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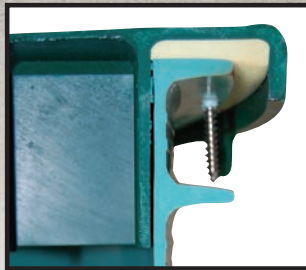
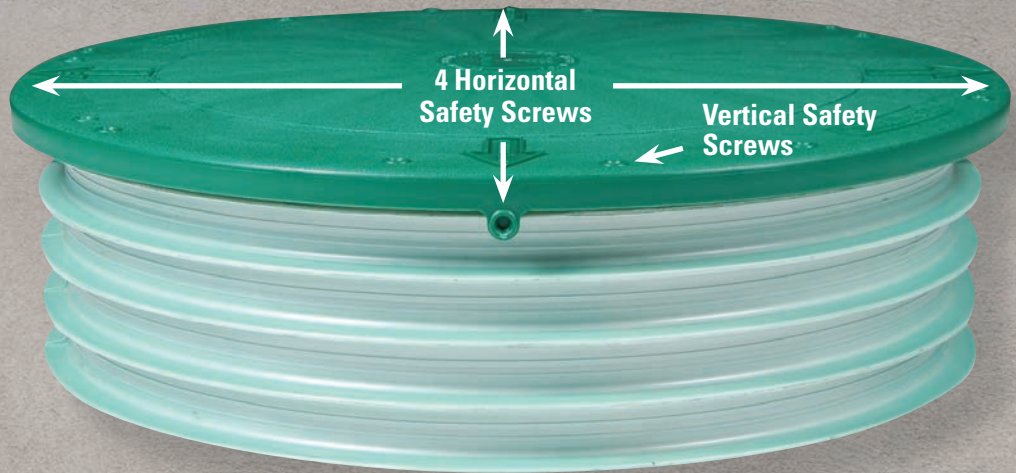
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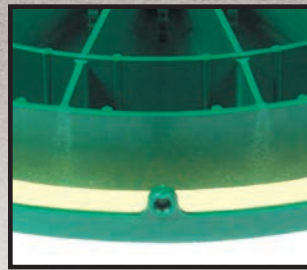
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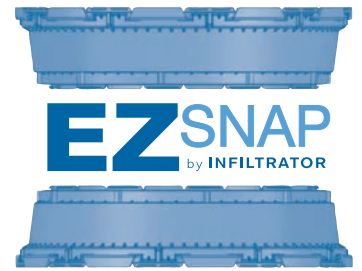
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INSTALLER PROFILE: My Success Formula By Scottie Dayton

ON THE COVER: Joe Procopio grew his lawn and landscaping startup into a profitable onsite system installing company, ready to tackle any challenge in his Rhode Island territory. Procopio is shown on a job site in Johnstown, Rhode Island (Photo by Stephanie Alvarez Ewens)

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Enjoy this issue!

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





Do Your Part to Keep Medications Out of Wastewater

Later this month you can participate in the National Prescription Drug Take Back Day and encourage your customers to stop flushing pills down the toilet

Recently an online *Onsite Installer* story sparked a debate about the impact medications — either excreted by patients or excess prescriptions flushed down the toilet — had on septic systems.

Writer Sara Heger, Ph.D., of the Onsite Sewage Treatment Program in the Water Resources Center of the University of Minnesota, shared some startling statistics about the rise in prescription medication usage. She reports that nearly half of Americans have used at least one prescription drug in the past 30 days, 23 percent used three or more over that period, and 12 percent used five or more.

She talks about the anecdotal impacts of these medications filtering through onsite systems and small amounts seeping into freshwater sources. She says certain prescription drugs have been shown to wreak havoc on the beneficial bacterial action of a septic tank and shares clues installers and pumpers can look for to determine if a customer has a toxic tank condition that needs attention.

A TOXIC PROBLEM?

A poster took Heger to task, challenging her to publish scientific evidence of the dangers of prescription medications passing through a decentralized wastewater system. “Without data, this article is useless,” the poster wrote. “What meds? What dosage? What effects? While anecdotal stories may be true, this is 2018. Articles like this seep into the culture and become policy.”

True to the harsh nature of social media responses, the writer’s toxic reply went on. The writer did have a point, and Heger allowed scientific research about the impact of medications on septic systems is lacking. However other writers chimed in to back up Heger, saying what installers and pumpers find in the field supports that medications are disruptive to wastewater treatment.

Even the U.S. Food and Drug Administration seems conflicted on its recommendations for disposing of millions of pounds of unused prescription medications. While the FDA and the U.S. Environmental Protection Agency say there are serious concerns about flushing prescription drugs into wastewater systems, its recommendation is that flushing some toxic drugs remains a better option over letting the drugs sit around where they may be accidentally ingested.

In its paper, *Risks Association With the Environmental Release of Pharmaceuticals on the U.S. Food and Drug Administration Flush List*, the agency talks about evaluation of 15 medicines it recommends flushing when there isn’t safer disposal method available. It states:

“FDA concluded that these medicines present negligible risk to the environment, although some additional data would be helpful for confirming this finding. FDA believes that the known risk of harm, including death to humans from accidental exposure to certain medicines, especially potent opioid medicines, far outweighs any potential risk to humans or the environment from flushing these medicines.”

Information on the FDA flush list can be found at www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/ensuringSAFEuseofmedicine/safedisposalofmedicines/ucm337803.pdf.

TURN IT POSITIVE

I’d like to move beyond the social media sniping and turn the complaint into something positive for our *Installer* community.

Let’s start by recognizing we need more valuable research on the impact of medicines in septic systems *and* the environment beyond the dripline. Let’s also recognize many wastewater professionals are presenting anecdotal evidence that onsite systems are threatened when users are under heavy medication to battle dreaded illness such as cancer, multiple sclerosis and Parkinson’s disease. All of these are scourges for stricken people. . . . And their situations are made even worse when their onsite systems show signs of failure.

The point is that we can make a difference for onsite customers and the environment by attacking the problem of fast and efficient disposal of unused medications. And I have a personal story that may help start a few conversations.

Two years ago I sadly lost my mother at age 90 to a combination of terrible illnesses including breast cancer and heart disease. As doctors treated her to slow the cancer and treat her symptoms, she was prescribed dozens of medications, including pill-form chemotherapy, blood thinners, and pain pills. After she passed, I started collecting the bottles of unconsumed pills, which literally filled a plastic kitchen garbage bag.

About that same time, as a city council official I was involved in the approval of a local collection of prescription medicines as part of a National Prescription Drug Take Back Day through the Drug Enforcement Administration. Our police chief wanted to set up a collection site to securely hold unused prescription drugs until they could be taken for incineration, thought to be the most effective method of disposal.

By taking that big bag of pill bottles to the police department, I was able to prevent them from getting into the wrong hands, going to the landfill, or getting flushed into the wastewater stream. I felt like I was doing something good for the environment and my neighbors. And I think installers can share in that feeling and help their customers at the same time.

TAKE BACK DAY

The DEA's next Prescription Drug Take Back Day is later this month, Oct. 27, where medications that might otherwise be flushed down the toilet can be taken to about 6,000 participating collection sites across the country. Earlier this year, the last Take Back Day set a record by collecting nearly 475 tons of unused prescription drugs. Since the program started in 2010, the DEA has collected almost 5,000 tons for safe disposal.

Some concerned groups are already taking part, such as the Tip of the Mitt Watershed Council in Michigan, which promotes working with the Prescription and Over-the-Counter Drug Drop-off Program, or POD.

We need more valuable research on the impact of medicines in septic systems and the environment beyond the dripline.

Let's also recognize many wastewater professionals are presenting anecdotal evidence that onsite systems are threatened when users are under heavy medication.

"Our water supplies are growing evermore contaminated with medications. Flushing medicines down the toilet or putting them in the garbage can contaminate our water resources," Jennifer McKay, the council policy director, says in a recent news story. "Most of these chemicals pass through treatment plants or septic systems. Sewage treatment plants and septic systems are not designed to treat all the substances contained in medications."

McKay asserted that chemicals accumulate in rivers, lakes, and groundwater, potentially threatening wildlife and making it into drinking water.

So what can we in the onsite installing community do to help?

Join forces with local law enforcement officials

Check with the police in your area and see if they are involved in the DEA Prescription Drug Take Back Program. If they are, look for ways to help the effort. If they're not, offer to help spearhead a local collection. Support from individuals and groups is often needed to get these programs off the ground. There may be necessary investments in secure drop boxes or additional labor to run the collections. Your company could offer a financial contribution, or you could donate your time to raise awareness of the importance of these programs in the community.

Stress "no flush" with your customers

As part of your system maintenance program, sit down with customers and share the many reasons they should dispose of prescription drugs properly. Talk to customers about their situations and be mindful of suggestions if they are taking a lot of medications for illnesses. Pay attention to conditions you find that would indicate a toxic onsite system.

Put together a brochure with information from the FDA and the DEA and give it to your customers. Pass along this information at septic socials or other

consumer education events. Meet with your local health department officers and offer to work with them on an education campaign. Address the issue through blogs on your company website and look for other outreach opportunities.

PART OF THE SOLUTION

Promoting safe collection of unused medications would be a winning cause for installers, your customers, and the greater community where you live. Being at the forefront of environmental awareness, you will become a more trusted provider of wastewater services. Sharing what you know about medications and how they can impact onsite systems will help your customers maintain their systems properly. And working with local officials reflects well on your focus on both environmental sustainability and public safety. □

DROP US A LINE

Have a comment about an article you've seen in *Onsite Installer*? An experience from a job that you'd like to share? *Onsite Installer* would love to hear from you. Email comments and photos to editor@onsiteinstaller.com.

