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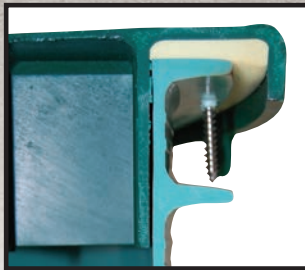
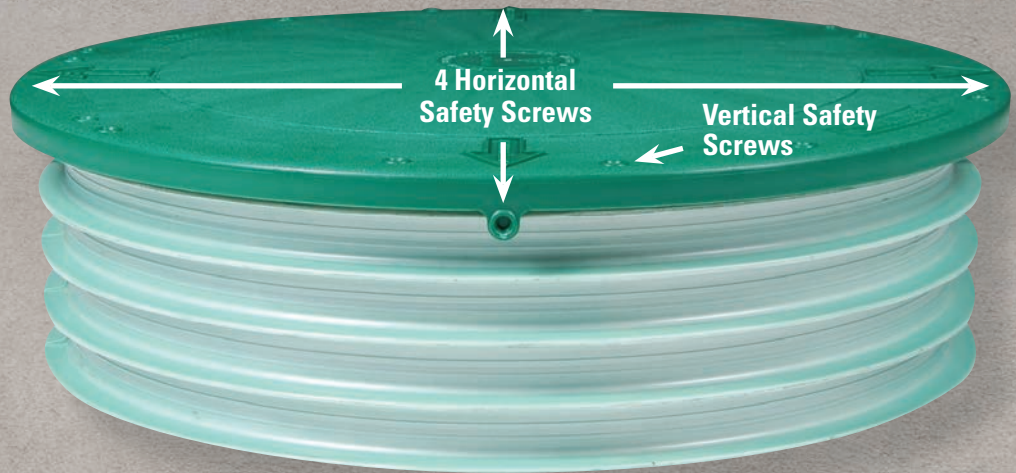
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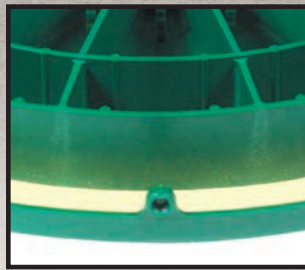
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INSTALLER PROFILE:

Can You Dig-It?

By David Steinkraus

ON THE COVER:

A smart marketing message and expanding territory keep the work calendar full for Michigan's Dig-It Excavating. Owner Dervin Witmer is shown with a Cat excavator and one of his Kenworth vacuum trucks, built by Curry Supply and carrying a National Vacuum Equipment blower. (Photo by Lucian Witmer)

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Published monthly by



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EDITORIAL CORRESPONDENCE

Send to Editor, *Onsite Installer*, P.O. Box 220, Three Lakes, WI 54562 or email editor@onsiteinstaller.com.

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Visit www.onsiteinstaller.com for options and pricing. To order reprints, call Jeff Lane at 800-257-7222 (715-350-8447) or email jeff.lane@colepublishing.com. To order back issues, call Holly at 800-257-7222 (715-350-8424) or email holly.gensler@colepublishing.com.

CONTROLLED CIRCULATION: 18,500 per month

This figure includes both U.S. and International distribution.

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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.



Send your comments, questions or opinions to Jim Kneiszel at editor@onsiteinstaller.com.

Contemplating the Value of Onsite Wastewater Solutions

Weighty issues come to the forefront, including public funds going to private septic systems and the religious rights of Amish people to refuse to meet graywater treatment standards

Let's dig into the *Onsite Installer* news and views grab bag and pull out items to discuss amongst ourselves.

Do you think about onsite systems as the more reliable wastewater option?

A reader of the *Port Charlotte Sun* in Florida wrote a letter to the editor in which she argued individual private septic systems act as a hedge against disastrous widespread infrastructure problems similar to the failure of the electrical grid in Texas earlier this year. Barbara Gavel said small-scale decentralized wastewater treatment provides advantages over large-scale sewer systems, especially if those systems are privatized like the Texas power grid.

sewer systems as a way to improve wastewater treatment and the environment? Do we ever stop to ask about the benefits of individual systems, and how the failure of one treatment system doesn't impact the wastewater flow down the line?

Individual failing decentralized systems can often be repaired to peak functionality without causing widespread negative impact on an entire community. But what happens when the municipal treatment plant has a problem? That could have a Texas-sized impact on a community and its precious environmental resources. So when you hear people in your community clamoring to replace septic systems with the big pipe, remind them that onsite treatment isn't always the lesser wastewater treatment alternative. Sometimes, as a wise and vertically challenged older woman once told me, "good things come in small packages."

When you hear people in your community clamoring to replace septic systems with the big pipe, remind them that onsite treatment isn't always the lesser wastewater treatment alternative. **Sometimes, as a wise and vertically challenged older woman once told me, "good things come in small packages."**

"There have been studies done on water quality in this area and have found no human fecal pollution in the waterways. This means the septic systems are doing their job. If taken care of and emptied on a regular basis, these systems work very well," Gavel wrote. "Installing a sewer system in an area with a high-water table can lead to disaster if the system breaks down and raw sewage leaks into the waterways. It happened in November of 2020. A line was broken ... spilling 48,000 gallons of raw sewage and another line ... spilled 800 gallons." She concluded: "Keeping septic systems in working condition is a much more environmentally friendly alternative."

She shares an interesting perspective and a valid concern. How often have we heard local governments tout the idea of expanding municipal

He thinks it's OK for the public to fund private septic system replacements. Do you?

A reader of the *Examiner News* in New York recently promoted the idea of taxpayer funding of onsite systems as potentially a more cost-effective way to address pollution problems near sensitive waterways over expanding public sewer systems. Jay Batchelor said he expects paying to

replace problem systems will be less expensive for residents than paying to hook up to sewers and pay annual fees indefinitely.

"The \$10 million in East of Hudson funds would pay for these failing systems at no cost to the resident, with money left over to actually dredge and aerate the lake," he explained. "These systems range from \$5,000 to \$22,000. The maintenance fee is \$375 a year; pumps last for seven to 10 years. These systems run on about 2 amps, which is equivalent to two 100-watt lightbulbs. This is cheaper than \$1,187 annually for sewers."

