installation and many onsite product manufacturers donated their components as a teaching tool. And that has continued as many manufacturer's reps make the trip to Waverly to show how their products perform in a real-world setting and promote the use of new technologies throughout the state.

“It's good to see it in real life and not in a showroom. It's one thing to see something nice and clean and pretty; and understanding how it works is a different thing.”

Bob McKinney

“It's great training for anyone who wants to learn to service and install,” McKinney says. The 60-year-old service provider says he also benefits from the maintenance and training program. “I get an education, too. When something goes wrong, then I learn what went wrong and how to fix it. Instead of going off to a school, I'm going to the School of Hard Knocks.”

McKinney has one more goal for the training program at Heartland Hills before he plans to retire in about five years. He's designing a small building where a variety of UV disinfection systems can be observed and have their effluent tested. His plan is to route the effluent from several open-discharge systems and combine it in the building, which will have a

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large tank buried two feet below the surface where several UV systems will treat the wastewater side-by-side.

“A lot of places in Iowa, they don’t understand disinfection period, and in a lot of areas of Iowa they’ve never seen these systems,” McKinney says. “It’s good to see it in real life and not in a showroom. It’s one thing to see something nice and clean and pretty; and understanding how it works is a different thing.”

ON THE HORIZON

After many years maintaining onsite systems, McKinney says there’s one area where he’d like to see a technological jump: digital communication between remote systems and the maintainer.

“It’s only getting better. But is it where it needs to be? No,” he says of the advances he’s seen. “One thing I’d like to get done is telemetry that’s affordable and can come into the service provider’s computer or phone so we know what is actually happening and can go out with the right material to repair rather than just get an alarm call.”

Things are changing in the onsite community in Iowa, and the changes are reflected across North America. More technologies are coming to the forefront to better treat wastewater. Also, younger onsite professionals are coming up, and they need to be prepared to serve the needs of customers. Dickerson recognizes the changes, and he hopes the program in Iowa can be a model for training in other states and provinces.

“The older guys are starting to get out, and the younger generation is coming on,” he says. “So it’s nice that we have this opportunity to use experimental systems and see how they work.”

HOW ABOUT YOUR ASSOCIATION?

I know many states have started some form of hands-on training. However, I wonder if any others have teamed up with a group like Habitat for Humanity or have installed and monitored as many systems as the folks in Iowa. Has your state association considered approaching Habitat to work on one of its thousands of projects across the U.S. and Canada? Or are there similar developments in your state that you’d like to shine a light on? If so, please contact me at editor@onsiteinstaller.com, and we can share your projects. ▣

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An Effort to Educate

Sometimes all it takes to distance your business from the competition is being a patient teacher. Most people don't understand how their septic systems work, and going the extra mile to educate them will be appreciated. Read about Legacy Septic's detailed process in this online story. onsiteinstaller.com/featured



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FINDING SOLUTIONS

Drainfield Rehab

Andrew Gunia of A Advanced Septic always tries to solve drainfield issues before resorting to replacement, which his customers appreciate. The company is featured in the magazine this month, and this online story further explores his work restoring drainfields and educating his customers on septic upkeep.

onsiteinstaller.com/featured



NO PLACE TO GO

**Modifying Existing
Soil Treatment**

When dealing with a small lot, sometimes the only option for a new soil treatment area is to use the same location as the current system. It's not ideal and should be a last resort, but here are some potential solutions when you run out of room.

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INSTALLER PROFILE



THE FIXER UPPER

Washington state's A Advanced Septic & Construction Services focuses on rejuvenation and setting up existing septic systems for easier inspection and maintenance

By Ken Wysocky



When Andrew Gunia established A Advanced Septic & Construction Services in 2006, he built a business based primarily on drainfield rejuvenation instead of pumping septic tanks and installing septic systems.

“Our industry was way too quick to decide that a 20-year-old system, for instance, needed to be replaced,” explains Gunia, 55, who owns the Sumner, Washington-based company with his sons, Joshua, 34, and Jeremiah, 33.

“In a previous job, I saw that homeowners often didn’t need a new drainfield, but I felt that no one was taking time to figure out what was

needed,” he continues. “There was a piece missing in the equation: Figure out what the problem is before deciding on a solution. So I founded a company that specializes in restoration and rejuvenation and that installs new systems only when all other options are exhausted.”

There are compelling business reasons to take a contrarian approach. For starters, paying roughly \$5,000 to rejuvenate a drainfield is much more attractive to homeowners than a \$20,000 system replacement. Second, the service generates good profit margins. Moreover, by rejuvenating drainfields, A Advanced establishes relationships that later can lead to pumping



◀ Andrew, left, and Joshua Gunia confer about a project. In the background is a 2000 Freightliner outfitted by FMI Truck Sales & Service with a 3,600-gallon Beall aluminum tank fabricated by Wabash National and using a Masport pump. (Photos by Karen Ducey)

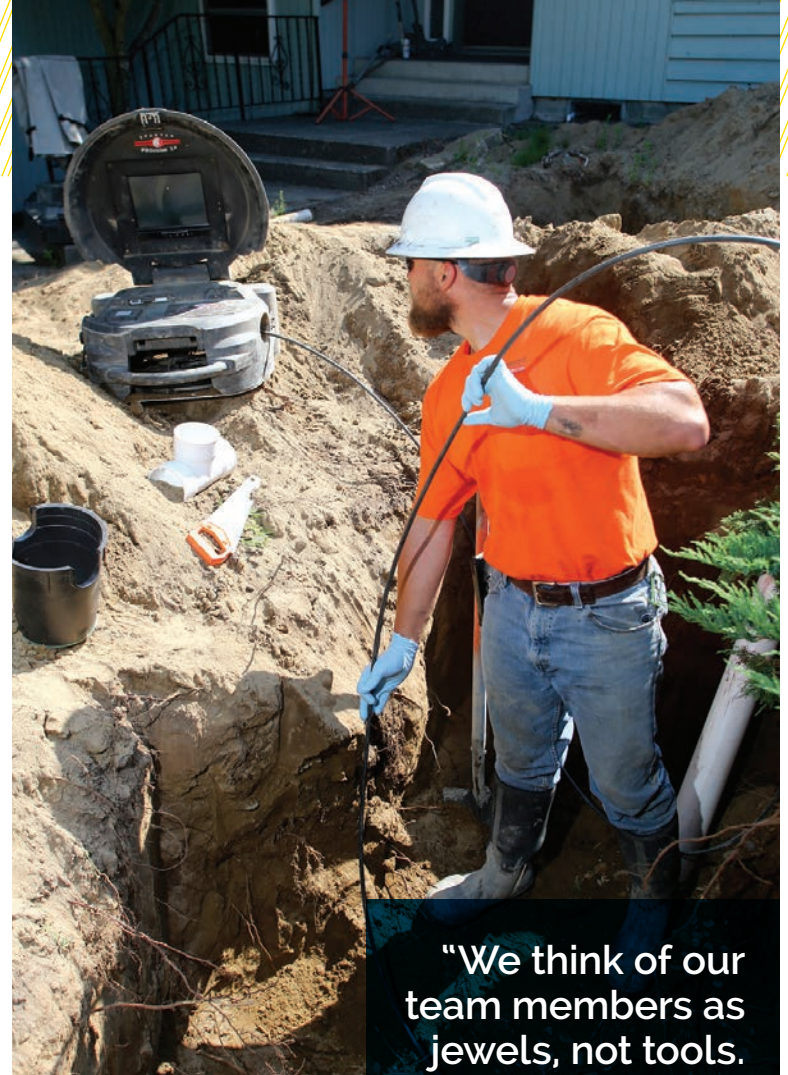
▶ Aaron Huss uses a Spartan Tool camera system to check on the condition of drainfield pipes at a residential property.

business from customers who appreciated how the company saved them thousands of dollars, Gunia says.

In addition, many homeowners in the company's service area — about a 60-mile radius around Sumner, just outside of Tacoma and 35 miles south of Seattle — don't have large lots. So rejuvenating an existing system often made more sense than installing a new one. "If the second system fails, there's not much recourse for customers after that," he says.

So what does Gunia mean by rejuvenation? Essentially, he says it centers on a comprehensive, end-to-end inspection of a septic system to determine what's causing drainfield problems. That includes examining inlet and outlet baffles and jetting the laterals to remove any buildup sludge. The company also uses TerraLift machines (formerly manufactured by the TerraLift International Family of Companies but now built by AerraTech) to aerate and renew the soil around the system.