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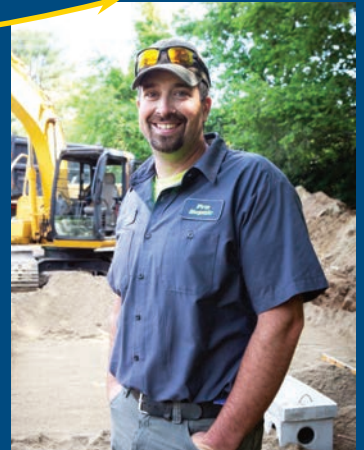
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BUILDING A REPUTATION

Customer Relations

Cover star Joe Procopio believes there's no advertising ploy as effective as the recommendation of a satisfied customer. Read this exclusive online story to see how he goes above and beyond to provide service that increases word-of-mouth referrals. onsiteinstaller.com/featured



A PRESSING ISSUE

Soil Compaction Warnings

Homeowners can adversely affect the health of their septic system if they don't understand the concerns and causes of compacted soil. Any soil treatment area needs healthy soil to function properly. This online article spells out the effects of soil compaction and the causes to tell customers to avoid. onsiteinstaller.com/featured

Approved!



Overheard Online

“Having personal and business finances together makes it difficult to establish business credit because a bank or lending agency can't easily isolate business income, which is the number a lender needs when assessing whether or not to approve a business loan.”

– Give Your Business Some Credit
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ON THE LEVEL

Trench Concerns

Continuing with his series on drainfield troubleshooting, expert Jim Anderson explains what to do when surfacing occurs at the end of one or more trenches and how to identify the cause of the problem. onsiteinstaller.com/featured



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MY SUCCESS FORMULA

An appetite for tough installing jobs, a vision for diversified services and a commitment to working smart and safe have steered Joe Procopio toward his small-business goals

By Scottie Dayton



← John Sgambato, left, and Joe Procopio are shown on the job in Johnston, Rhode Island. (Photos by Stephanie Alvarez Ewens)

As a hardworking 18-year-old entrepreneur, Joe Procopio proved success is built not so much on the equipment you have on hand, but on how you use it. In 2003, he opened J. Procopio Landscaping with a pickup truck and a lawn mower. While he grew the one-man operation, he also worked nights driving an ambulance and earning his emergency medical technician certificate.

By 2011, the demand for backhoe service and light excavation was sufficient enough for Procopio to leave the medical field and open Land Works in Scituate, Rhode Island. “I’ve never looked back,” he says. “We recently subdivided the company into ProSeptic, because 90 percent of our work is onsite repairs, and Joe’s Johns to provide portable restrooms.”

The state’s 2007 Cesspool Act keeps the service board full for Procopio, full-time employee John Sgambato, and occasional part-time help. “Whenever a property sells, either before the sale or within a year of it, the cesspool must be upgraded to an onsite system,” says Procopio, a Class 1 designer and installer. “It sounds easy on paper. Reality is a different story.”

CESSPOOL ISSUES

Approximately 150,000 households, or one-third of the state’s population, have onsite systems. Another 70,000 homes have cesspools, many within 200 feet of wells or bodies of water. It’s not unusual for Procopio to find more than one cesspool on lots that are often long and narrow. Such days usually begin with a call about water bubbling up in the yard.

In one case, Sgambato pumped the cesspool, but effluent kept flowing in. “The owner said it was connected to another cesspool, which we found and pumped, and the same thing happened,” Procopio says. “Sure enough, there was a third. As each cesspool failed, they added another.”

Because the cost of connecting to the sewer was unaffordable, Procopio scheduled annual pumpouts. “We see this frequently with the elderly, who are unconcerned because the cesspool backs up only once or twice a year,” he says. “However, these people usually have wells. We explain that they are exposing themselves to the risk of drinking what was just flushed down the toilet, but it is met with resistance.” Pumpers complete a manifest but are not required to submit anything to the state.



ProSeptic

Location: Scituate, Rhode Island

Owners: Joe Procopio

Founded: 2003

Employees: 2

Service area: Providence County

Specialties: Onsite installations, replacements and inspections; septic pumping, site preparation, portable restrooms

Website: www.prosepticri.com



“However, these people usually have wells. We explain that they are exposing themselves to the risk of drinking what was just flushed down the toilet, but it is met with resistance.”

Joe Procopio

When the inevitable replacement looms, homeowners often worry about what their yards will look like afterward. Procopio’s expertise as a landscaper leaves yards hydroseeded and frequently looking better than when he arrived.

“I don’t want the job if customers refuse loam and seed,” he says. “If we leave a mess, any passerby will have seen our trucks there and think this is the type of work we do.” Procopio even cleans mud off the road with a broom or blower before leaving sites.

PLAN AHEAD

Constrictive lots aren’t his only headache. In a classic case of putting the cart ahead of the horse, contractors paved the driveway of a home before the replacement onsite system was installed. The property had a cesspool serving the kitchen and another for the bathroom. “We weren’t allowed to damage the driveway, new patio or a Japanese maple tree,” Procopio says.

First, the rubber-tracked Bobcat E63 excavator hit boulders too large for the machine to move, and the John Deere 120C steel-tracked excavator was too large for the site. Procopio rented an Elco/Darda rock splitter from Sunbelt Rentals, then he and Sgambato drilled and split the boulders until they were small enough to stockpile. “The hard granite was a beautiful shade of pink and gray,” Procopio says.

An expensive dwarf Japanese maple tree grew on the edge of the system’s footprint. “Avoiding the driveway and concrete patio and meeting the 10-foot setback from the tree made the installation tricky,” Procopio says. They installed a 1,000-gallon concrete septic tank (United Concrete Products) with gravity flow to an In-Drain B43 GSF geotextile sand filter (Eljen). Afterward, the owner asked Procopio to arrange the split granite around the perimeter of the Japanese garden.

A TIGHT SQUEEZE

Built-out lots often require replacement systems with secondary treatment to reduce the system footprint. Procopio’s go-to combination is AX20 AdvanTex aerobic treatment units with Biotube pump vaults (Orenco Systems) discharging to a bottomless sand filter. A typical example was a five-bedroom summer home with a large cesspool near the Atlantic Ocean. Two fences, pine trees on the property line, and the house with deck constricted the work area.

The 13- by 7- by 7-foot-tall 2,500-gallon H-20 traffic-rated precast septic

◀ Joe Procopio, in the foreground, delivers Eljen Bio-Matt units to a work site while employee John Sgambato looks on.

▶ Joe Procopio operates a John Deere 120C excavator on a job site.

tank with risers fit between the deck and fence, while the two AX20 units were in a box off to the side. “Often the only way to make a system like this fit the site is to stack the ATUs on top of the septic tank, but we didn’t have enough depth for that,” Procopio says. “Just the tank excavation was already below the water table at 16 feet.” The men built a straw wattle filter and dewatered the hole as the delivery truck driver set the tank. The truck barely fit on the driveway or in the yard.

Sand was delivered in the company’s Mack RD688S 10-wheel dump truck with 18-cubic-yard Bibeau Hardox box. Using pressure-treated 6-by-6-inch landscape timbers, the men built a box for the ATUs and a 35-by-7-foot box for the sand filter. “Because of the high water table, we had 6 inches of filter in the ground and 23 inches above grade,” Procopio says. “By the time we were done, there was just enough room to swing the excavator around to get out.”



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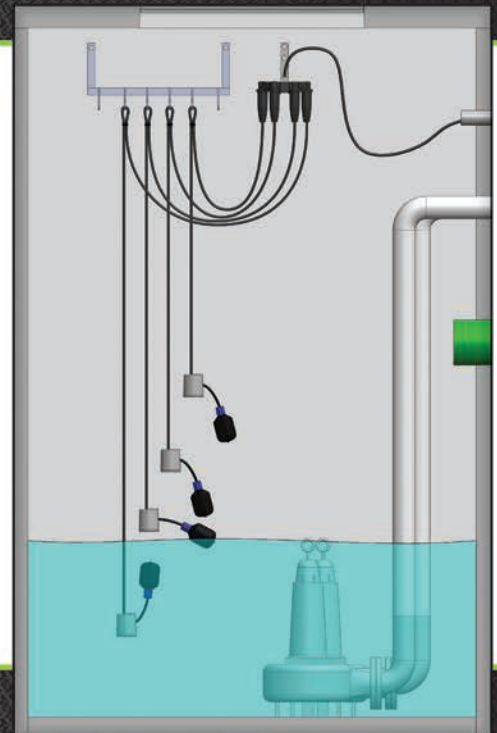
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LOVES A CHALLENGE

Even new constructions don't guarantee an easy installation. One job became a horror show for Procopio. It began when the general contractor built the house from plans that differed from the onsite engineer's plans. When Procopio arrived, he noticed the 1,500-gallon, two-compartment precast tank would sit under the home's front concrete steps, the tank was too close to the sand filter box, and there wasn't enough room for the components.

"We never want to leave customers without a bathroom if we run into a snag and the repair takes longer than anticipated."

Joe Procopio

"I called the engineer's staff, twice, pointed out the discrepancies, and was told to 'do it as we drew it,'" Procopio recalls. "At some point the engineer reviewed the situation, but not before we set the tank. We probably lost two days on that job while the engineer redrew the plans." The revisions switched the standard septic tank to an H-20 traffic-rated tank and relocated it under the driveway.

Despite the occasional toss-and-turn nights, Procopio thrives on challenges — the trickier the better. His goal is to become the premiere full-service septic company in the state. To that end, he refurbished a Mack RB688S 10-wheel vacuum truck with 3,300-gallon carbon steel tank (Andert), 50-gallon freshwater tank, and Jurop/Chandler R260 vacuum pump last year. He also installed a Vacu-Fresh vacuum pump exhaust deodorizing system (Walex Products) that passes exhaust from the pump through a liquid deodorizer. A dedicated exhaust stack vents vapors 7 feet above the ground.

"I'd been using a local pumper until I realized it was silly," Procopio says. "Owning a truck enables us to respond rapidly to emergency calls and be the first company on scene to solve the homeowner's problems. Furthermore, repairs are faster because I no longer have to wait for the pumper to arrive."