Batchelor is essentially saying, "do the math," and then choose the best solution to achieve a cleaner environment, even if that means private homeowners derive a substantial benefit. This idea benefits the few on one level, but it benefits the many in another way.

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The East of Hudson funds are part of a \$38 million allocation from the New York City Department of Environmental Protection to protect critical watersheds. Across the country, we're seeing more public funds earmarked for both public and private projects aimed at water quality issues.

We all want to stress the need for personal responsibility — in other words, clean up your own messes — but strong cases are being made that these investments are necessary for the greater good. The onsite installing industry is a beneficiary of generous funding programs. Governments are recognizing the value of decentralized wastewater treatment and installers are ready to provide the advanced solutions to ensure clean water for future generations.

Can religious freedom be infringed by a graywater treatment requirement?

I've been watching a battle between an Amish religious sect and the Minnesota Pollution Control Agency over graywater disposal for several years and I never thought the case would rise to the U.S. Supreme Court. But in fact, earlier this year, members of the Amish community petitioned the high court to weigh in on this issue.

Since 2015, four members of the Fillmore County Swartzentruber Amish community have fought an order by county and state officials requiring them to install a graywater treatment system on their farms. They argued that mandating a subsurface treatment system under the county rules violates their religious freedoms. Instead, the Amish proposed what they said was an acceptable alternative, a mulch basin system, to handle the flow of graywater from their homes.

Depending on the Amish sect, some groups refuse to use electrical power or other modern conveniences in the name of religious traditions. In the past, governments have faced off with Amish over the use of outhouses

and pit toilets when septic systems are required by local codes.

Attorneys for the Amish argue questions under the Religious Land Use and Institutional Persons Act. They are, does the government have a compelling interest in regulating the disposal of graywater, which includes laundry, bath and dishwasher water? And is a septic system the least restrictive method when they argue that 20 states allow Amish-preferred mulch basin systems.

Lower courts ruled against the Amish in this case, prompting an appeal to the high court. "The Court of Appeals decision made it clear that all households in Fillmore County are required to comply with the Fillmore County subsurface treatment system requirements by installing proper septic systems," Fillmore County Attorney Brett Corson wrote in one statement to the media.

On its face, this seems like a minor legal skirmish. But it presents a weighty issue that has a tangential connection to the onsite industry. What takes precedence, the perceived religious objections to a particular form of wastewater treatment or the state's public health protection standards?

From where I'm sitting, the people of Minnesota should be able to expect uniform standards to protect public health and it's hard to see how individuals or a group should be able to skirt best practices or graywater treatment. Then again, I am not Amish and don't pretend to understand what makes a subsurface system objectionable and a mulch basin acceptable. What do you say?

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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STRONG SEALS

PVC Fittings and Joints

Proper application of fittings and joints is critical to a watertight piping installation. In onsite wastewater applications, the most common means of connecting pipe is with solvent-welded fittings but gasket fittings can also be used. Here's what you need to know about PVC pipe connections. onsiteinstaller.com/featured

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Photos courtesy of Shea Concrete Products Inc.

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Solution: The new system includes a precast concrete gravity grease interceptor and two 12,000-gallon AASHTO HS-20 traffic-rated precast concrete septic tanks. Both of the septic tanks are 17-feet-by-10-feet wide and more than 13 feet tall, and the concrete boasts a minimum compressive strength of 5,000 psi. The precast manufacturer created unique tank top slabs to accommodate the required access points and specially designed each tank in five sections for easy transport and to save space on the jobsite. The deliveries were scheduled strategically so that each component could be staged and installed promptly.



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PRECAST PROUD





CAN YOU DIG-IT?

With a strong marketing message, a Michigan installer puts his best professional foot forward and keeps on growing

By David Steinkraus

About 90 minutes east of the bustle of greater Chicago is the rural southwestern Michigan community of Cassopolis, within easy driving distance of South Bend and Elkhart, Indiana, and Kalamazoo, Michigan. This is where Dervin Witmer has built a thriving wastewater business that succeeds through diversity.

Witmer says that offering a wide range of services gives people more options and means they are more likely to become customers because Witmer and his team can provide what is needed.

That business idea has brought all the work he wants to Dig-It Excavating.

TAKING IT SLOW

Witmer is expanding his services, and taking on more work in Indiana, but he's doing it slowly because he doesn't want to overextend. Hydroexcavation is an example of where he wants to expand. He's doing it already with a 1996 Vactor 2100 carrying a 5-cubic-yard tank, and he is thinking about other opportunities and what he needs to justify the purchase of a newer hydroexcavator.

In 2018 Dig-It became licensed to pump in Indiana. Technicians were already doing service work there, so the pumping added more diversity.

The company does a lot of pumping. In 2019 Witmer added a second

◀ The Dig-It Excavating crew includes, from left, Lucian Witmer, Dervin Witmer, James Sanders and Joshua Sanders. They are shown with a Kenworth vacuum truck carrying Curry Supply tank and National Vacuum Equipment blower. (Photos by Lucian Witmer)

▶ Dervin Witmer and James Sanders are bedding pipe on a new sewer line before backfilling.

large vacuum truck and sold a smaller vacuum truck. Technicians do a lot of simple work, he says, repairing a crushed line, for example, or installing a riser or filter upgrade. Almost every day someone is out doing septic system inspections. There's emergency pumping for local municipalities with pump or maintenance problems. Dig-It's small crane truck, a Ford F-450 with a 3,000-pound Cobra 3300 crane, adds to service possibilities because it can lift 25 hp pumps.

The excavating part of the company name still comes into play for demolition, driveways and new construction work, but it's not the core of the business, Witmer says.

BREAKING IT DOWN

"We're starting to service large commercial systems. Even if another company installed a large system, and they don't offer maintenance, we will handle the maintenance contracts for that," he says.

Onsite work accounts for about 50% of the company's business, and it breaks down to about 25% new construction and 75% repairs. Residential jobs using standard septic tanks are about 75% of installations while 25% is advanced treatment units and commercial work.