"We can make systems work again through what I call invasive maintenance," he says.



"We think of our team members as jewels, not tools."

That approach has been huge in our company's success. When someone digs in and wants to learn and grow and is committed to our journey ... we take care of them."

Andrew Gunia

CHOOSING A FOCUS

When Gunia started out, system rejuvenation generated about 80 percent of the company's annual revenue. Currently, it stands at about 30 percent, but Gunia says that's not because system rejuvenations have decreased; instead, the company's other business segments — especially residential construction and remodeling services — have grown dramatically, which means rejuvenations represent a smaller piece of the overall revenue pie. "We still restore one drainfield a day year-round and sometimes two a day," he says.

Gunia found his inner entrepreneur in a roundabout way. After dropping out of high school and joining the U.S. Air Force Reserve, he got a job at a septic pumping and utility-line installation company. The owner made a deal with Gunia: In exchange for training to run heavy equipment, which was Gunia's dream job since he was a youngster, the 22-year-old would run the company's portable restroom division for two years.

But after 12 years, during which he was promoted to a project foreman and then a job estimator, he decided to strike out on his own. "My lifelong dream (of running heavy equipment) didn't turn out like I expected," he



A Advanced Septic & Construction Services Inc.

- Location:** Sumner, Washington
- Owners:** Andrew, Joshua and Jeremiah Gunia
- Founded:** 2006
- Employees:** 44
- Service area:** 60-mile radius south of Seattle
- Specialties:** Drainfield rejuvenation, onsite installing, septic service and excavation
- Associations:** Washington On-Site Sewage Association
- Website:** www.aadvancedservices.com



recalls. “I realized what I was missing was the game — the game of business ... deciding my own destiny.”

Gunia’s decision to focus on rejuvenation as a high-margin niche market was critical to his company’s success. Another key factor: Gunia offers a money-back guarantee on his company’s work for one year. “If you can’t warranty your work, then you probably shouldn’t be doing it,” he asserts. “Early on, we went back many times on our dime and made corrections as we learned our craft. But now we have it down to a science, and our call-backs are as low as 2 percent.”

CAREFUL EVALUATION

The business also grew because Gunia established a uniform protocol for evaluating septic systems. The procedure is similar, regardless of the many types of septic systems Gunia says he has seen emerge over the decades — from gravity systems with concrete tile pipe to gravity systems with PVC pipe and two-compartment tanks, to pressurized systems with an outlet baffle installed in front of the pump chamber. “Now, about 60 percent of the systems we install are aerobic treatment units,” he says.

The first step is finding out how customers use their systems, followed by a detailed inspection that starts in front of the tank and ends in the drainfield. “We make sure that every lateral is getting its fair share of

“Oftentimes I’m the biggest obstacle to growth by micromanaging. I want to ensure that if I’m not here, our 44 team members’ families will still have viable incomes.

That’s my job and goal for the future.”

Andrew Gunia

effluent — that there aren’t any root blockages,” he says. “We also have to make certain no biosolids are leaving to the drainfield, which means making sure that baffles are correctly installed.”

If a system doesn’t have risers, A Advanced installs them to grade as a matter of course for easier troubleshooting and minimizing excavation work down the road. Other upgrades might include installing inspection ports on individual drainfield laterals.

“If the D-box is buried, we install risers there as well,” he says. “We basically do everything we can to restore the system to its original state. We correct things as needed, such as replacing broken or settled pipes and removing root infiltrations.”

But Gunia points out that not every failing system is a candidate for rejuvenation. He says it only makes sense for systems that have worked properly for a long period of time. A system installed a year ago that’s now failing, for

◀ Aaron Huss, left, and Taylor Beaulieu operate a TerraLift machine from AerraTech to fracture the soil and restore function to a drainfield.

▼ Technician Taylor Beaulieu uses a Prototek LF2000 locator while completing some system measurements at a job site.



HOW TO ELIMINATE WORKER TURNOVER

When Andrew Gunia talks about employees at A Advanced Septic & Construction Services — the company he owns with his sons, Joshua and Jeremiah — he refers to them as team members. That may sound like a small thing, but it reflects the kind of family-oriented culture he's developed over the years.

"We think of our team members as jewels, not tools," he emphasizes. "That approach has been huge in our company's success. When someone digs in and wants to learn and grow and is committed to our journey (as a company), they're a jewel, and we take care of them."

Gunia says getting young people interested in a career in the onsite industry is hard enough. And it gets more complicated if they also need to obtain a commercial driver's license and a license from a local health department. As such, it's important to treat people well, not view them as cogs in a machine.

A Advanced accomplishes that by paying competitive wages and offering benefits such as full medical, dental and vision insurance; reduced-rate cellphone plans; one to three weeks paid vacation; and a 401(k) program with up to a 3 percent company contribution. The company also promotes from within whenever possible and pays for continuing education.

"If anyone does any kind of continuing education, we'll reimburse them for the cost," Gunia explains. "All they have to do is bring in a receipt and proof that they earned a passing grade. We want our team members to open up their minds to learning new things. It benefits them, and it benefits us."

"Limiting turnover is a huge component in our success because it promotes consistency," he adds. "They become familiar with homeowners and their septic systems. Customers are more likely to call us (for repeat business) because of the relationships they've established with our route drivers."

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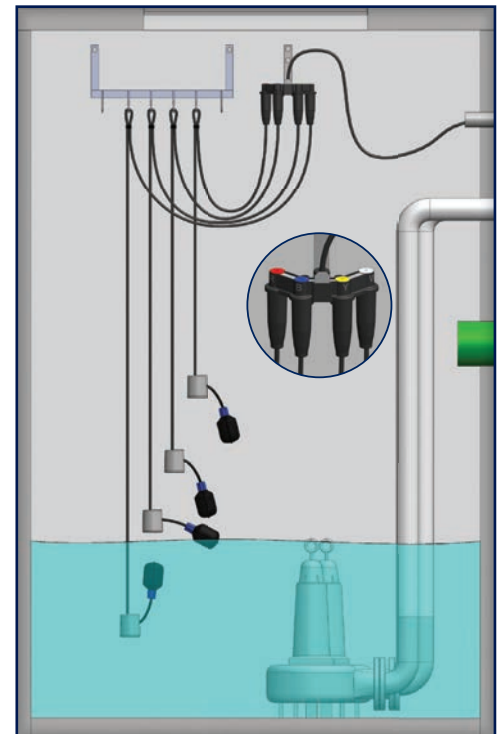


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◀ Driver Adel Maldonado pumps a septic tank for A Advanced Septic & Construction Services. In addition to a specialty in drainfield restoration and other installing work, the company runs five vacuum trucks.

“By hiring out the waste hauling, it’s less wear and tear on the trucks, and it allows our trucks to be out working and earning revenue instead of hauling waste.”

Andrew Gunia

“They pick up 8,400 gallons a day and twice on Thursdays and Fridays, so we have enough capacity on weekends — you never know what weekends will bring,” Gunia says. “By hiring out the waste hauling, it’s less wear and tear on the trucks, and it allows our trucks to be out working and earning revenue instead of hauling waste.”

Every so often, the company hauls its own waste, leaving for Centralia at 4 a.m. “At that time of day, it’s only about a 1-hour round-trip on I-5,” Gunia explains.

A Advanced currently runs five vacuum trucks: A 1999 Sterling AT9 built out by Erickson Tank & Pump with a 3,200-gallon steel tank; a 2000 Freightliner C1206 outfitted by FMI Truck Sales & Service with a 3,600-gallon Beall aluminum tank fabricated by Wabash National; a 2003 Freightliner CL120 with a 3,600 steel tank built by Erickson Tank & Pump; and two Peterbilt T-365s (2011 and 2012) built out by Pik Rite with 4,800-gallon steel tanks. All five trucks are equipped with Masport pumps, 50-gallon water tanks and onboard water jettors.

The company also relies on eight excavators made by Kubota Tractor Corporation and Caterpillar; three Freightliner M2 box trucks; and three dump trucks — two Freightliners and one Kenworth Truck with dump bodies made by Sturdy-Weld Equipment & Design, Columbia Body Manufacturing Co. and Reliance Trailer. In addition, the company owns two backhoes, made by Terex and Caterpillar; a John Deere bulldozer; five cart-mounted water jettors made by DEWALT Industrial Tool (4,000 psi at 3.5 gpm); pipeline-inspection camera systems manufactured by Spartan Tool and Vivax-Metrotech Corp.; and a Prototek LF2000 locator.

example, is probably not suited for rejuvenation. In that case, a bad design is more likely the culprit and system replacement is a logical solution, he says.