The business pumped 120,000 gallons in 2017, off-loading at the Lincoln Septage Receiving Station or Veolia Water Technologies Cranston Water Pollution Control Facility.

continued >>



▼ Joe Procopio fits a pipe into a distribution box at a work site, with a helping hand from John Sgambato.

STAY CLEAN, WORK CLEAN

Joe Procopio considers laundering family clothes with work clothes soiled by human waste unacceptable. "No spouse or partner should have to deal with it," he says.

Procopio hired UniFirst to supply and launder coveralls, pants, shirts and jackets. "Everyone looks more professional in uniforms," he says. Procopio and full-time employee John Sgambato change clothes daily. Their work boots, hard hats and uniforms are on a rack at the shop.

Procopio also adopted safety procedures he learned as a former emergency medical technician. He sanitizes tools and trucks with VitalOxide (Vital Solutions), a hospital-grade disinfectant. "Every truck carries a spray bottle of it," he says. "We spray the dashboards, and John pressure-washes the trucks with hot water. Inside and outside, they are clean and safe."

Besides uniforms and hard hats, Procopio buys high-visibility vests, different types of gloves, medical gloves to wear beneath them, and safety glasses by the dozen. "A pair is \$2 wholesale," he says. "I'd rather have my guys wear disposable glasses than to have something fly into their eyes."

Procopio leads by example, teaching working clean and safe. "No one goes down 10 feet without a trench box," he says. "I've worked on jobs where we were told to do it and I refused until they brought the box."

"Safety equipment is cheaper than someone being injured. I don't want to live with the knowledge that one of my guys lost his life or body parts due to something preventable."

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◀ John Sgambato delivers a load of pipe for a septic system install.

ADDING SERVICES

To expand into jetting, locating, and inspecting, Procopio turned a pressure washer with 13 hp Honda engine and 4 gpm pump into a jetter, and he purchased a Gen-Eye camera (General Pipe Cleaners/General Wire Spring). Then the next expansion was a fluke.

“Nothing is more unprofessional than men relieving themselves behind sheds or tramping into the customer’s bathroom, so I bought a couple of PolyJohns,” Procopio says. Then friends asked him to buy some units for their job sites. Ray Luden, Procopio’s PolyJohn representative, recommended purchasing more units than Procopio thought he’d need. “Last year, we ordered 10 PJN3 portable restrooms, then four PJP3s, and a wash sink and opened Joe’s Johns,” Procopio says.

To service the portable restrooms, he repurposed a Ford F-350 by adding a flatbed, 300-gallon waste and 150-gallon freshwater aluminum slide-in tank (Robinson Vacuum Tanks) and Masport pump. Sgambato drops a unit at each onsite job site. “We never want to leave customers without a bathroom if we run into a snag and the repair takes longer than anticipated,” Procopio says.

Nowhere was this professionalism appreciated more than at an art camp held at a customer’s home. On the day of the repair, almost a dozen youngsters and some parents were on the premises. Told they couldn’t flush the toilet for four hours, an adult asked Procopio if the portable restroom was clean. “Not only was it clean, it was brand new,” he recalls.

WHAT’S NEXT?

To keep track of the portable restrooms and pumping, Procopio installed ServiceCore business software in 2017. “Our receipts have a mini inspection checklist on the bottom for effluent filter, tank material, riser to grade, etc.,” he says. “Having this information in the computer enables us to remind customers when pumpouts are due. The service has been well-received.”

Procopio recently rented a new shop and shares a 2,500-square-foot bay with David Walch, owner of D.J. Landscaping and Procopio’s subcontractor. Within the next 10 years, Procopio plans to have five or six full-time employees, two or three vacuum trucks, and one full-time portable restroom truck servicing 200 to 300 units. However, growth must never exceed his capabilities to maintain a family company or restrict his time in the field.

“The way I see it, the average age of most septic installers and pumpers around here is late 40s to 50s,” he says. “Some are even older. When they retire, I want to be in a position to fill the void.” ◻



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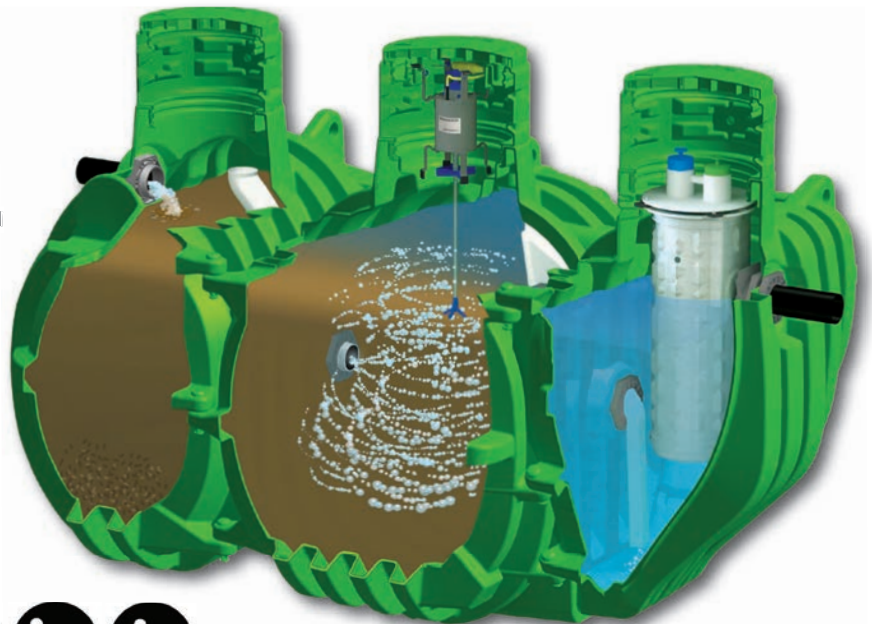


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Slipshod Soil Evaluation Can Lead to a Slippery Slope

Keeping your crew safe on every excavation site requires careful planning before digging that hole

By Jim Anderson and David Gustafson

In a recent article, we addressed a picture sent in by an installer where he or an employee was shown in a trench excavation where the sidewalls extended above his head without any visible protection such as shoring, sloping or means of escape (ladder). The rationale of the installer was that the soils were cohesive enough that he did not have to provide protection; so we reviewed the Occupational Safety and Health Administration soil classification system and the required sloping protections for the different classifications.

About the time the column was slated to run, we read about a sewer crew working in an unprotected trench that collapsed, killing all three of them. These types of accidents are totally preventable with a little understanding about what can go wrong when excavating in soils and planning to avoid the problems.

When we in the industry talk about soil, we refer to naturally occurring material that is made up of some mixture of sand, silt and clay particles. We use the Department of Agriculture classification system to describe these mixtures because it best reflects the ability of the soil to accept water. OSHA places these materials into three classes instead of 12 based on their strength and cohesiveness. Soil conditions can vary from one site to the next and even within a site. Soil may be loose or partially cemented, organic or inorganic. These characteristics need to be evaluated at each site before excavation begins.

Depending on moisture content, 1 cubic foot of soil can weigh 110 to 140 pounds.

When soil falls on you, if you are even partially buried it is difficult to get yourself or someone else out!

MOST COMMON FAILURES

Soil failure is defined as the collapse of part or all of an excavation wall. The most common soil failure is typically described as an unexpected settlement, or cave-in, of an excavation. Soil sliding is the most common factor leading to soil failure. Sliding soil failure can occur in all types of excavations including sloped trenches, but when safety precautions are taken, employees can be protected. This is one reason why OSHA looks for the

“competent” person on site who makes sure safety precautions are in place.

Soil stresses and deformations can occur in an open cut or trench. For example, increases or decreases in moisture content can adversely affect the stability of a trench or excavation. Look for tension cracks in the soil away from the trench edge. These cracks usually form at a horizontal distance of one-half to three-quarters times the depth of the trench, measured from the top of the vertical face of the trench. Soil from between these cracks and the edge of the excavation slides into the trench void. Similarly, the soil at the top edge of the trench along the tension crack line can topple into excavation.

The installer should look for these cracks while the excavation is proceeding. It is part of the reason why spoil piles from the excavation need to be more than 2 feet away from the edge of the trench. It is hard to see the cracks if they are covered by the spoil material. The other reason, of course, is to make sure the spoil material does not fall back into the trench.

In some cases, an unsupported excavation can create an unbalanced stress in the soil. This causes subsidence at the surface and bulging of the vertical face of the trench. If uncorrected, this condition can cause face failure and entrapment of workers in the trench. Think of it as the trench wall blowing out due to the stress.

There are a few additional conditions that can occur in onsite work, but they are less common given our typical excavation depths. They are bottom-heaving and boiling. Bottom-heaving is caused by downward pressure created by the weight of adjoining soil. This pressure causes a bulge in the bottom of the excavation. Heaving can occur even when shoring has been properly installed. If this condition is observed, the trench should be vacated until additional safety measures such as sloping are in place.

SOIL IS HEAVY

Boiling occurs where the excavation extends below a water table and water “boils” upward into the bottom of the excavation, creating a very unstable condition even with shoring. Since we certainly should keep our systems above the water table, this should not be a condition that we would see a lot. Although it could happen where tanks or parts of the piping need to be installed at elevations at or near water table levels.

A sobering thought to remember: Soil is heavy! Depending on moisture content, 1 cubic foot of soil can weigh 110 to 140 pounds. When soil falls on you, if you are even partially buried, it is difficult to get yourself or someone else out! In addition, if you are buried, it is impossible to breath; time available to rescue someone is very short.

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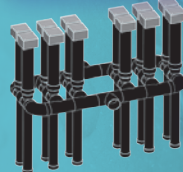


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A safe slope can be defined as the maximum angle of the edge wall or bank of an excavation at which sliding will not occur. The unique mixtures of the different types of soil (sand, clay, silt and rock) necessitate different safe slopes for every excavation site. This is why OSHA developed the three-soil-type classification system with different sloping criteria.