Dig-It's move into Indiana will not be without competition.

"We're pretty new to that area, and there are a number of well-established companies there," Witmer says.

Aside from possibly needing more equipment, adding regular work in Indiana work would require hiring a couple more people.

Witmer runs his business now with full-time workers: Olivia Witmer, his daughter who manages the office and handles dispatching; Lucian Witmer, his older son, who drives one of the vacuum trucks and handles photography and aerial photography with a drone; and Joshua Sanders, who drives a vacuum truck and does most of the inspections. Part-timers are his son, Isaiah Witmer, who runs the service van, and youngest son Steffan Witmer, who is a helper. Foreman James Sanders oversees most installations. Witmer himself works in the field, manages the business and does estimating.



"If I have the equipment, then my guys know we can promote that service. I've never bought a piece of equipment and then said, I should never have bought this."

Dervin Witmer

WORKING ON WATER

The more interesting projects for Witmer are those using alternative technologies. For example, the lakes in his area, including Lake Michigan, have given him a chance to try out SludgeHammer equipment and fit drip irrigation into lake lots. Other alternative systems his company installs and maintain are from Aero-Tech and Singulair Green units from Norweco.



▲ Joshua Sanders rinses hoses after pumping a septic tank. Shown in the photos is a Crust Buster tank agitator and Kenworth truck built by Curry Supply and carrying a National Vacuum Equipment blower.



Dig-It Excavating Cassopolis, Michigan

- Owner:** Dervin Witmer
- Founded:** 2005
- Employees:** 5 full time, 2 part time
- Service area:** 40-mile radius from Cassopolis
- Services:** Onsite systems, residential and commercial; septic service and cleaning; crane truck services; hydrovac services for line cleaning; hydroexcavation; real estate inspections.
- Associations:** Michigan Septic Tank Association, Indiana Onsite Wastewater Professionals Association
- Website:** www.pumpthatseptic.com
www.dig-itexcavating.com

During the busy season, Dig-It installs one to two systems a week unless there's a big commercial job in hand. Those can require a month of work divided into a week here and a week there.

For installations, Dig-It technicians rely on two pieces of equipment: a Cat 310 excavator and a Cat 299 track loader. The excavator is two years old and has an Engcon EC209 Tiltrotator that can rotate a bucket (or other attachment) 360 degrees and tilt to a 45-degree angle, very good for working in tight spaces, Witmer says. A laser catcher on the excavator links to the Trimble Earthworks system to provide precise digging and cutting.

Witmer standardized Kenworth T880s for his big truck fleet. He has three. One is a 2015 dump truck with about a 20-yard box from J&J Truck Equipment in Somerset, Pennsylvania. Like the others it's a quad-axle.

The other two Kenworths are vacuum trucks. One is a 2015 with a 4,700-gallon steel tank from Curry Supply and carrying an NVE4310 blower from National Vacuum Equipment. (Dig-It designed and added custom-fabricated aluminum toolboxes and hose trays.) The other Kenworth is a 2018 with a 4,500-gallon Curry steel tank and the same NVE blower.

SMART EQUIPMENT

The T880 has a set-back front axle, and this brings two advantages, Witmer says. First, it shortens the wheelbase for better maneuverability. Second, because the engine sits forward, the front axle carries more engine weight. Under Michigan laws, having more weight on the steering axle increases the allowable payload on the rear axles. A companion benefit of the set-back axle is a sloped hood for better forward visibility.

Also in the inventory is the 2011 Ford F-450 service truck to carry the Cobra crane.

A 2016 Ford Transit cargo van handles drain cleaning and inspection services. It carries the RIDGID 6200 pipe roter and the RIDGID SeeSnake 63603 camera with a fiber optic self-leveling head and CS12X monitor,



◀ Dervin Witmer operates a Cat 310 excavator equipped with an Engcon tiltrotator as he clears brush to install a riser to an onsite system.

"I'm not living to become the next Jeff Bezos. I'm living to provide a professional service, and do it well, and have a good life doing it."

Dervin Witmer

and a RIDGID K9-306 FlexShaft drain cleaner.

When technicians need to move earth, they start up a 2012 Cat D5K2 LGP dozer.

"Sometimes a system might be 5 or 6 feet in the ground, so you don't get oxygen penetration," he says. Restoring such a system involves cutting away the surface with the dozer and then using an EarthBuster deep-soil decompactor.

A 50,000-pound AC3-25 trailer from Talbert in Indiana hauls equipment between job sites.

MAKING AN IMPRESSION

In a competitive area, publicity is a key business component, and for Dig-It this starts with the T880s. Showing up with identical, clean trucks gives Dig-It a professional image, Witmer says. His trucks are painted a base white and carry logos made by a local sign shop but designed by Witmer's brother-in-law Ben Bredeweg. He is a graphic artist who created and maintains the company websites.

About social media, Witmer has a system to minimize the time he spends keeping up with all the online demands. The system starts with everyone carrying a company iPhone.

"And I say, when you are on a job, I want you to take one to three pictures at day. Get the trucks; get somebody working; you've got a nice camera, and it doesn't take more than five seconds to snap a picture," he says.

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» James Sanders locates a line and septic tank using a RIDGID Navitrack Scout.

» Dervin Witmer cuts corrugated pipe to grade using a RIDGID cordless saw.



LAND THE JOB, THEN BUY THE EQUIPMENT

Dervin Witmer has been known to commit to a job before he adds equipment to the inventory of Dig-It Excavating, the company he owns in Cassopolis, Michigan. This is not as big a risk as it appears.

"I'm a cautious risk-taker," he says. "I take risks, and I like to take risks. And I like to sell stuff that I know we can do even though we're not fully equipped."

It's how the company began doing onsite system inspections, he says. A customer asked if he could offer the service, and Witmer said he could. Then he bought a camera to do it. He bought an EarthBuster drainfield restoration tool the same way: by selling a job first.

"I assess risk as: Here's the opportunity, I know the opportunity is going to come up again. If I have the equipment, then my guys know we can promote that service. I've never bought a piece of equipment and then said, I should never have bought this," he says. "Every time we bought something, it was to either expand our services or to make the services that we offer better."