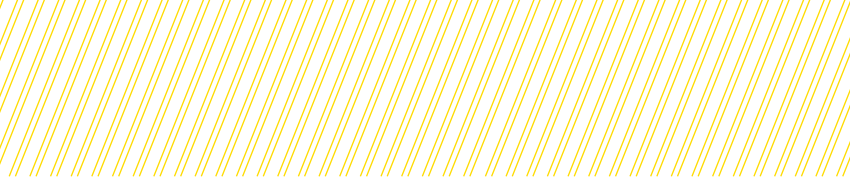
“You always have to understand why the system failed,” he explains. “Was it from old age or from the homeowner misusing it? If a system was designed for three people and eight people live at the home, rejuvenation may not be the answer because the system would probably fail again anyway. Or if a homeowner is derelict and pouring grease down the drain constantly, using a garbage disposal excessively, or not pumping out the tank often enough, the system will fail again. In the end, it’s not complicated — it’s all about common sense.”

Another key to the company’s success: kid-glove treatment for customers’ landscaping. “New system installations can result in a huge expense at the end of a project to restore the landscaping to its previous condition,” Gunia says. “But at the end of the day, we work our way out of there and you can’t tell that we’ve been there.”

“What we do is a lot like today’s surgeries,” he continues. “The doctor goes in at one location and all you see is a few incisions. My favorite phone calls are from customers who say, ‘I thought you were going to fix my drainfield today, but it looks like nobody was here.’ We even take photos of the work if the customer isn’t home while we’re working so we can prove we were there. At noon, a yard might look like a bomb went off, but by 4:30 p.m., you’d never know we were there.”

PUMPING EFFICIENCY

A keen eye for minimizing expenses also spurred the company’s growth. The firm’s two 20,000-gallon holding tanks stand as a good example. Instead of making a traffic-choked, 3-hour round-trip drive on busy Interstate 5 to Centralia, home to the nearest disposal site, A Advanced trucks off-load waste into the holding tanks. From there, a third-party waste hauler pumps septage into a tanker trailer and transports it to the plant.



Depending on site needs, the company uses AfterShock, made by Cape Cod Biochemical Company. This bacteria-based product is designed to help restore drainfields' drainage capacity. "We got introduced to AfterShock at a WWETT Show," Gunia says. "Ever since we started adding that chemical to pump tanks or drainfields, our callbacks decreased even further."

Gunia says every vacuum truck is equipped with a Crust Buster agitator built by Schmitz Bros. LLC, which he credits for reducing employee fatigue and back strain. They also allow trucks' vacuum pumps to work more efficiently and with less stress, which results in less maintenance, he says. On a typical residential tank, Gunia estimates a Crust Buster saves anywhere from 10 to 15 minutes per pumping.

JOB SATISFACTION

Gunia says he's surprised that a career he never expected turned out so well. "It's been incredible and extremely gratifying," he observes. "We're solving customers' problems and saving people money. The 'game' of being in business — working with customers, designers and friendly competitors, and all the other components that go with running a business — is extremely fulfilling."

Looking ahead, he says he firmly believes in the adage that if a business isn't growing, it's dying. "There's nothing in between," he asserts. As such, he sees more growth in the years ahead, but not the kind of grow-bigger-at-all-costs mentality that would hurt the family-oriented culture he's worked hard to foster.

"I have no desire to be the biggest game in town," he says. "That's corporate America and not a family-oriented journey. If you make the business all about the journey with your team members, you always do the right thing."

"I see my main job going forward as focusing on sustainability," he continues. "I need to remember to get out of the way because oftentimes I'm the biggest obstacle to growth by micromanaging. I want to ensure that if I'm not here, our 44 team members' families will still have viable incomes. That's my job and goal for the future." □

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Pay Attention to Filters on Drip Distribution Systems

Preventing damaging infiltration and promoting appropriate effluent flow requires diligent operations and maintenance compliance

By Jim Anderson and David Gustafson

We have heard questions from time to time about operation and maintenance of drip filters. These discussions prompted comments from some service providers as well as a manufacturer. We wanted to share the information we learned from these comments in hopes that it helps you think about the drip system filters you install or service.

In previous articles, we've described three possible filtering devices for drip systems: sand filter, screen filter and disc filter. Screen and disc filters are the two most common types. These filters are intended to catch and remove larger particles remaining in the wastewater before it is delivered to the dripfield. Over time, depending on how "clean" the wastewater is that's going into the filter, they will plug and require replacement or cleaning. Most of the systems today have an automatic backwash for the filters that's either set to operate when there is a pressure differential from one side of the filter to the other, indicating plugging, or at some set time interval.

One of the first operation and maintenance procedures when servicing a drip system is to check the filter holder to make sure the filters are still there. A common homeowner fix is to remove the filters if they plug frequently, and once they figure out that the filter is the problem, they remove it.

A common homeowner fix is to remove the filters if they plug frequently, and once they figure out that the filter is the problem, they remove it.

FILTER SWAP

The filters should be removed and cleaned manually during each service visit or at the interval specified by the manufacturer. This can be done using water with a disinfectant. Since it is usually easier to do this cleaning back at the shop, most service providers swap out the filters and take the dirty ones for cleaning. At the same time, the automatic backwash feature should be tested for proper operation.

Filters that are manually cleaned have a valve on the bottom that allows removal of larger particles and grit. After cleaning, make sure the valve is in the proper position.

Service providers with extensive drip system experience have observed that organics that are commonly suspended in treated wastewater are soft

enough to be pushed through screen filters. As a filter clogs, the differential pressure across the screen media increases and can be enough to push these soft organics completely through the screen and off into the drip tubing. Even if these organics are not pushed all the way through the screen, they can get pushed partially through and become embedded in the mesh so tightly as to be difficult to scour free in any flush cycle or manually clean with brushes or high-pressure water. Many manufacturers now recommend controlling the differential pressure to a lower value than previously recommended.

In many cases, the flushing design of manual screen filters is only intended to release hard materials (like sand) from the filter basin. It's not intended — and therefore not capable — for clearing materials that get trapped in the screen mesh. Of the manual screen filters that do intend to clean the screen mesh of embedded particles, cleaning is dependent on the shearing action of the water flowing by the inner surface of the screen as it exits the basin through the open flush port and valve. Many screen manufacturers publish values for minimum flow that's required through their filter to accomplish flushing. One item to check is whether this level of flow is achieved through the flushing operation.

DISC FILTER RECOMMENDATION

Most manufacturers recommend disc filters for wastewater application in drip systems. They do a better job of trapping soft, malleable particles and, therefore, a better job of protecting the downstream components, such as valves and emitters. One problem with disc filters is that between cycles bacteria and other organisms grow between the discs. Over time, this organic material will contribute to plugging the filter.

This type of growth probably occurs in screen filters as well. Reversing the flow through the filter to remove particles trapped inside the filter media — depending on frequency and flow — can reduce the amount of materials that migrate into and get trapped in the disc filter media. If performed properly, this surface flush can extend the time between a needed manual opening of the filter to clean between each disc. Manufacturers again provide values for the flow necessary to clean the filter.

At least one manufacturer addressed the growth of organic material between the discs by adding a bactericide to the plastic of the disc. This has shown good results in reducing the growth and prolonging the period between manually cleaning the discs.