Other complicating factors can result in sliding soil failures. During an excavation, visibly different layers of soil may be uncovered. For instance, each of those layers may call for different safe slopes. It is essential to plan your excavation around the most gradual (rather than steepest) safe slope for different soil types and layers encountered during the excavation.

We will explore other complicating factors and soil conditions in next month's column. □

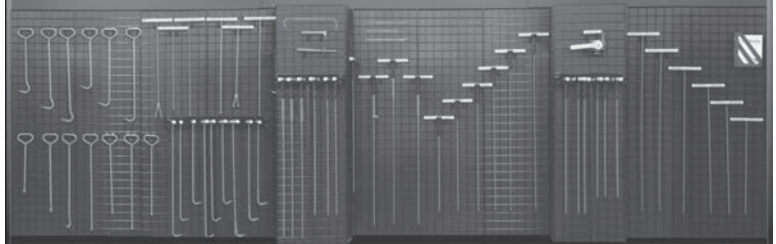


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▼ The flooded septic tank, the result of a management company pumping the contents of a flooded basement down the septic clean-out. (Photos courtesy of Mark Green)

Excessive Rain and Unseen Obstacles Create a Nightmare Project

A two-stage pretreatment leaching system provides effective treatment in a small footprint on a 2-1 slope for a Connecticut homeowner

By Scottie Dayton

Buying a four-bedroom home with a flooded basement heightened the risk factor for a house flipper in Southbury, Connecticut.

A management company hired to extract the standing water opened the septic clean-out and pumped in 26,000 gallons, destroying the 1,000 gpd system with stone-and-pipe drainfield. That day, the flipper sold the house, unaware of the mishap.

The flipper hired Mark Lancor, P.E., owner of DYMAR in Southbury, to design a replacement. Lancor hired Mark Green, owner of Green Construction Management in Waterbury, to dig the test holes and install the system before the home sale closing date.

“The house sits in a depression at the back of the lot, and everything drains down a 2-1 slope to it,” Green says. “I dug two 3-foot-deep pits 30 feet apart and on either side of a mature white oak on top of the hill, and a third near the road. It was mid-September and we were in a drought. The soils looked good.”

Like the topography, everything went downhill from there. Hidden obstructions required multiple revisions to the design incorporating a Mantis leaching system with low-pressure dosing. During the last week of October, two massive rainstorms saturated the county. “I was so frustrated,” Green says. “I was taking one step forward and sliding back two.”

SITE CONDITIONS

Soils are loam and sandy loam with a percolation rate of 1 inch per 12 minutes. The 1.41-acre lot rises from 27 to 45 degrees where the hill meets the road.

SYSTEM COMPONENTS

Lancor designed the system to handle 1,000 gpd. Major components are:

- Existing 1,250-gallon dual-compartment concrete septic tank
- 1,000-gallon dose tank (United Concrete Products) with 1/2 hp EH522DS effluent pump from Barnes Pumps (Crane Pumps & Systems)
- DB-6 concrete distribution box (United Concrete Products) with speed levelers (TUF-TITE)
- 17 Mantis 536-8 treatment modules (Eljen).

SYSTEM OPERATION

Wastewater flows through the house lateral to the septic tank, then to the dose tank. The on-demand pump cycle sends 173 gallons at 40 gpm 55 feet through the 1.5-inch PVC force main to the distribution box feeding a 4-foot-wide trench on either side. The 45-foot-long trench No. 1 has nine 60- by 36- by 18-inch-high treatment modules; the 40-foot-long trench No. 2 has eight units.



◀◀ United Concrete Products delivers the distribution box and 17 Mantis 536-8 treatment modules (Eljen).

⚡ The oak was growing above a piece of ledge.

▶▶ Mark Green uses a Volvo EC35C rubber-tracked mini-excavator to dig the 4-foot-wide trench for the Mantis treatment modules.



In the distribution box, 4-inch pipes connect to the factory-installed pipe near the top of the 15-gallon capacity modules. Holes in the pipe are at 5, 7, and 12 o'clock. Each unit has eight vertical Bio-Matt filters 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 used a rented 55 XA self-propelled lift (Haulotte North America) to cut down the oak and smaller trees in the drainfield area. While clearing the stumps, he hit ledge. "The oak had been growing right out of the middle of it," Green says. "The rock was too dense for the jackhammer on my rubber-tracked Volvo MCT125C skid-steer loader to break."

Lancor moved the drainfield's location 5 feet to the east, but Green hit ledge while digging the test holes. "The Pomperaug District Department of Health and the homeowner were very understanding of our difficulties," Green says. "The homeowner especially, since we cut down his trees when we didn't have to, and it cost him \$3,000."

On the third try, Green and Lancor found suitable soils and no ledge, but town officials wanted further confirmation. Green returned and dug four more holes without hitting ledge. The closing date was eight days away.

System Profile

- Location:** Southbury, Connecticut
- Facility served:** Four-bedroom home
- Designer:** Mark Lancor, DYMAR, Southbury
- Installer:** Mark Green, Green Construction Management, Waterbury
- System repair:** Mantis leaching system with low-pressure dosing
- Hydraulic capacity:** 1,000 gpd

The health department quickly approved the new design, and Green raced to scarify the drainfield area as H.L. Bennett Jr. Septic Systems pumped the septic tank and liquid draining back from the absorption bed. Green's father, Wayne Green, directed the sand and fill trucks from Independent Crushing, handled the tickets, and shot elevations. "The site was too small for more than two people to work, so it was just Dad and I," Green says.

SYSTEM PROFILE

- » Wayne Green supervises setting the pump tank, coated inside and out to prevent inflow.
- » Wiring the pump tank's electrical connections.



“The (department of health) and the homeowner were very understanding of our difficulties. The homeowner especially, since we cut down his trees when we didn't have to, and it cost him \$3,000.”

Mark Green

Trench No. 2 sloped toward the house. “I explained to the owner that nothing we built on a 27-degree angle would hold,” Green says. The owner gave permission to order more clean fill, and Green tapered it into the slope, achieving a 3-1 ratio.

Meanwhile, Lancor inspected and pressure-tested the septic tank. “The tank was sound, but the outlet had holes, the lid wasn't sealed, and there were no risers,” he says. “Inflow had to be significant.”

Using the skid-steer, Green shuttled 200 tons of septic sand and 350 tons of clean fill to the site, then he dug the trenches with a Volvo EC35C rubber-tracked mini-excavator. Installing the treatment modules was straightforward but left a gully between trench No. 1 and the oak tree's former location, both on the same elevation. Green filled the depression and graded the soil into the hill.

WHEN IT RAINS, IT POURS

The following Tuesday, 4 to 6 inches of rain fell. “It settled the sand and nothing washed out, so we were good with that,” Green says. “When the property dried sufficiently to support the excavator, I dug the hole for the pump tank and a 50-foot-long trench to the house for the 1-inch Schedule 40 electrical conduit.” All structures were bedded on 6 inches of 3/4 inch crushed stone.

Per Lancor's specifications and to prevent inflow, the tank arrived with 15 mils of Epoxy Waterproofer (Chargar) on the inside and 15 mils of 220AF

Cold-Process Fibered Asphalt Roof Coating (Karnak) on the outside. Green hooked up the tank's electrical connections and the inlet and outlet pipes before laying the conduit.

"The electrical inspector wanted to see the line, so we went home Friday night without backfilling the excavations," Green says. "That made me nervous because another storm was in the forecast."

Over the weekend, 6 inches of rain fell, flooding the excavations and submerging the front yard; however, the drainfield faired well. Green spent half a day dewatering the tank hole and trench using a 2-inch 1 hp Multiquip pump. "I was discharging to a swale with a slow percolation rate," he says. "In addition, clear stormwater kept draining back from the old absorption bed."

Meanwhile, Jeff Carlascio, owner of Carlascio Electric, arrived to hook up the alarm disconnect switch at the house and found the electrical box full. After purchasing a second panel, he spent half a day rewiring the boxes.

After the onsite and electrical inspections, Green installed a PL-122 Polylok effluent filter in the septic tank, then used concrete blocks and mortar to lay up square risers to grade. He topped them with cast iron manhole frames and lids.

Green ordered more fill and topsoil to landscape the front yard, but as soon as a truck left the driveway, the tires spun out on the remaining waterlogged grass. One tri-axle sank in the mud.

"The driver dumped his load where he was and called an empty truck to pull him out," Green says. "I shuttled tons of material with the skid-steer. The extra work made us miss the closing date and stretched the actual installation to 10 days instead of three to four."

Before the Greens departed, Randy Olmstead of All Green Hydroseed sprayed a custom grass seed mix over the topsoil to reduce erosion.

MAINTENANCE

Green recommended the septic tank be pumped every two to three years. □

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Michigan Begins Legislative Journey to a Statewide Sanitary Code

By David Steinkraus

After a few months of speculation, the proposal to give Michigan a statewide sanitary code is now in the Legislature. House bills 5752 and 5753 would establish rules for onsite systems and require the creation of state rules for them. According to an analysis prepared by the House Fiscal Agency, the bills would:

- Require the state Department of Environmental Quality to develop a statewide code that would set standards for siting and design of onsite systems, for effluent, for inspection and maintenance of onsite systems, and for the qualifications and continuing education of people managing onsite systems, among other things.
- Allow local health departments to administer the code.
- Forbid local governments from adopting point-of-sale ordinances that require an inspection of an onsite system when a property is sold.
- Require the owner of a septic tank to have it assessed at least every 10 years by a local health department or a registered inspector or service provider.
- Require alternative systems to be inspected by the state, local health department, or registered inspector at least once every five years.
- Require all installations after Jan. 1, 2020 to be done with a permit from the state or local health department and using only products that have been registered with the DEQ for use in Michigan.
- Establish a technical advisory committee of 16 people, including three from the onsite industry, to advise the DEQ on its rules.