He lives in southwestern Michigan, very close to the Indiana border, and it's a growing area.

"There's plenty of work here," he says. "What I look for is how can we be different from the competition? A lot of the guys in the area who are installers, that's all they are. We want to be the one-stop shop."

Having a variety of equipment gives him more options to meet a customer's needs. For example, when a system shows signs of failing, a homeowner may opt for the EarthBuster service to attempt rejuvenation before replacing the entire system.

"I'm an opportunist. How can we solve this guy's problem, and how can we make money doing it, and how can we provide a service that's a good value to our customers?" he says. "And how can we provide a smorgasbord of services so they say, 'OK, this guy isn't just trying to sell me a big, expensive system; he's actually giving me three different options.'"

"When you are on a job, I want you to take one to three pictures at day. Get the trucks; get somebody working; you've got a nice camera, and it doesn't take more than five seconds to snap a picture."

Dervin Witmer

At the end of the day, Witmer looks through the pictures and asks himself what customers need to know about the company's work that day. He uploads one to three pictures with simple comments. His Instagram account is linked to the Facebook, Twitter and Tumblr accounts, so posting on one updates the others automatically. Witmer says social media upkeep takes about 15 minutes out of his day.

Another part of Dig-It publicity is radio ads. One month he might talk about what not to flush into a septic system. For another month the topic might be real estate inspections. He drives to the radio company's studio, talks about ideas with advertising representatives, and spends about 30 minutes recording one ad. Last year he had a California company create a jingle.

continued »

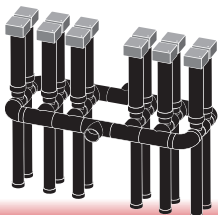
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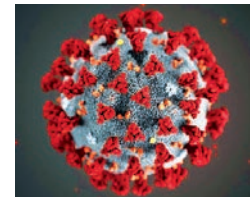


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« James Sanders spreads grass seed and straw after repairing a residential sewer line.

Check out an ad for Dig-It and Pump That Septic here: <https://youtu.be/l7Y3cy1ODls>.

“And we have had, in this last year and a half, so many people tell us, yeah, I heard you on the radio,” he says.

More importantly, the marketing produces business. “There’s a good percentage of people who have already decided they’re going to use us when they call us,” he says. They’ve watched a company video on YouTube, for example, and comment on it when they call. The best use of money right now is radio, social media, and just a few Google ads, he says.

A GREATER REACH

Publicity extends to the detail of having custom lids molded by Romo-Tech in New Paris, Indiana. Lids bear the company’s name, phone number and website, and technicians install them at every opportunity.

Witmer is looking ahead to other possibilities as well. There is a relatively new internet domain called .services, and when Witmer checked, he found the septic.services name was available, so he spent a few hundred dollars and secured it. He hasn’t worked out yet how to use the new domain, but he owns it and can take his time.

In fall 2020 Witmer made a big commitment to his company by breaking ground on a new shop and office structure of 9,600 square feet. “We’re growing, and (interest) rates are good,” he says. “And right now we work out of a pole barn at my house.”

The pole barn is only 1,920 square feet, and the office is in his house. He started on the new building in 2018 when he bought a 10-acre commercial site south of Cassopolis. During the next two years he added a driveway and did other site preparation.

The new building will have four truck bays, three for mechanical work and one for washing equipment. Inside will be offices, conference rooms and a lobby for visitors.

“It’ll just be nice to have more room,” Witmer says. “One of my guys, Jim Sanders, does some of our light mechanic work, and he’ll have a nice area for doing oil changes and brakes.”

The new shop will also help expand work in Indiana because it’s only a 15-minute drive from the border.

ENJOYING THE LIFE

At age 44, Witmer still has many working years ahead to build his business, except it’s pretty much grown to the extent he envisioned. There is still hydroexcavation, which he circles back to because it’s on his mind as a good service to provide.

“There’s a lot of infrastructure around here like electric and power. There’s some nuclear plants in the area by Lake Michigan,” he says. If he can find openings with those infrastructure companies, Witmer may commit to a \$500,000 hydroexcavator.

“It’s an employee and job and opportunity scenario that I haven’t figured out yet,” he says. “I don’t stay up at night saying, ‘I don’t have a nice hydrovac truck yet.’”

That’s because to him, growth is not and end in itself.

“I enjoy what I’m doing, and if I got too busy it would become stressful, and then it starts to control me,” he says. “I’m not living to become the next Jeff Bezos. I’m living to provide a professional service, and do it well, and have a good life doing it.” □

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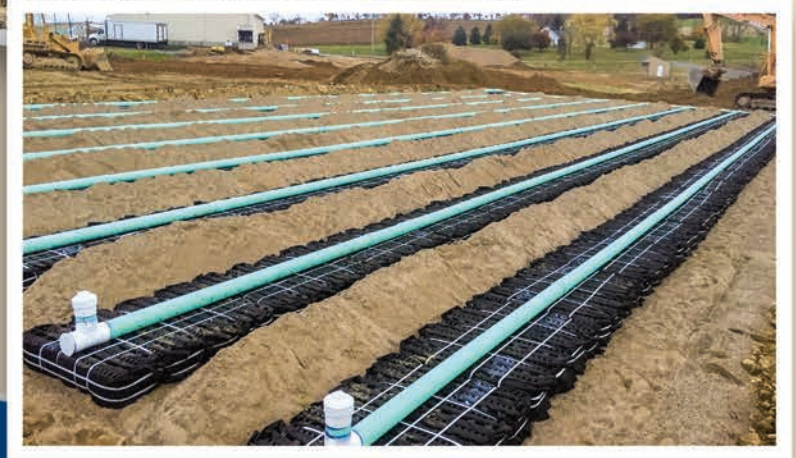
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Taking a Deep Dive Into Shallow Systems

Find the sweet spot for drainfield depth will ensure optimal treatment and a long life for your next installation

By Jim Anderson and Dave Gustafson

Recently we have received comments and questions about the advisability of hauling in additional soil fill over the top of soil treatment areas as part of landscaping projects. If you have read our columns in the past, you know one of our most-quoted design and installation principles is KISS, or Keep It Shallow S——. You can fill in the last word of the acronym.