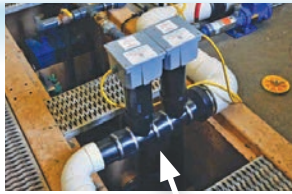
If you have other observations about operation and maintenance issues for drip distribution systems, we would like to hear from you. □

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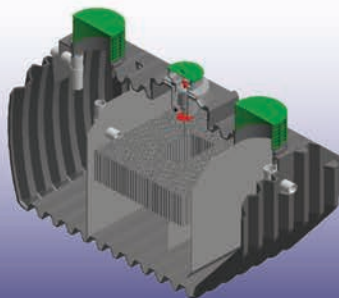
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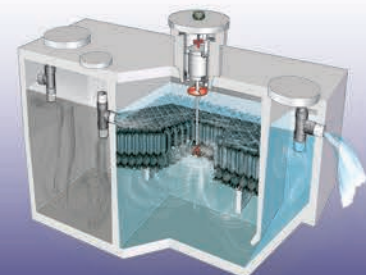


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SYSTEM PROFILE



Wayne Green (foreground) and Jovany Sandoval from Green Construction Management prepare to shoot grades with a Spectra Precision/Trimble LL500 laser level. (Photos courtesy of Green Construction Management)

It's an Uphill Battle for a Connecticut Residential System

Intensive excavation, a Scavenger effluent pump and Eljen Corporation treatment modules help create a level playing field on a challenging home site

By Scottie Dayton

Sewage percolating from saturated ground spelled trouble for the owners of a three-bedroom home in Newtown, Connecticut. The couple hired an engineer whose system design required removing the water and gas lines to install, and it didn't meet setbacks. The local health department rejected the plan.

A friend of the couple recommended Mark Lancor, P.E., principal engineer at DYMAR in Southbury, Connecticut. Lancor took Mark Green, owner of Green Construction Management in Waterbury, Connecticut, with him to do soil tests. "The only area for a drainfield that met setback requirements was 92 feet up a 1:1 wooded hill behind the house," says Green. "The Mantis leaching system from Eljen Corporation had enough size reduction to fit that space." The product is approved only in Connecticut.

Two weeks of the three-week installation were devoted to site preparation, drainfield work and grading. Gravity was Green's greatest challenge, and rain was his greatest fear.

SITE CONDITIONS

Soils are loam with weathered rock at 33 inches and a percolation rate of 1 inch per 12 minutes. The hill on the half-acre lot rises from 27 to 45 degrees near the top.

SYSTEM COMPONENTS

Lancor designed the system to handle 750 gpd. Major components are:

- a 1,000-gallon dual-compartment Low-boy septic tank with Polylok Inc. / Zabel inlet baffle, effluent filter, risers and covers (tanks and distribution box from United Concrete Products)
- a 1,000-gallon dose tank with 1/2 hp ABS EF05W Scavenger effluent pump (Sulzer Pumps Solutions Inc.)
- 13 Mantis 536-8 treatment modules (Eljen Corporation)
- a control panel and CS1200 tank alarm (CSI Controls)

SYSTEM OPERATION

A 4-inch PVC house lateral runs 32 feet to the septic tank, and then effluent flows 10 feet to the dose tank with an on-demand pump. It sends 26 gallons 92 feet through a 2-inch force main to the distribution box. The rise in elevation from the dose tank to the box is 20 feet.

➤ Wayne Green from Green Construction Management shovels sand to hold the fabric in place.

▼ Jovany Sandoval (foreground) and Wayne Green from Green Construction Management use a Spectra Precision/Trimble LL500 laser level with grade rod (Crain surveyor style) to check elevations before covering the modules with an inch of sand.



The drainfield has a 45-foot in-line trench connected by a 22-degree 4-inch elbow to a 20-foot in-line trench. A 4-inch pipe in the distribution box connects to the factory-installed pipe near the top of the leaching modules. Holes in the pipe are at 5, 7, and 12 o'clock. Each 5-by-3-by-1.5-foot-high unit has eight vertical Bio-Matt filters (Eljen Corporation) separated by 3-inch-wide compartments (spacers) filled with ASTM C33 sand. Open air channels within the filters promote fixed aerobic bacterial growth on the geotextile fabric. Final polish occurs in the sand bed beneath the modules.

INSTALLATION

Green, his father Wayne, and laborer Jovany Sandoval built one temporary silt fence 3 feet in front of the asphalt driveway and another fence 77.5 feet up the hill from it. They spent two days cutting and clearing the hill, which involved half the backyard.

A swale on top of a 6-inch PVC perforated underdrain enclosed a 2,363-square-foot lawn in almost a complete semicircle. Because the septic code specified tight pipe for underdrains within 25 feet of septic tanks, Lancor cut off the top 8 feet of the arch and replaced it with a 45-foot straight run of SDR 35 solid pipe.

System Profile

Location: Newtown, Connecticut

Facility served: Three-bedroom home

Designer: Mark Lancor, DYMAR Corp., Southbury, Connecticut

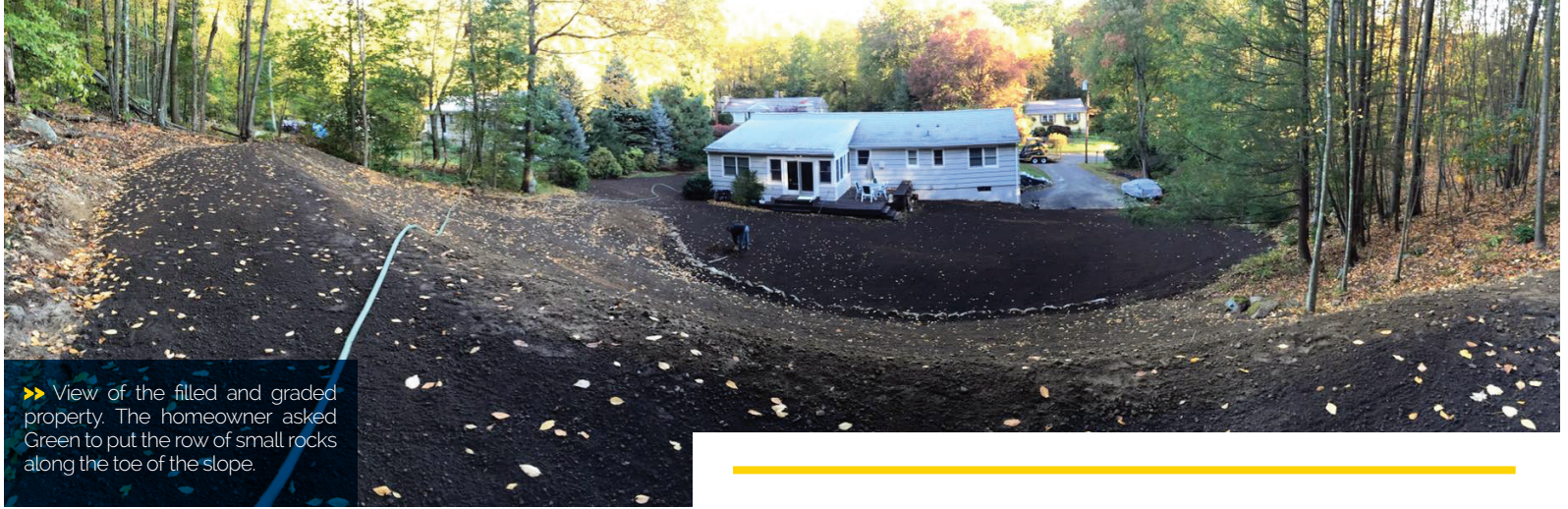
Installer: Mark Green, Green Construction Management, Waterbury, Connecticut

System repair: Mantis leaching system with low-pressure dosing

Hydraulic capacity: 750 gpd

“We hand-dug to expose the existing drain, and then cut it at 27 feet from the septic tank,” says Green. “As we dug the new trench across the yard, our shovels hit ledge in two places, which surprised us.” Green mounted a jackhammer on his rubber-tracked Volvo EC35C mini-excavator and chipped out sufficient rock to complete the installation. The underdrain and swale were backfilled later with topsoil.

To stabilize his machine while preparing the drainfield, Green took fill up the hill and built a level shelf 15 feet downgrade from the trench area. He then used the platform to excavate the 4-foot-wide by 24- to 30-inch-deep



» View of the filled and graded property. The homeowner asked Green to put the row of small rocks along the toe of the slope.



▲ Jovany Sandoval from Green Construction Management mixes mortar in front of the 4-inch pipe connecting the United Concrete Products Low-boy septic tank to the dose tank.

“The quickest and easiest method is to pound away with two-by-fours. Simultaneously, we tramped down the 6 inches of sand on either side of the modules.”

Mark Green

PREPPING MODULES

As Independent Crushing delivered 50 tons of sand, Sandoval transferred it to Green, who placed and leveled 6 inches of it in the trenches. After carrying the 35-pound treatment modules to the drainfield, the crew removed the bottom cardboard supports before setting and connecting 10 units in one trench and three in the short trench.