People inspecting septic tanks would have to document their inspections and file reports with the local health department or DEQ. They would also be required to charge a \$25 state fee in addition to their own billing, and this money would be channeled to a fund that would also draw money from the fees people would pay to become licensed inspectors and fees charged to companies to register their products for use in the state. Money in the fund would be used to administer the code and provide grants to health departments for their work in administering the code.

The bills were sponsored by Rep. Jim Lower, R-Cedar Lake, who introduced 5752, and Rep. Abdullah Hammoud, D-Dearborn, who introduced 5753. WasteWater Education, a nonprofit group based in Traverse City, Michigan, expressed concerns about the bills early on because little was known about the process of drafting them and who was involved in drafting.

Advocates have been asking for a statewide code for some time. Joan Rose, who directs the Center for Advancing Microbial Risk Assessment and Center for Water Sciences at Michigan State University, pointed out in 2017 that counties pass point-of-sale ordinances because the state's rivers and streams

are increasingly under assault from dangerous levels of disease-causing bacteria and viruses. And Michigan is the only state in the country without a uniform sanitary code, she wrote in a commentary for a think tank.

Recently, the three counties in the Mid-Michigan District Health Department — Gratiot, Clinton and Montcalm — said it's time for regulations on septic systems in their area. An officer of the health department told citizens that estimates suggest 15 to 20 percent of homes along local rivers have no onsite system or have a failed system. Members of a health department committee are drafting an ordinance. It will go to the three county commissions for approval. Rep. Lower's district includes Montcalm County and parts of Gratiot County.

Clean Water Action is on board with the idea of a state code, too. The national environmental advocacy group, which has branch offices in the state, says the bills need to be strengthened with a sustainable funding mechanism for local health departments so they can carry out duties under the code, and with an inspection of entire systems at least every 10 years. The current bills specify inspections of tanks only.

In the Upper Peninsula, the Marquette County Commission approved a resolution opposing the bills. Gerald Corkin, board chairman, was quoted in *The Mining Journal* as saying, "As far as Marquette County, with the local control, it's worked very well, and (for the Legislature) to come out with new mandates and increase the cost and everything, we just don't see that it's necessary here and the rest of the counties in the U.P. feel the same."

The House Fiscal Agency says the costs of the bill are hard to project because the state has never administered such a program. The agency estimated the special fund would average about \$3.25 million annually, but it is unclear whether the cost of the program will match the revenues.

Delaware

A poultry producer has agreed to pay a \$600,000 penalty for violating wastewater regulations. The penalty will be reduced to \$420,000 if the company improves drinking water for nearby residents within 60 days.

For several months Mountaire Farms had been required to supply bottled water to people near its Millsboro chicken plant because their wells may be contaminated with high levels of fecal coliform bacteria and nitrate.

The state Department of Natural Resources and Environmental Control said in 2017 that the company released hundreds of gallons of wastewater containing 41 times the permitted level of nitrate and up to 5,500 times the permitted level of fecal coliform. The department also said Mountaire land-applied more than 2 million gallons of activated sludge without the plan required by state rules.



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Once the agreement is approved by a judge, the company will have two years to build a new onsite facility. Several Mountaire Farms employees were fired as a result of the violations.

Colorado

Gunnison County commissioners voted in June to require onsite system inspections before title to a property is transferred. Inspections would be valid for two years. The rule is intended to cover properties in unincorporated areas of the county that are not part of any other special area. Property owners in the Crested Butte watershed, for example, are required to have their systems inspected every two years.

Any system repaired or built within the last four years would be exempt from the new rule. Also exempt would be property transfers because of death or foreclosure.

Brionna Aljets, CEO of the Gunnison Country Association of Realtors, tells the *Crested Butte News* that the rule is unlikely to inhibit property sales. Many buyers already have onsite systems inspected as part of the purchase process, she says.

Connecticut

Three men were arrested for illegally dumping septage into a storm sewer, reports the *News-Times* of Norwalk.

Police say the three men dug a hole at a home and pumped a significant amount of waste from the 1,000- or 1,500-gallon tank into a storm drain. A neighbor tipped off police to the activity.

Francisco Tomas Vidal of Danbury; Pablo Pintado Penaloza of Manhattan, New York; and Oscar Anselmo Hernandez-Jimenez of Spring Valley, New York, were arrested on suspicion of illegally dumping hazardous waste, criminal mischief in the third degree, and breach of peace.

Quebec

The city of Laval is removing the risk of unpumped septic tanks by doing all pumping itself. Residents of the city, which occupies an island on the northwestern side of Montreal, will have their tanks emptied every two years by the city if they are not connected to a municipal sewer system. Before a tank is pumped, citizens must locate the tank access and make sure there are no obstacles for the pumping contractor.

Residents who need to have a tank pumped more often, or who have properties with more than one tank, must assume the extra expense and arrange service with the contractor appointed by the city. □

"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.

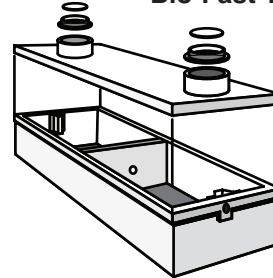
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Take Steps to Protect Your Valued Crew From Vocational Hearing Loss

Pumpers and installers are constantly exposed to loud noises that can cause permanent damage

By Jared Raney

Gene Morris, industry veteran and Jarvis Septic & Drain owner, can attest to the dangers of noise exposure over time: “I’m 56, and my hearing above 2,000 hertz is gone. It’s just from not wearing hearing protection in my younger days.”

It’s a common trend among older operators and contractors. Despite regulations for hearing protection, this safety issue struggles for recognition and enforcement.

“We as young men think we’re Superman, and we’re never going to have those kinds of issues,” Morris says. “I do think the noise coming off the equipment, and even in general — the years and years and years of riding in the trucks — does take its toll on the hearing of the driver.

“Most of those older gentlemen who have experienced some hearing loss realize, ‘Oh, I better do something before it’s completely gone.’ I certainly think it’s something that needs to be addressed by the business owners to protect their employees because there is definite hearing loss associated with the industry.”

INDUSTRY REGULATIONS

Risk of damage to your hearing is a combination of how loud the sound is, how close you are to the source of the noise, and how long you’re exposed to that noise. “It isn’t a solid, continuous sound at a particular level. The measurement that they require is what they call a time-weighted average,” says Julie Steding, marketing manager for Sonetics.

Normal conversation is around 60 dB. Occupational Safety and Health Administration guidelines require mitigation when sound reaches 90 dB over an eight-hour shift.

continued >>

“We as young men think we’re Superman, and we’re never going to have those kinds of issues. I do think the noise coming off the equipment, and even in general — the years and years and years of riding in the trucks — does take its toll on the hearing of the driver.”

Gene Morris



Contractors wear Sonetics headsets to protect their hearing from the loud trucks they are using each day. The devices also allow communication to continue between the operators. (Photo courtesy of Sonetics)

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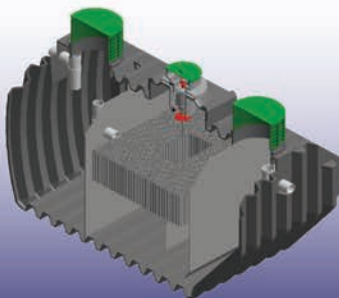
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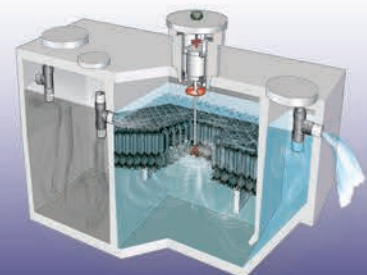
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Though that seems like a small difference, “The decibel scale is logarithmic; it’s not linear. A 1 dB increase is a tenfold increase in the actual level of sound, so it scales up very quickly,” Steding says. “The difference between 60 and 90 is very noticeable. There’s no mistaking that there’s loud noise going on.”

At 100 dB, the allowable time frame for exposure is 2 hours. At 115 dB, OSHA guidelines show damage can occur after only 15 minutes of exposure or less.

“If you stand at the back of a vacuum truck and you open the valve and let the air free flow into the vacuum truck, you’re looking at the equivalent of a jet engine,” Morris says. “We’re in excess of 120 dB standing at the back of the truck.”

The burden is on business owners to provide mitigation when sound passes the OSHA threshold, meaning owners are also responsible for monitoring sound levels at their facilities and job sites. Fortunately, there are many ways to reduce noise for employees.

“What the regulation specifies is simply a noise level at which sound attenuation is required, or some sort of noise mitigation effort is required, and that’s one thing that I think people overlook sometimes; it doesn’t necessarily have to be exclusively or even only hearing protection devices that you employ to try to mitigate the sound,” Steding says.

Sound mitigation falls into three categories: isolation, passive protection, and active protection.

SOUND ISOLATION

Noise mitigation efforts may begin by trying to isolate the source of the noise from the general population. “So you put loud equipment in a quiet room with extra sound insulation to protect the rest of the facility from the noise of that equipment,” Steding says.

This sound isolation can be an important factor when choosing equipment. Many manufacturers, such as Imperial Industries, consider sound level in their product design.

“On our vane pumps, we locate the oil catch muffler on the other side of the truck, and with the blower, typically we locate the silencer on the opposite side of the truck as well. That helps bring down the noise,” says Kyle Haase, Imperial Industries commercial sales manager.

Remote-controlled rigs are another option, allowing operators plenty of distance from the equipment.

“Remote is the big push on our end,” Haase says. “You’re not directly in front of the pump when you’re operating. Usually you’re at the actual lid or the hole, and that’s where you’re doing all of your operations with the wireless remote, so the end user is not standing directly in front of the pump.”

If a particular manufacturer doesn’t have sound-mitigating options, there are ways for contractors to limit noise on their own.

“I have found that some of the camlock fittings we use on our hoses produce a different decibel of sound,” Morris says. “I stumbled on it by accident, and I’ve actually switched all my hose couplings.”