The answer to the questions about whether additional cover can be applied is: “It depends.” It depends on the general landscape shape in the area, the original soil characteristics including texture, structure and permeability, current depth of the system, the media used in the treatment area (rock, chambers, etc.), and the depth to limiting soil layers like water tables, bedrock, slowly permeable or dense soil layers.

We thought it would be a good time to revisit some of the considerations for keeping systems shallow, and whether adding cover is a good idea.

Applying additional cover over a system after the fact should be approached with caution ... Research original soil and landscape characteristics, along with information about system media, to ensure the landscaping does not impact system performance.

One key to siting the soil treatment part of the system is to identify a location where water will not concentrate. Any additional surface or subsurface water can interfere with the ability of the soil to accept effluent. In the most extreme cases, the soil treatment area can be flooded or hydraulically overwhelmed.

WATCH DRAINAGE PATTERNS

Since systems are designed to accept several hundred gallons of water per day, any water added into the system through runoff is a large negative. It will be important to ensure the re-landscaping effort does not change the current drainage patterns to direct more water to the area of the system.

In general, the most permeable soil layers are located nearer the surface. This is due to increased levels of organic matter and better developed

soil structure in horizons closer to the surface. Permeability relates to both movement of water and air. Higher permeability means a better long-term acceptance rate (LTAR), which results in the having a smaller-sized area and a better environment for the aerobic organisms in soil we rely on to provide treatment of effluent.

As a system is installed deeper, the LTAR is reduced, requiring a larger system. There is less oxygen exchange because it is more difficult to move air between the atmosphere and the soil around and under the sewage treatment trenches. It's kind of a double whammy where soil structure is less desirable and the ability of the soil to accept effluent is less, but with less oxygen available, the biomat will tend to be thicker and more resistant. This further reduces the ability of the soil to accept effluent.

One other key to proper acceptance and treatment of septic tank effluent is the separation distance from the infiltrative surface to limiting soil condition. This can be depth to watert able, depth to bedrock or dense, slowly permeable soil layers. The 3-foot recommended separation distance from these conditions to be adequate depends on having enough oxygen available to keep the biomat from becoming too thick.

If the system has already been installed deep, additional cover over the top will reduce further oxygen exchange. Even though the permeability characteristics of the soil may be good, the exchange may not be adequate to provide necessary oxygen. The result is lowered treatment efficiency and lower acceptance which may result in system failure.

THE 4-FOOT RULE

For these reasons, our general guidelines for system installation is to have a maximum excavation depth of 4 feet. Of course, there is nothing magic about 4 feet, but it is based on the permeability issues above plus deeper excavations will bring the system closer to one of those limiting soil conditions that may further impact the ability of system to accept effluent.

Given the fact landscaping around the system often occurs after system installation, the total depth of cover should never exceed 7 feet. This would be an absolute maximum and we never like to see this much cover. Keeping total cover to 4 feet or less is more desirable.

We are often asked how much of the effluent acceptance is through evapotranspiration versus downward through the soil. Evidence that evapotranspiration is a factor is indicated by the greener, lush-growing grass over the top of a system where the trenches are installed shallow.

A few studies have found that where systems are installed 4 feet or less in depth, 20 to 40 % of effluent evaporates. Of course, we design for all of it to move downward, but the deeper the system the less evapotranspiration, putting more pressure on the system to move all the effluent through the infiltrative surface.

One final issue to keep in mind: It is one thing to add cover to a system where the trench media is rock versus chambers or other media. We have seen numerous examples where the depth of soil cover has exceeded the strength of the other media, causing premature failure due to deformation and soil subsequently filling in the trenches. If you are adding cover after the fact, it is important to know the maximum allowable cover for the media installed and the actual depth of excavation.

For us, the bottom line is that applying additional cover over a system after the fact should be approached with caution. Before proceeding, research original soil and landscape characteristics, along with information about system media, to ensure the landscaping does not impact system performance. ▣

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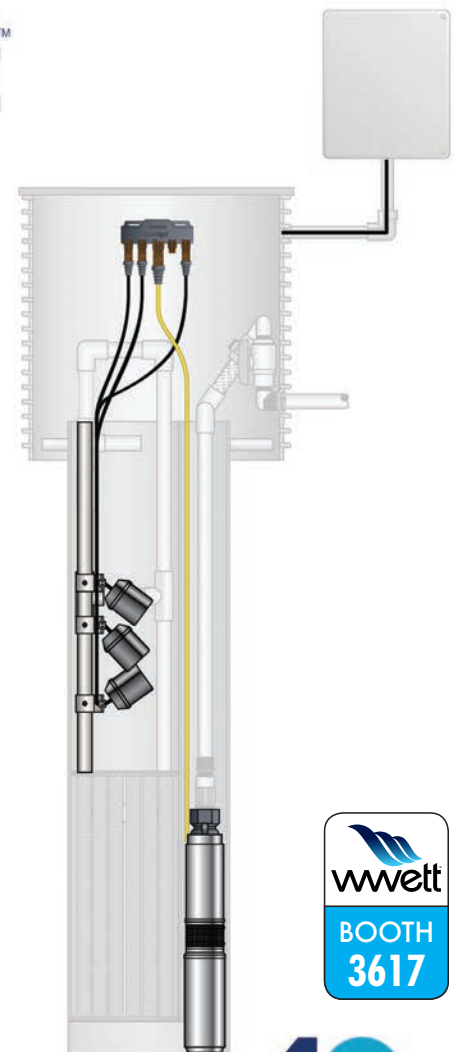
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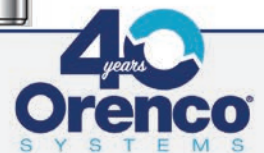
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SYSTEM PROFILE



« Landscaping shown at top covers the treatment tanks and camouflages the panels and blower housing for the BioMicrobics MBR. The fence at right marks the border of the yard next to the street. (Photos courtesy of A-Advanced Septic)

When the Driveway Is the Only Place to Put a Drainfield

Greeted with a postage stamp-sized lot and a 4,000-square foot lake home, Washington state onsite professionals dig in to find a winning solution

By David Steinkraus

Originally built in 1977, the house on Lake Tapps, 36 miles south of Seattle, had started as a small dwelling that previous owners expanded to about 4,000 square feet.