Then, they removed the modules’ top cardboard supports and began the labor-intensive task of compacting multiple layers of sand in the spacers. “The quickest and easiest method is to pound away with two-by-fours,” says Green. “Simultaneously, we tramped down 6 inches of sand on either side of the modules. Everything settled overnight and had to be checked before we added the final inch of cover sand fabric the next morning.” Sand also extended 6 inches beyond the end of the first and last unit.

After backfilling the area with topsoil and grading it per the plan, Green and the homeowner didn’t like what they saw. The 45-degree slope near the top was too steep to walk up. The homeowner agreed with his plan to haul in more fill and grade the area to a gentler slope.

While Independent Crushing delivered 400 cubic yards of topsoil and Sandoval stockpiled it on the hill, Green excavated the 20-by-20-by-5-foot-deep hole for the tanks. At a depth of 2 feet, the bucket teeth hit solid ledge.

“No one knew it was there because we had no reason to dig test pits near the dry well,” says Green. After the first day of jackhammering, he changed the 5-foot 11-inch-high regular septic tank specified on the design to a 4-foot 6-inch-high low-boy tank. Another day of hammering removed a total of 3 feet of rock. By switching to the shallow tank, Green shortened the time spent hammering by a day and a half.

FINISHING TOUCHES

Able to dig again, Green scooped out a bucketful of soil. Immediately, the hole filled with wastewater. Green dug a sump to contain it, but the soil was so saturated that a septic company had to pump the sump three times. Green bedded the excavation with 6 inches of gravel, and then a driver from United Concrete Products set the tanks.

trenches and scarify the receiving layer. Meanwhile, a truck from Independent Crushing arrived hourly to deliver 200 tons of septic gravel.

“We built solid timber cribbing over the curb, enabling drivers to back over it and come alongside the house,” says Green. “They had only 5 feet to dump and roll out before the raised body would take down a 14-foot-high power line. Its location prevented us from stockpiling more than one load at a time.”

Wayne Green supervised truck traffic, handled the tickets, and shot elevations. Sandoval, operating a rubber-tracked Volvo MCT125C skid-steer loader, shuttled gravel up the hill and along another shelf Mark Green had built close to the drainfield. “From there, I cast gravel into the trenches to make a 3-foot-deep bed,” he says. “Afterward, I rode the excavator up above the trenches to level and compact the stone.”



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The crew also severed the 4-inch cast-iron house lateral 2.25 feet from the basement wall and connected it with a stainless Fernco to a Schedule 40 pipe. Meanwhile, Jeff Carlascio, owner of Carlascio Electric, hooked up the pump tank as well as the control panel and alarm in the garage. “The property had a homemade cinder block septic tank encased in plywood,” says Green. “We abandoned it once the replacement system was functional.”

With mounds of topsoil in position, Green returned to filling in and grading. Working down 15 feet at a time from the top of the trenches, he built shelves and then blended the topsoil to create a 4:1 slope to the street. Randy Olmstead of All Green Hydroseed sprayed a custom mix of grass and wildflower hydroseeds over the disturbed area. “Until this point, one rainy day would have washed everything downhill,” says Green. The dry weather held.

MAINTENANCE

The state department of public health requires pumpouts every three to five years. ■

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Massachusetts Septic and Drain-Cleaning Licensing Proposals Viewed as Burdensome

By David Steinkraus

Two bills in the Massachusetts Legislature concern Frank King, and one of them really concerns him.

King runs Action King Services in Lowell, Massachusetts, and he is a former member of the board of directors of the National Association of Wastewater Technicians. His company handles domestic and commercial pumping, jetting and drain cleaning. Although his company is located in Lowell, it covers a 100-mile radius that takes technicians into Vermont and Maine for some clients.

The bill that really concerns him is H146. Introduced earlier this year, it would create a statewide septic license. That doesn't sound bad, except for a sentence that says a license could not be held by a business.

"It is my belief they want to license each person and that would be a headache. If I have to train people to get a license, I don't know how I'm going to find the help," King says. He also adds that there is already a shortage of people in Massachusetts who hold a commercial driver's license, "and a lot of people don't want to do this work because it isn't clean."

King says he often must hire people fresh from driving school, only to see them quit after they have six months or one year of experience with him. Other job applicants are recent immigrants. They're good people and work hard, but they are not fluent in English and that impairs communication with customers. If a licensing course becomes mandatory, that lack of language skill will effectively close off opportunities for those immigrant workers, King says.

The last time he searched for a driver it took two to three months to find one. Then there's his in-house training process, which requires about a year to complete. And it's not as if he has extra workers. Of the 16 employees at his firm, 11 are driver technicians. Take a couple of vacancies, add someone on vacation, and his staff is down about 30 percent. If the bill becomes law and the license process requires continuing education credits, employers will have more billable time to cover, he says.

"In addition to other clients, we service a supermarket chain that has more than 80 stores. The work of every person counts here," King says.

Licensing is currently done by each municipality through its local board of health, and that works well, King says. He doesn't know where H146 came from, and no one has asked the opinion of pumpers. He's been told the bill will have a hearing in the fall.

The other bill that bothers him is H140. It would order the state Board of Plumbers to establish licensing standards for people who clean drains. Cleaning a pipe to a tank is often part of the pumping service his technicians perform. And again, requiring a license for someone to do this simple work adds another burden to doing business, he says.

This bill is new, but the idea is not. It has been introduced before, during the 2013-14 session and again in the 2015-16 session. Both times it died in committee.

Colorado

The San Juan Basin Public Health Board in Durango is considering rule revisions for onsite wastewater systems that should take effect sometime in the next 12 months. This is the result of new rules required by the state as well as other rules that are optional for health boards. New rules would probably be introduced during the winter in order to take effect between construction seasons, the *Durango Herald* reports.

Three main rule changes are being considered. One rule change would require inspections of onsite systems when a property is sold. Other Colorado counties have experienced a 25 percent increase in the number of permits for repairs and alterations when they began requiring inspections. The second rule change would allow advanced treatment units, provided there is a provision for regular maintenance. And the third rule change would allow people to restore a failing onsite system as an alternative to replacing it.

The health board, which covers two counties, also has the option of enacting a state rule that alters how wastewater system capacity is calculated. To account for the desire of some people to have homes of only 100 to 400 square feet — commonly called tiny homes — the state is allowing for smaller onsite systems. Previously, the smallest system allowed was sized for the wastewater output of a two-bedroom house.

Ohio

Neighbors who started a legal fight to oust a pumping business lost a round in court, but they may appeal the decision. Citizens in Warren County, located between Dayton and Cincinnati, wanted SepTek Services out of their neighborhood. The company has 16 acres for its operation, but under a conditional zoning permit, it may operate on only five of those. In addition, it cannot store, treat or dump septage or biosolids on the land; must plant at least 25 trees and build a berm as a buffer for neighboring properties; and faces limits on the hours vehicles can operate.

Neighbors complained about noise and went to court to appeal the permit granted by the Warren County Rural Zoning Board of Appeals, reported the *Dayton Daily News*. A judge appointed to hear the case said the crucial decision in this matter was actually made some time ago when the county Board of Commissioners allowed a variety of more intensive conditional land uses.

Wisconsin

Some citizens of Gays Mills, a small town in the southwestern part of the state, recently renewed longtime complaints over paying sewer fees, even though they have their own onsite systems.

Bernard and Virginia Murphy have lived in their home for 22 years and have paid the flat rate fee even though their home is disconnected from sewer lines, reports the *Crawford County Independent*. They have paid \$6,000 in fees for a service they have never used.

"We have our own septic system, and it works very well," Virginia Murphy tells the Village Board. She said 26 residences were never connected but have paid \$158,000.

No one on the Village Board was certain when the village implemented the policy of charging people for unused service, but records suggested it began no later than 1990. Harry Heisz, the village president, said he understands the citizens' concerns, but he also said the money they pay is important to the village budget.

Texas

Bastrop County, located southeast of Austin, held a public hearing on updates to its onsite wastewater rules. Among other changes, the rule will allow homeowners with a wastewater license to service and maintain their septic systems. The changes will update the county rules to conform with changes in state regulations.

Another change would require each dwelling to have a septic tank of at least 750 gallons. Philip Merino, the county's environmental and sanitation manager, said requests for systems for tiny homes — dwellings of 100 to 400 square feet — would be handled individually, but owners would likely be required to have a 750-gallon tank.