The configuration of the coupling makes a difference on the airflow, changing the pitch. Morris also recently changed his vacuum truck over from a vane pump to a blower, which he thinks is quieter — but it may not be as simple as one being quieter than the other.

“A lot of our units use the National Vacuum Equipment blowers, and they’re fully enclosed in a cabinet that is all insulated as well, so that helps reduce the noise,” Haase says.

“If you stand at the back of a vacuum truck and you open the valve and let the air free flow into the vacuum truck, you’re looking at the equivalent of a jet engine.”

Gene Morris

PASSIVE VS. ACTIVE PROTECTION

Even when doing everything possible on the equipment side, it’s still heavy machinery. At a certain point, the focus needs to shift onto operators, and the simplest solution comes down to earplugs and earmuffs, which OSHA defines as passive protection.

“Passive noise attenuation is a reduction in the sound pressure level that reaches your eardrums,” Steding says. “So earplugs and earmuffs tend to be passive noise attenuation, meaning they work by virtue of covering up your ears, or plugging up your ear canal. They are not employing any kind of active strategy.”

There are different levels of protection even within this basic category.

“Depending on the manufacturer and the style, they have differing amounts of noise attenuation, or sound reduction that goes on,” Steding says, adding that contractors need to use them properly. “I emphasize wearing them properly because there’s a way to wear them improperly that will reduce their effectiveness. You don’t want to just hand someone a hearing protector without any kind of instruction.”

Going one step further, an active attempt for hearing safety would be some sort of technology in the hearing protector that further reduces the amount of noise a contractor is exposed to. This kind of upgrade provides added safety and communication efficiency on top of noise attenuation.

For example, Sonetics’ wireless communication headsets provide 20 dB of passive protection, also incorporating “listen-through technology.” It is an adjustable noise control technology that lets in certain amounts of outside sound to balance protection and awareness on any particular job site.

KEEP YOUR HEARING

In industries saturated with rules and regulations, it can be easy to overlook something as seemingly innocuous as hearing safety. Contractors who have been around long enough can tell you it’s worth keeping in mind — and not just for the benefit of employees.

“Hearing protection should be provided. It should be mandatory that it be worn,” Morris says. “Even though it’s not popular, if the employee is not using the hearing protection, the business owner should write them up to protect themselves from a possible OSHA violation.”

As the invisible threat, its effects can take a long time to manifest, as Morris and many contractors like him are lamenting later in their careers.

“It’s something that young men need to realize — that you can lose your hearing around this type of work,” Morris says. “Like I said, in our younger days we think we’re Superman and we’re invincible. Reality catches up with you, but by the time it does, it’s too late.” □



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In Oregon, It's Time to Update Our Certification Program

'We are professionals! Professionals want to learn, to apply that knowledge and to better themselves.'

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 Oregon Onsite Wastewater Association.



Trent Clinkscals

owner

Business: Clinkscals Portable Toilets & Septic Service, Molalla, Oregon

Age: 49

Years in the industry: 28

Association involvement:

I serve in the pumper seat in the Oregon Onsite Wastewater Association (O2WA) and have served seven years on the board. I'm currently the president. I was president in 2013 as well.

Benefits of belonging to the association:

Education is a big benefit. Installers and operations and maintenance providers in Oregon are required to pursue continuing education credits. O2WA hosts two conferences each year: a two-day conference in the spring and a one-day conference in the fall. We offer scholarships for our members and their families. We are also a NOWRA - National Onsite Wastewater Recycling Association affiliate.

Biggest issue facing your association right now:

We have a very dedicated board with many great ideas. The challenge becomes getting all these ideas put into motion as a volunteer organization. Right now we're trying to update the certification class. For Oregon we have to have a certification program for installers and for maintenance operators, and the class has become pretty stale. It hasn't had a serious overhaul in a long time. We don't have any paid staff to push these projects through. We entered into a memorandum of understanding with the Oregon Department of Environmental Quality two years ago, and we just finally signed a contract with the contractor who is going to update the class.

Our crew includes:

Lorry Clinkscals (my wife) and Tessa Shankle handle the office work. Charlie Bennett is our septic driver. Nick Clifford, Arron Adams and Ad Paquin are portable toilet route drivers.

Typical day on the job:

I arrive to work shortly before the crew, usually about 7:45 a.m. I help them with questions about their routes or jobs for the day. I handle any problems with trucks, overflow septic jobs, or where Bennett, who has been doing septic for a couple years, needs my expertise. I help Lorry Clinkscals and Shankle with developing quotes. I deliver and pick up luxury restroom trailers. I also make parts runs and usually go to the bank and post office. Essentially, I'm a jack-of-all-trades and fill in where needed.

The job I'll never forget:

While not a septic job, the one I'll never forget is helping a portable restroom operator with the solar eclipse event in Madras, Oregon, last year. It was nuts. My wife and I went and took our small septic truck (1999 International 4900 with a Lely Tank & Waste Solutions 1,700-gallon waste and 300-gallon freshwater steel tank and Masport pump). We were going to take two trucks, but right before we left, one of them broke down. The crowds were amazingly gracious while we struggled to keep up with the demand for clean restrooms. One lady handmade a card with an eclipse design using yellow and black construction paper. She wrote a note about how grateful she was for our service. I wrote her a thank-you note and have (the card) hanging on my wall. The eclipse itself was awe-inspiring; it was just amazing.



▲ A 2006 Yamaha Grizzly 700 all-terrain vehicle used by Trent Clinkscales on a challenging work site.

My favorite piece of equipment:

I love my drain cameras. I just bought a new one — a RIDGID CS6xPak, but we've had a Spartan Tool Sparvision 200 for six or seven years. I had been talking about getting one for a long time. But there was one project where I'd gone out to locate a drainline and was convinced the septic tank was under a deck. I was positive. I had the contractor come out and tear the deck boards off and we were digging 3 or 4 feet deep. It took several days. One day we were over near some trees to "take a break," and we noticed a depression in the ground that looked like maybe it was the tank. And, sure enough, a quick probe stab and 6 inches into the ground there was the tank — about 45 feet away from the deck. Hours of labor were lost and I had to pay to replace the deck. So, it was time to get a camera. It gives us the ability to know exactly what's going on inside the pipe. Or when we're locating a septic tank, it's just so easy to send the camera down there. You can see all the way (providing the pipe isn't plugged) to the tank so I know definitely I'm at the septic tank. Or I know exactly that the pipe is broken in this spot.

Most challenging site I've worked on:

It was an existing system evaluation where the drainfield was on the other side of a deep ravine. In order to get the camera and locating equipment to the site, we strapped everything on my all-terrain vehicle (2006 Yamaha Grizzly 700) and drove down and back up the steep slope. Although the homeowners rode their motorcycles back there, there wasn't a trail big enough for the four-wheeler so they had to clear a path for us. It was steep going down and steep going back up the other side to where the drainfield was. But it worked out really well. It saved a lot of trips back and forth, up and down the draw.

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

"Can't you just dump that on my field?" No, I really like my license and reputation intact!

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

This is a hot topic on the O2WA board right now. We would like to see either a tiered certification program on both the installation side and operations and maintenance, or we have even talked about an apprenticeship-style program. Right now for the O&Ms, and even on the installer side, the certification is just a blanket certification allowing you to install or operate any system out there. Well, it's one thing to operate a residential system versus going to a big commercial site that's got high-strength waste and that sort of thing.

So, you get guys who are brand-new and don't really have any experience on some of this stuff and they're in over their heads. What we're seeing is that these guys are failing. The systems are not performing the way they're supposed to. That's why we're talking about either an apprenticeship program where these guys get the skills they need by learning from somebody else or a tiered system where there's that next step of classes they have to take and pass before they can go on to operate or install the bigger systems.

And for pumpers, you only have to buy your license and get a bond and you're a pumper — but you may not know anything. That's the way it was when my dad started the company back in the early 1980s. We should be better than that now. Our association wants to get a lobbyist involved so we can get the laws changed.

Best piece of small-business advice I've heard:

A contractor friend told me years ago to make sure to "get paid!" Seriously. As an industry we often undervalue ourselves. We serve an important role in protecting the environment and people's health. We need to be compensated accordingly.

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

Hopefully be retired and travelling with Lorry Clinkscales!

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

I feel that with organizations like the O2WA, NOWRA, National Association of Wastewater Technicians, Portable Sanitation Association International, etc., professionalism is increasing. There is still a long way to go, but collectively we are making progress. Ideas like tiered certifications and apprenticeships come with great opposition from some folks who would rather keep the status quo. We must keep striving to become better than that. We are professionals! Professionals want to learn, to apply that knowledge and to better themselves. □

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.

System Repair/ Drainfield Rejuvenation

By Craig Mandli

AEROBIC TREATMENT

Knight Treatment Systems White Knight Microbial Inoculator Generator

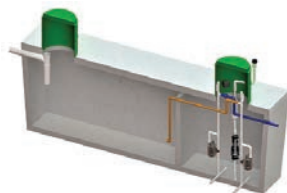
The White Knight Microbial Inoculator Generator from Knight Treatment Systems offers an enhanced form of aerobic treatment technology that introduces, cultivates and releases selected microorganisms. It is designed to be simple to install in most septic tanks. It can be used to retrofit outdated ATUs and package treatment plants and enhance the performance of community and high-strength wastewater treatment systems in addition to septage processing facilities. 800-560-2454; www.knighttreatment.com.



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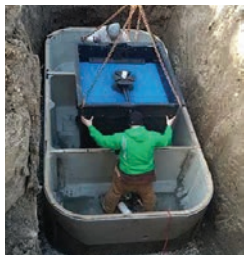
Anua PuraSys sequencing batch reactor

The Anua PuraSys sequencing batch reactor ships in a boxed kit that can be installed in hours in any standard septic tank, requiring no additional space. The kit includes a control panel, floats, pre-drilled siphon pipe, PVC pipe stands, siphon/sludge pump, aerator and a drainfield pump. It can be used for new construction or be retrofitted into existing tanks to renovate biologically failed trenches or sand mounds. It uses a 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. It is certified to NSF/ANSI 40 Class I and to NSF/ANSI 245 (nitrogen reduction). Residential and commercial configurations are available. 336-547-9338; www.anuainternational.com.