“You’re talking about a million-dollar house on the lake, and they had not given a lot of thought to the septic system,” says Keith Pelzel of Westside Septic Design, who created a solution to a new owner’s problem. The problem was effluent surfacing from a failing onsite system installed without a permit by someone working for the previous owner.

Aside from a relatively small lot, Pelzel confronted two added challenges: a steep slope dropping about 30 feet to the lakeshore and not suit-

able for a drainfield, and a house, garage and driveway that took up most of the remaining space.

Pelzel used a BioMicrobics BioBarrier membrane bioreactor combined with Infiltrator chambers. He also designed an unusual solution for the drainfield. It didn’t meet state code, but after three to four months of meetings, the project received a variance.

SYSTEM FLOW

Wastewater flows out of the house through a 4-inch Schedule 40 pipe. Technicians from A-Advanced Septic decommissioned the old pump tank

» Because the drainfield could fit only under the driveway, it was formed with Infiltrator traffic-rated H-20 chambers. The street serving the house is immediately to the right and tops of treatment tanks are visible in the background near the fence.



and repurposed the old septic tank into a pump tank. Both are located at the top of the slope.

The old septic tank was waterproofed, and technicians added a Hydromatic SP 40 pump. From this pump tank, water moves on demand through 79 feet of 1 1/2-inch Schedule 40 pipe to the back of the lot and into a two-compartment 1,500-gallon concrete tank from Northwest Cascade.

The first compartment is 500 gallons and settles solids. A BioMicrobics SaniTEE SNT 416 filter separates the compartments. In the second compartment is the BioMicrobics MBR. The MBR sends water to a 1,500-gallon pump tank, also from Northwest Cascade. Another Hydromatic SP40 pushes water through 9 feet of 1 1/4-inch Schedule 40 pipe to the drainfield. A manifold distributes effluent into 270 feet of 1 1/4-inch Schedule 40 pipe divided into 12 laterals and with 3/16-inch holes drilled on 3-foot centers on each lateral. Laterals are covered by Infiltrator H20 (traffic-rated) stormwater chambers.

A BioMicrobics panel runs the MBR, and a SJE Rhombus IFS panel handles the drainfield. Dosing for the drainfield is set at six times per day at 60 gallons per dose.

Risers and lids were UltraRib (Orenco Systems).

The one piece of heavy equipment that A-Advanced Septic used to put the system in was a Kubota 40 Series mini-excavator.

Faux rocks in the landscaping conceal the tank lids. The artificial rocks are still heavy and hard to move, and it makes maintenance more difficult, but the owner was willing to pay the extra cost for service, says Andrew Gunia, who owns A-Advanced Septic.

DRAINFIELD OPTION

In such a tight space, the only place for the drainfield was under the driveway for the two-car garage.

“In Washington state you’re not allowed to put drainfields under driving,” Pelzel says. “But I did not have anywhere else to go, and none of the neighbors had any room. I would have loved for him to have gotten an easement. We tried that.”

“So you either take a million-dollar house and say it’s unlivable, or you come up with a plan that the Health Department will sign off on,” he says.

System Profile

Location:	Lake Tapps, Washington
Facility served:	Private home
Designer:	Keith Pelzel, Westside Septic Design LLC, Tacoma, Washington
Installer:	A-Advanced Septic Services, Sumner, Washington
Type of system:	BioMicrobics BioBarrier MBR
Site conditions:	24 inches loamy fine sand
Hydraulic capacity:	360 gpd

SYSTEM PROFILE



On top of the drainfield Pelzel specified a new slab with lengths of No. 5 rebar spaced 2 feet apart.

“I didn’t want the driveway to sink and crush any of the laterals,” he says. “You’re basically building a bridge over the top of the drainfield even though the driveway is sitting on dirt.”

The old system was bootlegged in without a permit and by someone who may or may not have known what they were doing, Pelzel says. “I’m going to guess they didn’t know what they were doing because of the material that came out of it — corrugated ABS pipe, which is not permitted in Washington state for drainfields.”

“I didn’t want the driveway to sink and crush any of the laterals. You’re basically building a bridge over the top of the drainfield even though the driveway is sitting on dirt.”

Keith Pelzel

STAGED CONSTRUCTION

Installation of the system itself posed its own challenges. The waterline to the house had to be sleeved because it came within 10 feet of the onsite system components.

Construction had to be carefully staged, he says, because the lot was so tight that technicians had nowhere to pile dirt. Work on each stage was coordinated with Pelzel and county inspectors so they could see each part of the system before it was covered, Gunia says.

The owner and his family never had to vacate the home, he says. They

◀◀ To protect the drainfield, designer Keith Pelzel specified a new driveway slab with rebar spaced every 2 feet. This essentially created a bridge over the drainfield.

▼ A technician from a concrete company finishes the driveway slab at the Lake Tapps house. The panels and blower housing are visible at right.



agreed to minimize their use of water during the four days of construction, and for that time the old septic tank became a holding tank.

Another wrinkle emerged after the system was in. The owner is Asian and his family cooks traditional Asian food. He bought vinegar by the case, Gunia says. In addition, the owner used the same cleaning service for his house that he did for his business, and that company used the same commercial-strength chemicals for the house.

All of this combined to create a caustic effluent that damaged microbes and in the MBR, causing issues, Gunia says. Education solved the problem, he says. Excess vinegar now goes into a bottle and into the trash, instead of down the drain, and the owner hired a different cleaning company. Since then, the system has functioned normally and needed only standard maintenance.