Indiana

A federal appeals court said a pumper who lost his license without notice or a hearing may proceed in his lawsuit against Brown County. The county is about 20 miles south of Indianapolis.

In 2013, John Simpson's name was removed from a list of county-approved installers after county officials sent a vague notice about a problem on his mother's property, reported *The Indiana Lawyer*. Simpson sued, claiming he was denied his right of due process, but the suit was dismissed.

Simpson appealed the dismissal, and a three-judge panel of the 7th Circuit Court of Appeals agreed with him. "The County had a septic ordinance that plainly described the process for the placement of septic installers on a register and (not so plainly) described the process for their removal," Judge David Hamilton writes in the panel's ruling.

None of the statements in Simpson's complaint show the county had an urgent need to revoke his license without a hearing, Hamilton wrote.

Ontario, Canada

Pumpers in Bracebridge, located about 100 miles north of Toronto, told a government committee that the area's high dumping fees are killing their local businesses.

Everybody's in trouble, and all of them are hard-working families, said Ken Jones of K & K Sanitation. According to the *Bracebridge Examiner*,

Jones told the councilors for the District Municipality of Muskoka, "One company just went out of business. There could be more."

Heather Becker, co-owner of B & B Sanitation, said the district's fees for dumping septage are the highest in Ontario: \$213 per 1,000 gallons. Other municipalities charge \$25 to \$60, she said.

Jones said pumpers from outside the area can now drive in, service clients, and haul septage to municipalities where they pay much lower fees.

Ireland

Poor maintenance of septic systems is not only common in the United States: About half of the septic systems inspected in 2016 failed to meet standards of the Ireland Environmental Protection Agency, reported *The Irish Independent*.

Local officials looked at 1,110 onsite systems last year and said 545 (or 49 percent) failed inspection. In 2015, about 45 percent of 1,097 tanks failed to pass inspection. The inspection program began in 2013 and focuses on areas where there is the greatest risk to public health and water resources.

The two most common reasons for inspection failures in 2015 were improper operation and maintenance of the system and a need for pumping.



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Would You Accept Eggs, Chickens and a Hog for Payment?

Iowa's Rob Brown has some interesting stories to tell about his customers, his favorite equipment, and his hopes for a more professional industry

Compiled by Betty Dageforde

In States Snapshot, we visit with a member of a state, provincial or national trade association in the decentralized wastewater industry. This time, we learn about a member of the Iowa Onsite Waste Water Association.



Rob Brown

Business: Brown Concrete & Backhoe Inc., Ely, Iowa
Age: 49
Years in the industry: 25

Association involvement:

Member for more than 20 years

Benefits of belonging to the association:

This association allows me to keep up to date on new products as well as any new technology. It is also helpful to stay current on any rule changes and stay on top of what direction the industry is moving. It also allows me the opportunity to discuss any questions or concerns with other contractors, engineers, the Department of Natural Resources, etc.

Biggest issue facing your association right now:

Displaying professionalism, staying knowledgeable and getting everyone educated.

Our crew includes:

My foreman, Curt Christopherson, who oversees and manages ongoing jobs, as well as seven full-time and eight part-time employees: Michele Brown, Justin Marks, Jim Woods, Marshall Thorp, Matt Whitters, Jeff Happel, Drew Pond, Heather Nekola, Helen Mihal, Brittany Brown, Ashley Johnson, Tom Brown Jr., Larry Brown, Kyle Purcell and Brooke Ralston

Typical day on the job:

I meet with customers throughout the day, making sure we are showing up promptly to jobs, accurately assessing problems, performing the work in a professional manner, and handling any other issues as they arise. I strive to do the best I can with accommodating all of the various needs of our customers.

Helping hands – indispensable crew member:

Christopherson has been with me since the day I started the business, and he plays a vital role in managing the various projects we take on. I would not be able to accomplish all that I do without him. I feel very strongly that all of our employees play an important role in our day-to-day operations, and we would not be in business without them.

The job I'll never forget:

The strangest thing that has happened was the time a customer asked if I would accept eggs, chickens and a hog for payment.

My favorite piece of equipment:

Our excavators, a Link-Belt 210 X2 and Caterpillar 316EL. I find these machines to be very impressive. They do all you ask of them, and I am continually surprised at their capability.

Most challenging site I've worked on:

We had a customer who was an engineer in need of a septic replacement. He insisted we use concrete tanks, so we had to use a 100-ton crane — which was set up in his driveway — to lift the concrete septic tanks over the top of

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his house to the backyard. We then had to use a conveyor belt to place the material in the sand filter bed in the backyard. This particular job required a lot of extra planning to complete the installation.

The craziest question I've been asked by a customer:

I had a customer call me after finding a worm in his toilet. He stated he had been to visit his doctor and had "extensive testing done" only to find out that he does not have worms. He was concerned that a worm had possibly come up through his septic and ended up in his toilet.

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

I would like to see the state of Iowa require all septic system installers be certified.

Best piece of small business advice I've heard:

To treat people the way you would like to be treated, and to be an honest, fair, and decent person. This was advice given to me by my dad.

If I wasn't working in the wastewater industry, I would:

Spend a lot more time with my wife and kids, use my fishing boat that I have not been able to use in 10 years, hunt more often than I do, and continue to do some of my farming (except in daylight rather than in the dark).

This is my outlook for the wastewater industry:

I believe there will be a very big upswing in the industry with all of the cider mills, wineries, distillers, bars, convenience stores, and other new businesses in rural areas. This may create some onsite system challenges. □

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

Send your suggestions to Jim Kneiszel at editor@onsiteinstaller.com.



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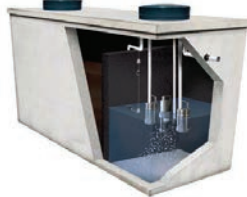
System Repair/ Drainfield Rejuvenation

By Craig Mandli

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The PuraSys sequencing batch reactor from Anua batches treatment in cycles, including aerobic and anaerobic steps, to clean water and reduce total nitrogen. It allows nitrification and denitrification to occur in the same chamber, saving space. The smart controls adjust aeration for varying flows, eliminating excessive air that can lead to system failure through sludge bulking. Flexible tank configurations include the retrofit of existing tanks. The system can reduce BOD5 and TSS to less than 10 mg/L and provide greater than 50 percent total nitrogen reduction, according to the manufacturer. It can be scaled up for commercial applications. 336/547-9338; www.anuainternational.com.



Aquaworx by Infiltrator Remediator

The Remediator from Aquaworx by Infiltrator is an easy-to-install septic system remediation technology that can rejuvenate failing septic drainfields with minimal landscape disruption. Inserted into an existing septic tank, the aerobic bacteria will progress to the drainfield to reduce biological clogging and allow the effluent to infiltrate the soil. It requires nominal operation and maintenance cost. It introduces oxygen into a bacterial-growth media column, allowing bacteria to thrive and consume organic matter. These bacteria combine with the oxygen-rich effluent in the tank and move to the drainfield, reducing the clogging layer and the associated odors and wet areas in the yard. 800/221-4436; www.infiltratorwater.com.

Bio-Microbics RetroFAST

The RetroFAST or RetroFITT-ee (energy-efficient version) unit from Bio-Microbics is designed as a simple upgrade to enhance a conventional septic system or renovate a biologically failed septic system. It installs directly in the existing tank to create an optimized treatment environment using submerged, fixed-film media for microbial growth with an energy-efficient aeration system. It constantly sends effluent that's rich in dissolved oxygen to the drainfield. Where sites and regulations allow, it can be used in new installations. It is designed to immediately deliver high levels of treatment to help ensure clogging layers never form. 800/753-3278; www.biomicrobics.com.



Norweco Singlair Green

The Singlair Green Advanced Treatment Unit from Norweco replaces failing septic systems with an advanced wastewater treatment solution. The easily installed tank helps reduce all household wastewater to a clear, odorless liquid in 24 hours. Treatment performance meets or exceeds the strictest state and county requirements and is certified to NSF Standards 40 and 245. It offers single-tank convenience and contains pretreatment, aeration, clarification, filtration, flow equalization, and optional disinfection and dechlorination. 800/667-9326; 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. 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 system can be maintained with an annual service call. Filters and textile media are accessible and cleanable, and control panels are touch-safe. No blower is needed for the passively vented system. An optional UV disinfection unit is available. 800/348-9843; www.orengo.com.