BioMicrobics MicroFAST

MicroFAST wastewater treatment systems or MicroFITT-ee (energy-efficient version) systems from BioMicrobics are integrated into a standard septic tank. With the SFR feature, alternate modes of operation include intermittent operation of the blower to reduce electricity usage up to 45



percent and recirculation of nitrified wastewater to the primary settling chamber for extra denitrification. Its biosolids treatment and sludge digestion enable cost-effective treatment with less maintenance. Available from 500 to more than 9,000 gpd applications, technology easily scales up for larger residential and commercial flows. The stability of the treatment process with fully submerged, fixed-film media and the effectiveness of activated sludge treatment helps in certain difficult applications and where there may or may not be infrastructure available. The effluent meets secondary quality requirements and can be distributed to a soil treatment system or water reuse applications (with drip-tubing irrigation or other nonpotable use). 913-422-0707; www.biomicrobics.com.

Norweco Singulair Green

The Singulair Green advanced treatment unit from Norweco is designed to quietly, efficiently and automatically treat all domestic wastewater in just 24 hours. The durable, watertight HDPE tank can be used for either new or replacement applications. It is easily installed and offers single-tank convenience.



The all-in-one system contains pretreatment, aeration, clarification, filtration, flow equalization, and optional disinfection and dechlorination. Incorporating support ribs and an inherently strong arch shape, the durable tank is designed for a long life span. Designed for domestic wastewater flows up to 600 gpd, with treatment performance meeting or exceeding the strictest state and county requirements, it is certified by NSF to Standards 40 and 245 for nitrogen reduction. 800-667-9326; www.norweco.com.

Orenco Systems AdvanTex AX-RT

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.orenco.com.





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Featuring a single monobloc unit integrating a primary tank and a biofilter, the all-in-one Ecoflo PACK treatment system from Premier Tech Aqua is now offered in 500- and 600-gpd capacity. It is suitable for primary and secondary homes, and it's fast and easy to install with smaller equipment. It can integrate the DiUV

Classic kit when disinfection is needed. It is a permanent septic solution based on a compact filter technology that treats wastewater without energy. The system retains pollutants thanks to its 100 percent organic coco husk fragment-based filtering media. It offers ease of maintenance and the benefits of a recyclable filtering media that can be accessed via the lid at the end of its useful life. 800-632-6356; www.ecoflobiofilter.com.

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SeptiTech STAAR (Smart Trickling Anaerobic/Aerobic Recirculation) filter systems are designed for both multifamily domestic and high-strength commercial wastewater from 100 to more than 150,000 gpd. Systems use partially submerged media to treat high organic loads that integrate with other technologies and accessories. The biological trickling filter also maintains low levels of Nitrate-N with all below-grade components that fit in available concrete, plastic or fiberglass tanks. Smart technology allows the system to go into a sleep mode that will dial down activity and eventually shut all power off until normal flow conditions are detected. This allows for reduced operating costs and power requirements. 207-333-6940; www.septitech.com.



BIO/ENZYME ADDITIVES

Bionetix International BIOBOOST Tablet 1T

BIOBOOST Tablet 1T from Bionetix International is a natural treatment for septic tank maintenance and aftershock treatment. It relies on a high-density, 1 trillion-count blend of bacteria with biological nutrients and stimulants to naturally biodegrade paper, oils, greases and waste. It is especially efficient for treatment after toxic shock from the use of strong bleaches or other harmful chemicals, such as root killers for removing roots from pipelines, according to the maker. The tablet nourishes and replenishes bacteria in the septic tank to biologically digest waste and reduce sludge buildup. Results of this treatment include reduction of odors and methane, prevention of pipe and drain blockage, and decrease of septic tank pumping frequency. It replaces chemical products and does not attack plastic or metal pipes. Use two tablets in the startup month, followed by one tablet per month for maintenance. 514-457-2914; www.bionetix-international.com.



Ecological Laboratories PRO-PUMP Super Bio-Remediation Kits

PRO-PUMP Super Bio-Remediation Kits from Ecological Laboratories

are designed to recover flow in fouled and ponding absorption fields. PRO-PUMP/HC (High Count) is a mixture of select, live vegetative bacteria that will break down and remove slow and difficult-to-degrade compounds, according to the maker. 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 designed to rapidly break down and degrade the organic compounds that reduce absorption flow recovery. 800-326-7867; www.propump.com.



Jet Inc. Bio Jet 7

The Bio Jet 7 series of bacterial supplements from Jet Inc. offers biological aids designed to accelerate the degradation of FOG, proteins, tissues, soap scum, and other organics in residential, commercial, and municipal wastewater applications. Nonhazardous and nontoxic, it is a blend formulated to assist biological activity in septic systems, aerobic wastewater treatment systems, lift stations, lagoons and retention ponds. The supplements are effective for difficult startups, daily maintenance to meet system discharge requirements, or when a system becomes unstable due to changes in flow, chemicals, or increased organics, according to the maker. Continuous use can help decrease odor, maintenance and emergency line blockages. It is available as ready-to-use, quick-dissolving, flushable dry packs conveniently packaged as a one-year supply in a recyclable plastic canister. A liquid version is available in 1-, 5- and 55-gallon containers. 800-321-6960; www.jetincorp.com.



PORTABLE JETTERS

General Pipe Cleaners/General Wire Spring JM-3080 Jet-Set

The JM-3080 Jet-Set water jet drain-cleaning machine from General Pipe Cleaners/General Wire Spring is designed to clear stubborn grease stoppages, as well as lines clogged with sand, sludge, and ice.

It has a removable 300-foot-capacity hose reel to allow use in remote or indoor applications. It generates 3,000 psi at 8 gpm. Vibra-pulse on demand helps the hose slide easily down long runs and around tight bends. A 20 hp Honda engine with electric start and two-to-one gear reducer drives the pump, while a 12-gallon buffer tank protects the jet if the water supply can't match the pump demand. It is mounted on a tubular frame with four 13-inch



PRODUCT FOCUS

flat-free foam-core tires and a wheel brake. Safety features include a thermal relief valve to protect the pump from heat damage, along with a backflow check valve and inlet filter. It comes with a toolbox and spray wand. 800-245-6200; www.drainbrain.com.

MyTana Mfg. M30 MaxBlast

The M30 MaxBlast gas-powered jetter from MyTana Mfg. is designed for portability without sacrificing cleaning power and efficiency. Its 390 cc Honda engine with electric start clears blockages with 4.5 gpm at 3,000 psi in 1 1/2- to 6-inch lines. Its 10-amp recharge system and thermal pump protection keep users safe, and a detachable hose reel leaves exhaust outside during indoor jetting. With 1/8- and 3/8-inch hoses, it combines the power of a mainline jetter with the convenience of a medium-line jetter, according to the maker. It comes with stair glides and 10-inch pneumatic tires with swivel castors with locks, so it's easy to load, maneuver, disassemble, and use. 800-328-8170; www.mytana.com.



Pipeline Renewal Technologies Cleansteer 40

The Cleansteer 40 from Pipeline Renewal Technologies uses high-pressure water for propulsion, steering and cleaning as it captures live inspection video from inside lateral lines. It is able to traverse multiple bends in pipe, steer through branches, and levitate above debris, allowing users to locate failed pipes, cross bores, and blockages, as well as perform cleaning, according to the maker. It is fully water-driven, as six propulsion nozzles generate the power needed to pull its flexible hose through multiple bends, and a side nozzle on the camera can be aimed to steer through diverging pipes and hover past obstacles. An optional forward-facing nozzle can be pulsed to clear debris and other obstructions. The system works with any high-pressure water source, including pressure washers and combination trucks. Its 1/2-inch hose comes in lengths of 115 to 190 feet. 866-936-8476; www.pipeliner.com.

RIDGID KJ-2200

The RIDGID KJ-2200 water jetter propels a highly flexible hose through 1 1/4- to 6-inch lines to remove sludge, soap, and grease blockages, according to the maker. As users pull the hose back, it power scrubs the line, flushing debris away, and restoring drainlines to full, free-flowing capacity. A working pressure of 2,200 psi and flow of 2.4 gpm provides fast, effective cleaning of lines. It comes standard with a 6.5 hp recoil-start gasoline engine for quick start and a FV-1 foot valve to make remote or indoor operation simple and convenient. The user controls the jetting action at the drain while leaving the jetter outdoors. Guide the hose into the drain while



the thrust propels the hose down the line. Activate the pulse action to easily navigate difficult bends and traps. The optional H-30 cart makes for easy transport. 800-769-7743; www.ridgid.com.

PRESSURE WASHER/SPRAYER

Water Cannon Inc. - MWBE pressure washers

Pressure washers from Water Cannon Inc. - MWBE feature a recirculation module that cools the water while the trigger gun is closed. The triplex ceramic plunger pump is designed for both commercial and professional daily use. To protect wear parts, it includes an over-heat safety valve that will open and close automatically to allow the recirculating higher-temperature water to be released, allowing cool water to replace it. 800-333-9274; www.watercannon.com.



SEPTIC DRAINFIELD RESTORATION

Arcan Enterprises Septic-Scrub

Septic-Scrub chemical additive from Arcan Enterprises is designed to help remove sludge that builds up and sticks to the stone in a drainfield, pit, or sand mound to 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.



Clarus Environmental WW4

The WW4 effluent filter from Clarus Environmental is mounted in the outflow of the septic tank to provide protection from solids moving out of the tank into the dispersal area. A secondary screen provides continued protection during servicing. When the primary cartridge is removed to be cleaned, the secondary screen blocks solids from sloughing off and traveling to the dispersal area. After the primary cartridge is cleaned, the secondary screen can be removed and cleaned. It can handle up to 4,000 gpd and can be assembled on site in a multifilter configuration for larger flows. 800-928-7867; www.clarusenvironmental.com.