PEOPLE PROBLEM

The other quirk of the project involved the bootleg system. As the project became more complicated, such as reworking the driveway to accommodate the drainfield, costs increased. What started as a \$65,000 project was looking like a \$95,000 project as it went on, Gunia says. (Final cost was just over \$100,000.) That was a lot for the owner to swallow and Gunia, as a disinterested person, volunteered to call the previous owner and see whether he could work out some payment toward the new system.

Gunia says he started the conversation by telling the previous owner that he had apparently been misled by people in the industry. But, Gunia added, the bootleg repair showed that the previous owner knew there was a



▲ The Lake Tapps property was large, but the house consumed most of the width. Technicians had only a few feet to work with and had to stage construction because there was no extra space for piling dirt. The rocks in the foreground are artificial and conceal the tank lids.

problem, and a neighbor confirmed the bootleg system was installed just before the sale.

“I said, ‘Look, I’ve been here before as a professional witness, and I can tell you how this plays out,’” Gunia says. Everyone hires lawyers, the case goes to arbitration, and the arbitrator works to have everyone meet in the middle. The best outcome, Gunia told the previous owner, is that he would pay half the cost of the new system plus \$30,000 or \$40,000 in fees for his attorney. Worst case, Gunia told him, is that he would be ordered to pay the full cost of the new system, plus the new owner’s attorney fees, plus his own attorney fees.

“I said, ‘So why don’t we cut to the chase, leave the attorneys out of it, and you agree to pay for half now,’” Gunia says. “The next day he calls back, and he says, ‘You know, I think we’ll take you up on that opportunity.’” □

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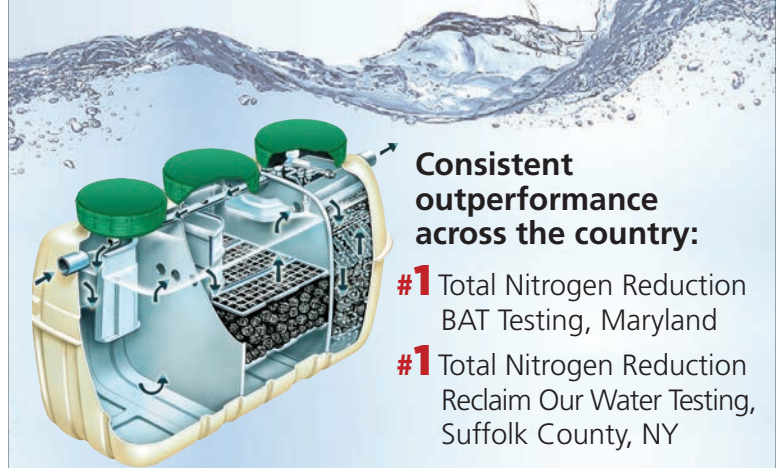
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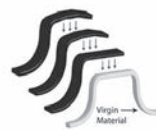
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Texas Wastewater Pros Seek Effective Balance of Industry Regulations

A serious approach to rules and a boost in professionalism are on the top of the list for gaining more respect for Lone Star State pumpers and installers

Compiled by Betty Dageforde

In Snapshot, we talk to a member of a state, provincial or national trade association in the decentralized wastewater industry. This time we visit a member of the Texas On-Site Wastewater Association.



Vonda (Sissy) Bob
 chief financial officer
 and office administrator

Business:
 South Texas Aerobics,
 Caldwell, Texas

Age: 50

Services we offer:
 Pumping, installation,
 inspections, repairs,
 tank sales

Years in the industry:
 20 years

Association involvement:

I am currently serving on the Texas On-Site Wastewater Association (TOWA) board as co-chair of the enforcement committee and chair of the scholarship committee. I also am chair of our local Brazos Valley Chapter of TOWA.

Benefits of belonging to the association:

I really enjoy being able to help people. We have installers who need help with disputes with a permitting authority and authorities who need help with a homeowner or with installer-maintenance provider issues. Being on the TOWA board helps me stay on top of the latest rule changes so I can share this information where it needs to go.

Biggest issue facing your association right now:

Finding the delicate balance between not enough regulation and too much regulation. I have found that when you deal with different people,

locations and situations, they may look similar on the surface but one rule will not be what is right or the best solution for the problem. A rule is a rule, but local authorized agents are given the option to enhance what is written so they can apply it in a more specific way that meets the need in their area. Sometimes this is a benefit and sometimes a hindrance, so best judgement is what I will normally advocate.

Our crew includes:

My husband and co-owner Al handles all our installs, pumping and tank deliveries. Our son Eric, who helps to pour tanks, handles all the service calls and inspections and most of the time will do the final inspections with the counties. Daughter Megan is our administrative assistant.

Typical day on the job:

I open the office at 7:30 a.m. and begin by scheduling the day for both Al and Eric, assigning where they will be working for the day and what is required for them to do their jobs. I handle all the paperwork, permitting, scheduling, inventory, job preparation, filing, job bids, customer interaction and will usually take lunch to the job site while out picking up materials or going to different counties to file for Authorization to Construct. I also help with installs occasionally to stay on top of how they put the systems in so that when a customer calls with a question I can answer it intelligently and help them feel more at ease about something the average person has very little experience with.

The job I'll never forget:

We were installing a three-tank aerobic unit in the side of a hill with a 45-degree slope and had to “bunny hop” the tanks up the hill one at a time to get them in. Several installers had already looked at the job and told the builder to call us because Al would be the best person to handle such a difficult site. We are going on 12 years working for that builder now and have done several more jobs for him that have required “special” practices to put them in.

My favorite piece of equipment:

That would definitely be my computers. I keep two desktops and four monitors active so that all my programs can be active at the same time. I have a maintenance tracking program and a scheduling and notification program that also tracks my tech out in the field so I know where he is in case of emergency calls. My email and my accounting software are always



◀◀ The truck fleet includes, from left, 2015 Chevy Express van; 2011 Chevy ¾-ton HD; 1996 Ford F-250; 2013 Chevy 3500HD; 2002 Freightliner FL-70 with a 2,600-gallon tank built by Al Bob, a former welder; 2015 Kenworth with 540 Fassi knuckle boom crane; and a 2020 Case 590 Super N extend-a-hoe backhoe.