Premier Tech Aqua Ecoflo Biofilter

The Ecoflo Biofilter from Premier Tech Aqua is offered as a nitrogen removal unit using a new add-on kit. Integrating a pressurized flow divider to recirculate a fraction of the water back to the primary tank, all records and management of the dosing pump's cycles are monitored by a simplex control panel. It is available in ready-to-use rotomolded units or concrete units integrated into existing tanks made by local precasters. The 40 percent increased hydraulic load of the coco media has also allowed the development of the Ecoflo PACK, an all-in-one treatment system integrating the biofilter and primary tank delivered to sites in a single monobloc configuration, reducing both wait and installation time. 604/346-8199; www.premiertechaqua.com.

BIO/ENZYME ADDITIVES

Arcan Enterprises Septic-Scrub

Septic-Scrub chemical additive from Arcan Enterprises helps remove the sludge that builds up and sticks to the stone in a drainfield, pit or sand mound, helping rejuvenate the drainfield. According to the maker, it works in the first 24 hours after application. It can serve as part of a maintenance program. It works with all types of systems, is safe to handle and is environmentally friendly. 888/352-7226; www.arcan.com.



Bionetix International Fizzy-Tab

Fizzy-Tab from Bionetix International is a multipurpose natural cleaner that controls odor and helps maintain healthy grease traps and septic systems. It contains diverse micro-biological organisms designed to activate digestion of solid waste and reduce sludge buildup in the bottom of tanks. Naturally occurring bacteria and enzymes (cellulase, lipase, protease and amylase) in the tablets speed up the biodegradation of paper, oils, grease and other inert solid materials that settle on tank bottoms. They can be applied to toilets or directly to septic tanks to reduce sludge buildup, extend drain life, prevent drain blockage, reduce pumping frequency, and lower the risk of a leachfield failure while simultaneously improving drainfield percolation. They come as blue 22-gram tablets containing 5 billion CFU/gram. They replace chemical products and do not attack plastic or metal pipes. They should be added monthly to keep the septic or grease trap system healthy and functioning. 514/457-2914; www.bionetix-international.com.

Cape Cod Biochemical Company AfterShock

AfterShock soil absorption restorative from Cape Cod Biochemical Company is designed to restore drainage to clogged and sluggish drainfields and drainage structures by biologically digesting the solid material that normally clogs soil absorption areas. It contains naturally occurring, USDA-approved multistrain bacteria as well as a bacteria-friendly, time-released oxygen source that accelerates the bacterial metabolism. It is nonhazardous, is nontoxic, contains no U.S. Environmental Protection Agency Priority Pollutants, and is safe for the environment. It can be used in residential and commercial drainfields, cess-pools and seepage pits in conjunction with high-pressure waterjetting and soil-fracturing equipment. Its consortium of bacteria and oxidizer can be applied at the same time, eliminating the need to keep the system exposed for repeated site visits. 800/343-8007; www.septiconline.com.



Ecological Laboratories PRO-PUMP Bio-Remediation Super Kits

PRO-PUMP Bio-Remediation Super Kits from Ecological Laboratories are designed to recover flow in fouled and ponding absorption fields. PRO-PUMP/HC (High Count) is a special mixture of select, live vegetative bacteria that will break down and remove slow and difficult-to-degrade compounds. PRO-PUMP/SA (Sludge Away) is a natural humus soil science product that's designed as a biostimulant to speed the bioremediation process. PRO-PUMP/OX (Powered Oxygenator) is a calcium peroxide/hydroxide mix that's used as an oxygen source for the bacteria. The kits combine select cultures with enhancement technology that rapidly break down and degrade the organic compounds that reduce absorption flow recovery. 800/326-7867; www.propump.com.



Jet Inc. Bio Jet 7 Plus

Bio Jet 7 Plus from Jet Inc. is a nonhazardous and nontoxic bacterial aid used to degrade FOG, fatty acids, and lignin while lowering BOD, COD, and nitrates. When added to a system, its bacteria attack the grease and organic materials, converting them into liquid and then to carbon dioxide and water. Continuous use can help decrease odor, maintenance, and emergency blockages, according to the maker. 800/321-6960 www.jetincorp.com.



Scienco/FAST - a division of Bio-Microbics Inc. SciCHLOR

The SciCHLOR sodium hypochlorite generator system with multipass SciCELL electrochemical activation technology from Scienco/FAST - a division of Bio-Microbics Inc. can produce a supply of disinfectant solution. It is available in sizes of 10 to 60 pounds chlorine equivalent per day to provide a reliable method of safely producing liquid chlorine for medium to large on-site disinfection applications while surpassing operational efficiency performance requirements, according to the manufacturer. Connected to an incoming water source and with operating modes of batch, continuous, clean, setup and diagnostic, the brine solution multipasses through a low-voltage DC electrolytic cell to produce the sodium hypochlorite. When it reaches the low-level float setpoint, the system automatically restarts to replenish its water supply. If no solution is used, the system shuts down to save power. With an 800 ppm FAC (free available chlorine) sample taken from the generator, the solution killed 100 percent of the *Staphylococcus aureus* and *E. coli* organisms within 30 seconds, according to the maker. 866/652-4539; www.sciencofast.com.

JETTING



Amazing Machinery BossJet Max

The BossJet Max trailer-mounted jetter from Amazing Machinery has a diesel Kubota engine with electric start and a triplex plunger pump. It offers a 15-gallon diesel fuel tank and a 500-gallon water tank. There is an automatic tank overflow and low-water shut-off. It comes with a super-duty, 12-volt electric hose reel. Included are a six-piece nozzle kit, deluxe tongue-mounted toolbox, three hose reels, 50-foot wash-down wand and tips, 300 to 400 feet of 1/2-inch jetter hose, foot pedal, 2-inch rapid fill, and a 3-foot tiger tail. It is rated to clean up to 18-inch pipes and comes mounted on a 5- by 12-foot tandem-axle trailer with electric brakes, steel diamond-plate floor and DOT lighting. 800/504-7435; www.amazingmachinery.com.

American Jetter 58 Series Forklift Skid Jetter

The 58 Series Forklift Skid Jetter from American Jetter offers a complete jetter system that can be moved from one application to another with a forklift. It is based off of the 58 Series trailer jetter, but with a 4-foot-wide frame that slides easily between the fender wheels of most full-size trucks. Power is provided by a 32.5 or 37 hp Kohler gasoline engine with flows of 8.5 to 20 gpm to 4,000 psi. The rear electric-speed control reel provides precise cleaning speeds and easy access to the jet hose with optional hose guide. Low-water shut-off prevents pump damage in the 200-gallon tank. The optional 1-mile open-range wireless remote option allows for water on/off, engine shutdown and hose reel control. The heavy-duty square tubing frame and diamond-plate floor offer a rigid and durable work platform with mount hooks at all four corners. 866/944-3569; www.americanjetter.com.



Cam Spray RCJ Series

RCJ Series skid-mounted jettors from Cam Spray are offered in flows and pressures of 8 gpm at 3,500 psi and 7 gpm at 4,000 psi. A three-plunger industrial pump with pulse is powered by a 688 cc Honda engine. Its 200-foot jetter hose can be used to supply an optional 200DS4 portable reel cart with 200 feet of 3/8-inch jet hose. It comes with a 35-gallon buffer water tank with float control, powder-coated heavy tube frame, washdown gun and a four-nozzle set. It easily mounts in the side door of a cargo van, on a truck bed or inside a service truck. 800/648-5011; www.camspray.com.

General Pipe Cleaners, div of General Wire Spring Co., JM-2900 Jet-Set

The JM-2900 Jet-Set gas-powered water jet from General Pipe Cleaners, div of General Wire Spring Co., can quickly clear grease, sand and ice in 4- to 8-inch drainlines, according to the manufacturer. It is designed to be light and maneuverable, and it is driven by a 13 hp Honda engine connected directly to a 3,000 psi, 4 gpm triplex pump. Vibra-pulse helps the hose slide around tight bends in small lines and down long runs. A 200-foot-capacity hose reel with reel brake is mounted on a heavy-duty frame with two 10-inch flat-free foam-core tires. It has a thermal relief valve to protect the pump from heat damage, along with a backflow check valve and inlet filter. An optional spray wand is available. 800/245-6200; www.drainbrain.com.