Geomatrix Systems SoilAir

SoilAir from Geomatrix Systems intermittently aerates the drain/leachfield and the surrounding soils rather than constantly aerating the wastewater in a tank. This process allows rapid rejuvenation of failed septic systems, extends the life span of new leachfields, and enhances treatment, according to the maker. Systems can serve single and multifamily homes, as well as challenging and high-strength waste streams, such as restaurants, hotels, marinas, laundromats, health care facilities, grocery stores, food processing facilities, and convenience stores. 888-764-5247; www.soilair.com.



Helix Laboratories DrainScrub

DrainScrub from Helix Laboratories is an enzyme drain and septic cleaner designed for septic field rejuvenation. Mix the powder in water and pour into the tank and field through the vent, distribution box, or clean-out. Billions of microbes are reintroduced and digest the clogs and restore proper drainfield function, according to the manufacturer. 877-444-3549; www.drainscrub.com.



NextGen Septic GenX Retrofit

GenX Retrofit septic technology from NextGen Septic can be installed into any approved septic tank and works to repair a clogged soil drainfield. It includes a compact, stand-alone, automated, two-stage treatment system for domestic sewage that produces a clean-water output. The sewage is collected in a tank, where soils are broken down under anoxic conditions, while the wastewater is aerated with biomedica and low-noise submersible pumps in the secondary compartment. The second stage, which occurs in a separate treatment unit, treats nitrogen and phosphorus through a no-maintenance-required membrane and ozone disinfection system that lets water and salt pass through, while rejecting the solids and dissolved organic contaminants to create a clean-water output suitable for surface discharge. The clogged field begins to percolate water in as little as eight to 12 weeks, once the biomat thickness becomes small enough to allow water to get through at a reasonable rate, according to the maker. 513-673-3583; www.nextgenseptic.com.



VENT PIPE FILTERS

Pagoda Vent septic vents

Septic vents from Pagoda Vent are designed to help enhance system function with landscape appeal and homeowner approval. The units are designed to provide the necessary ventilation to the drainfield and have a durable, lightweight exterior that won't fade or rust, according to the manufacturer. The units encourage a healthy subsurface environment, mitigate harmful gases, and preserve concrete component integrity by diminishing the opportunity for microbial-induced corrosion. Optional odor filter cartridges are available and fit concealed in the vent unit. 888-864-1468; www.pagodavent.com.



Presby Environmental Inc. (PEI) Ornavent

The Ornavent from PEI is designed to disguise septic vents. It is easy to install and comes in different colors and designs fitting on Schedule 35 and 40 PVC. It is designed to replace the aesthetics of the candy-cane vent while providing sufficient ventilation to the aerobic bacteria in a septic system leachfield and allowing for gas exchange within the system. 800-473-5298; www.presbyeco.com.

Simple Solutions Distributing Super Wolverine

The solar-powered Super Wolverine vent filter from Simple Solutions Distributing is designed to eliminate odorous airflows up to 10 cfm, and the solar fan vents the tank, reducing accumulation of sewer gas. It holds between 8 and 10 pounds of activated carbon and is available with inlet sizes between 3 and 6 inches. It can be used for larger aerobic systems found at restaurants or on small commercial buildings. It has an optional saturation indicator for monitoring the life of the carbon bed and uses a 2-inch drain plug for media replacement. 800-667-8465; www.industrialodorcontrol.com. ■



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System Repair/Drainfield Rejuvenation

By Craig Mandli

Septic aerator saves property from condemnation

Problem: A residential system in Wisconsin exhibited symptoms of failure in 2002 with surface ponding and surface discharge in an area about 20 feet in diameter. The system serviced a 40-year-old, four-bedroom home with three occupants. The tank is 890 gallons, and the 12-month average flow rate was 174 gpd, with a monthly low average of 150 gpd and monthly high average of 209 gpd. Green County issued violation notices for two years. The next step would be condemnation of the home.

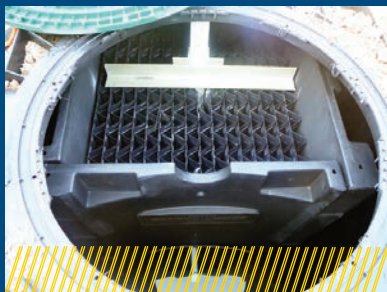


Solution: An Aero-Stream Remediator septic aerator was installed in the tank. After 10 days, most of effluent surfacing ceased. After installation, the average BOD₅ was 11 mg/L and the average TSS was 21 mg/L.

Result: Within 60 day of installation the surface ponding was eliminated. The BOD₅ and TSS were reduced more than 85 and 96 percent respectively. Fecal coliform was reduced by 97 percent. 262-538-4000; www.aero-stream.com.

System utilizes fixed-film bioreactor to meet permit

Problem: A Washington state homeowner was faced with an aging conventional septic system but wanted to subdivide the property and retain dedicated wastewater treatment service for the existing home. Due to permitting requirements, any new system required secondary treatment to satisfy vertical separation. Several wastewater treatment options were rejected due to size requirements, cost and construction challenges.



Solution: The chosen design features a Delta Treatment Systems ECOPOD-N fixed-film bioreactor system installed in an Infiltrator IM-1060 plastic reactor tank. Effluent discharges from a pretreatment tank and enters the ECOPOD-N, where it is introduced to an oxygen-rich environment. Here, the biomass develops and is capable of digesting

biodegradable waste into carbon dioxide and water. This process continues as the biomass is supplied with incoming wastewater and oxygen. The effluent is then time-dosed to the 212-linear-foot Infiltrator Quick4 Plus Low Profile chamber drainfield with pressure distribution. The system is used for individual residential installations, cluster designs and small-to-medium commercial wastewater treatment applications. Certified to ANSI/NSF International Standards 40 and 245, it is FHA and VA acceptable and suitable for intermittent usage with an average nitrogen reduction of greater than 50 percent.

Result: The system enabled the homeowners to address their future subdivision goal. 800-219-9183; www.deltatreatment.com.

Filtration system proves successful on sloped site

Problem: An event and lodging venue in Randolph, Kansas, needed a septic system for a five-bedroom cabin. The available area had a shallow limiting layer, and the owners were looking for a low-maintenance solution that would minimize site impact and limit the amount of borrow material needed to construct an above-grade system. The site had an 8 percent slope, with a 0.5-gallon-per-square-foot application rate for treated effluent.



Solution: Alternative Systems Kansas helped design an above-grade bed using 52 Eljen GSF A42 modules that applies secondary level treated effluent to the native soil. The 625-gpd system was able to be gravity fed due to the natural slope on the site. Jacob Brenner from Brenner Excavating installed the bed system on a base of ASTM C33 sand, using four laterals, with overall dimensions of 24 feet wide by 53 feet long. Effluent is distributed through 4-inch SDR 35 perforated pipes on top of the modules. An Eljen-supplied gray geotextile fabric was then laid on top of the rows of modules before backfilling. The system was covered with a 3-1 slope.

Result: Mature landscaping was preserved, and the cover over the raised system blends in with the existing slope. The system treats the effluent to NSF Standard 40, which helps protect the nearby lake. 800-444-1359; www.eljen.com. □

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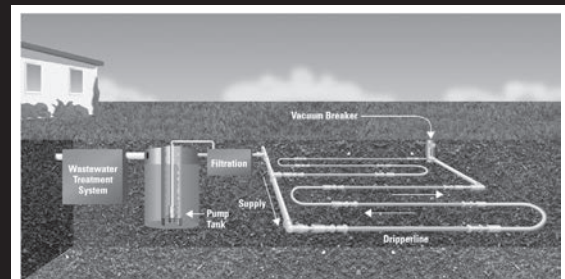
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ILLINOIS

Onsite Wastewater Professionals of Illinois;
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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;
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KANSAS

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

KENTUCKY

Kentucky Onsite Wastewater Association;
www.kentuckyonsite.org; 855-818-5692

MAINE

Maine Association of Site Evaluators;
www.maine.com

Maine Association of Professional Soil Scientists;
www.mapss.org

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Maryland Onsite Wastewater Professionals Association;
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Yankee Onsite Wastewater Association;
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Michigan Onsite Wastewater Recycling Association;
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Michigan Septic Tank Association;
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MISSISSIPPI

Mississippi Pumpers Association;
www.mspumpersassociation.com; 601-249-2066

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

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Nebraska On-site Waste Water Association;
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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

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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; 252-249-1097

OHIO

Ohio Onsite Wastewater Association;
www.ohioonsite.org; 888-294-0084

OREGON

Oregon Onsite Wastewater Association;
www.o2wa.org; 541-389-6692

PENNSYLVANIA

Pennsylvania Association of Sewage Enforcement Officers; www.pa-seo.org; 717-761-8648

Pennsylvania Onsite Wastewater Recycling Association; www.powra.org

Pennsylvania Septage Management Association; www.psmna.net; 717-763-7762

TENNESSEE

Tennessee Onsite Wastewater Association; www.tnonsite.org

TEXAS

Texas On-Site Wastewater Association; www.txowa.org; 409-718-0645

Education 4 Onsite Wastewater Management; www.e4owm.com; 713-774-6694

VIRGINIA

Virginia Onsite Wastewater Recycling Association; www.vowra.org; 540-377-9830

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Washington On-Site Sewage Association; www.wossa.org; 253-770-6594

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Wisconsin Onsite Water Recycling Association; www.wowra.com; 888-782-6815

Wisconsin Liquid Waste Carriers Association; www.wlwca.com; 888-782-6815

NATIONAL

Water Environment Federation; www.wef.org; 800-666-0206

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WCOWMA Onsite Wastewater Management of B.C.; www.wcowma-bc.com; 877-489-7471

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Waste Water Nova Scotia; www.wwns.ca; 902-246-2131

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

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