RIDGID KJ-1350 Water Jetter

The RIDGID KJ-1350 Water Jetter propels a highly flexible hose through 1 1/4- to 4-inch lines, blasting through sludge, soap and grease blockages. As users pull the hose back, it power scrubs the line, flushing debris away and restoring drainlines to their free-flowing capacity. A working pressure of 1,350 psi and flow of 1.4 gpm provides fast, effective cleaning of lines. It comes with a 1.5 hp motor that draws a maximum of 14 amps, can run on most standard 115-volt circuits, and is CSA and UL standards approved. Users guide the hose into the drain while the thrust propels the hose down the line. Pulse action is designed to easily navigate difficult bends and traps. The pressure control valve allows for quick and easy pressure adjustment. The optional H-10 cart makes for easier transport. 800/769-7743; www.ridgid.com.

Suttner America Company jetting nozzles

Suttner America Company offers jetting nozzles from 1/8 up to 1 inch for cleaning drainpipes up to 28 inches in diameter. Non-rotating, rotating, milling or bullet styles are available. Sewer jetting hose from 1/8 to 1 1/4 inches and foot-actuated valves up to 7,300 psi are also available. 800/831-0660; www.suttner.com.



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Water Cannon Inc. - MWBE Poly Drive

The Poly Drive twin-cylinder pressure washer from Water Cannon Inc. - MWBE has a Honda GX690 engine and industrial-duty General Pump TSP Series pump, producing 6,000 psi of power for commercial and industrial cleaning applications. The units are also equipped with a Gates Poly Drive long-life belt system that is laser aligned. Standard accessories include a 50-foot pressure washer hose with quick couplers for continuous washing, four quick-connect spray tips, aluminum frame, safety belt guard, and a high-rated trigger gun and wand. 800/333-9274; www.watercannon.com. □

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System Repair/ Drainfield Rejuvenation

By Craig Mandli

Systems improve wastewater quality for ecologically and culturally sensitive community

Problem: A coastal retreat community in Hawaii was looking to remove large-capacity cesspools that serviced its vacation lodging facilities. The goal was to replace them with a technology that would provide improved water quality to protect the beaches and waterfront that are enjoyed by approximately 500,000 recreational users annually. The technology had to be sensitive to ecological constraints and stringent regulations while protecting and maintaining ancient Hawaiian burial sites and cultural resources.



Solution: Delta Environmental was commissioned to provide a treatment solution. The Whitewater DF60 system serves 26 cabins along the island coast. It is an aerobic treatment unit designed to reduce BOD, TSS and ammonia with a 600-gpd design flow capacity. Wastewater discharged from cabins flows into a 500-gallon pretreatment tank equipped with an effluent filter, then into the unit for biological treatment, and finally into a 500-gallon pump tank equipped with a Delta Ecofilter pump vault. The water is discharged into raised absorption beds.

Result: The unit allowed the community to upgrade its wastewater treatment systems to meet new standards of environmental and cultural stewardship. The effluent has satisfied local regulations. The absorption beds were re-vegetated with a variety of native Hawaiian plants that provide aesthetic and educational benefits to guests. **800/219-9183; www.deltaenvironmental.com.**

Advanced treatment system donated for Arizona home

Problem: A Yuma County, Arizona, resident applied and received a placement permit for a mobile home. It was discovered that the current septic system for the new home was an illegal cesspool and needed to be replaced. The resident did not have the funds to replace the cesspool.



Solution: The local sanitarian, Rick Stacks, reached out to local businesses for help in getting a legitimate septic system. They chose a three-bedroom-sized Advanced Enviro-Septic system donated by Presby Environmental, which treats the wastewater passively and disperses back into the earth without electricity.

Result: The mobile home now has a legal septic system that provides NSF 40 standard treatment. **800/473-5298; www.presbyenvironmental.com.**



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INDUSTRY NEWS

Bio-Microbics receives award

Bio-Microbics received the 2017 North American Integrated Water Treatment Technology Leadership Award from Frost & Sullivan. The award was presented on the basis of overcoming industry challenges and leveraging business impact with a commitment to innovation, creativity and technology incubation.



Bob Frost

Infiltrator Water Technologies partners with Habitat for Humanity

Infiltrator Water Technologies has partnered with Habitat for Humanity and will donate 50 septic systems to local Habitat for Humanity organizations throughout North America. Each donation will include a septic tank and drainfield product from the company. □

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PRODUCT NEWS

Clarus Environmental Model 5054 effluent pump

The Clarus Environmental Model 5054 is designed specifically for high head applications. The high-efficiency, semivortex impeller prevents any hang-ups that may occur. The Model 5054 produces a maximum flow of 70 gpm at 20 feet of TDH and can reach 114 feet at shut-off. The pump is powder-coated, has cast iron housing and passes 3/4-inch spherical solids. 800/928-7867; www.clarusenvironmental.com.



SJE-Rhombus NEX Series duplex control panels



The SJE-Rhombus NEX Series control panel product line includes single-phase duplex models designed to alternately control two 120-, 208- or 240-volt AC pumps in water and sewage applications. The alternating action equalizes pump wear. If an alarm condition occurs, a switch activates the audible and visual alarm system, providing overriding control should either pump fail. The compact design of the NEMA 4X indoor/outdoor-rated enclosure is ideal for residential water and wastewater applications. The panel is UL/cUL listed and is available with or without SJE SignalMaster control switches and elapsed time meters. 888/342-5753; www.sjerrhombus.com. □

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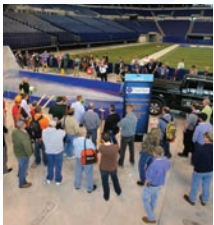
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Arkansas Onsite Wastewater Association;
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California Onsite Wastewater Association;
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Colorado Professionals in Onsite Wastewater;
www.cpow.net; 720/626-8989

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www.cowra-online.org;
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Delaware On-Site Wastewater Recycling Association;
www.dowra.org

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Florida Onsite Wastewater Association;
www.fowaonsite.com;
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Georgia Onsite Wastewater Association;
www.onsitewastewater.org;
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Onsite Wastewater Association of Idaho;
www.owaidaho.org;
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Onsite Wastewater Professionals of Illinois;
www.owpi.org

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Indiana Onsite Waste Water Professionals Association;
www.iowpa.org; 317/889-2382

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Iowa Onsite Waste Water Association;
www.iowwa.com; 515/225-1051

KANSAS

Kansas Small Flows Association;
www.ksfa.org; 913/594-1472

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Kentucky Onsite Wastewater Association;
www.kentuckyonsite.org;
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Maine Association of Site Evaluators;
www.maineese.com

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www.mapss.org

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Maryland Onsite Wastewater Professionals Association;
www.mowpa.org; 443/570-2029

MASSACHUSETTS

Yankee Onsite Wastewater Association;
www.maowp.org; 781/939-5710

MICHIGAN

Michigan Onsite Wastewater Recycling Association;
www.mowra.org

Michigan Septic Tank Association;
www.msta.biz; 989/808-8648

MINNESOTA

Minnesota Onsite Wastewater Association;
www.mowa-mn.com;
888/810-4178

MISSOURI

Missouri Smallflows Organization;
www.mosmallflows.org;
417/631-4027

NEBRASKA

Nebraska On-site Waste Water Association;
www.nowwa.org; 402/476-0162

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New Hampshire Association of Septage Haulers;
www.nhash.com; 603/831-8670

Granite State Designers and Installers Association;
www.gsdia.org; 603/228-1231

NEW MEXICO

Professional Onsite Wastewater Reuse Association of New Mexico;
www.powranm.org;
505/989-7676

NEW YORK

Long Island Liquid Waste Association, Inc.;
www.lilwa.org; 631/585-0448

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North Carolina Septic Tank Association;
www.ncsta.net; 336/416-3564

North Carolina Portable Toilet Group;
www.ncportabletoiletgroup.org;
252/249-1097

North Carolina Pumper Group;
www.ncpumpergroup.org;
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Pennsylvania Association of Sewage Enforcement Officers;
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Tennessee Onsite Wastewater Association;
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Wisconsin Onsite Water Recycling Association;
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NATIONAL

Water Environment Federation;
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Waste Water Nova Scotia;
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ONTARIO

Ontario Onsite Wastewater Association;
www.oowa.org; 855/905-6692

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www.oasisontario.on.ca; 877/202-0082

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Saskatchewan Onsite Wastewater Management Association;
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