▼ Ryan Gerlich from Texas A&M University observes as Al Bob in a Kubota KX71 compact excavator installs Clearstream fiberglass tanks at the RELIS campus.

open. I have always found it to be a little frustrating to have to toggle between screens. And since I do a lot of my work online or with fillable documents, this saves me time. I can be opening a ticket with Texas 811 (“Call before you dig”) while sending in a contract to a county or replying to a customer’s email.

Most challenging site I’ve worked on:

We installed an aerobic drip system on a site that was basically a rock hill. The area where the house sits had to be jackhammered out and three 15-foot retaining walls, 60 feet long and 24 inches deep had to be installed behind the house. A pool was also installed in the backyard and a three-car garage in the front. By the time we were called to the site, a drip was the only option. The levels of the retaining walls each have three to five lines of drip running the length of them, and every other square inch of the property that was not already concrete is drip area. We used our mini-excavator to keep the trencher from falling off the side of the hill while trenching lines. It’s a one-of-a-kind install and a very happy customer allows us to have people out to show the system.

Oops, I wish I could take this one back:

I was approached by someone to do an install for (a major railroad company) on the new rail yard. I quickly found out that working with an entity this large was a pain in the neck. Certain parts of the job that impacted an onsite system had already been done to Michigan code and explaining to the powers that be that it would not pass inspection here in Texas was frustrating. I was at the point of walking away from the job myself when (the company) decided not to complete the project. Lesson learned. I was out time but luckily nothing else, and I don’t think I will waste my time with a corporate entity such as this again. I have plenty of work from people who know I will guide them in the right direction for their job and site.

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

A customer in a community where every home was over a half-million dollars asked me if they would get a discount on their renewal contract because we serviced several of their neighbors in the same subdivision. I immediately asked if I got a discount on my physicals (he is a doctor) as he had more than one patient. Yes, they found a new maintenance provider and I am okay with that. Still cracks me up.



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

This is a hot topic for me. It has to do with homeowner maintenance. In our company, we hire out a registered sanitarian to do all our site/soil evaluations, not because we would not be competent at doing them — we do give suggestions because we dig these holes every day — but because it is a second opinion that is independent. We know that by having a registered sanitarian go out and meet the property owner, he/she will discuss the options available to them and help the customer decide what works for them and their site. I believe maintenance should be done by an independent person who does not have a direct stake in the functioning of the system. We are not allowed to inspect and DOT-certify our trucks, and we are not allowed to notarize our own affidavits. We are trained not by taking a class but by performing this type of work eight to 10 hours a day six days a week. I understand there could be extenuating circumstances necessitating someone doing their own service, but even then there should be a yearly follow up by an industry professional to make sure everything is working as it should be and there’s no risk to the safety of anyone downstream.

Best piece of small business advice I’ve heard:

A customer told me to raise my prices and weed out the high-demand people that do not appreciate what we do. We have been very lucky here

SNAPSHOT

» Megan, Al, Vonda and Eric Bob with dog Sassy

since we form personal relationships with almost all of our customers. We do a homeowner walk-through with all new installs. Literally over a thousand people have my cell phone number. It's rare for us to lose a customer for any other reason than they are looking for someone cheaper or one or two from personality conflicts. We mainly operate in a high home turnover area because it's a college town and when we have an owner move out they almost always leave word for the new owners on which contractors to keep for services. Treating your customers with respect will earn their respect in return. They are not just a dollar sign.

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

Become a dive instructor in the tropics. I have been scuba diving for the past five years and have been working on my certifications. My daughter and I have attained instructor level so now I can teach others to dive. Not only do I enjoy the outdoors but it fills my need to be helpful. I have always tried to be environmentally responsible and enjoy showing others ways they can help too. Plus traveling to exotic places to dive has enabled me to see parts of the world I probably would not have been able to see otherwise.



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

I would like to see more professionalism in the industry. Throughout history it has been well documented that the pathogens in wastewater cause all types of diseases for humans and animals alike. As our population grows, the available area for treatment and disinfection, if needed, has been reduced. Add to this the more resistant strains that have developed over the last century and we may be in trouble in the future. As anyone in the industry can tell you, "It all goes downstream." It's up to us to make sure that proper installation and maintenance procedures are followed to protect our neighbors downstream. After all, we are all downstream ourselves. How much faith do you put in your neighbor? □

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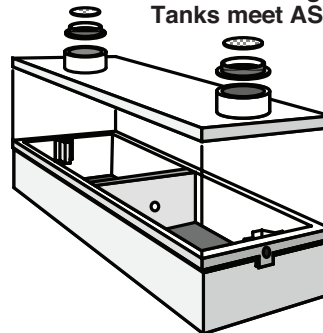
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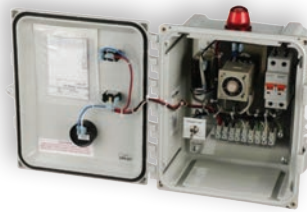
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New York County Says Water District Would Aid Onsite System Fixes

By David Steinkraus

Suffolk County, New York, is planning to establish a countywide water management district to aid in the fight against bacterial contamination of its Atlantic Ocean shoreline.

The county occupies the eastern end of Long Island and has worked for years to counter problems from the approximately 360,000 cesspools used for onsite wastewater treatment.

What the management district will do, said County Executive Steve Bellone in a press release, is enable repair of the county's water infrastructure. It will do this by creating a structure to implement the county's long-term water quality plan, expand financial assistance to homeowners, and serve as a way to invest in new systems and advanced wastewater treatment.

The long-term water quality plan calls for investing \$4 billion over 50 years to reduce nitrogen by adding municipal sewer service to some properties and installing nitrogen-removing onsite units on parcels where municipal service is uneconomical.

In 2017, the county established a grant program to help property owners with the cost of advanced onsite equipment. Voters approved a tax for the grants, and the state later contributed \$10 million.

The county and several of its townships and cities have changed their wastewater treatment laws in the past few years to forbid any new cesspools and require advanced, nitrogen-removing onsite units for any new construction or expansions of existing buildings.

* * *

New York's Warren County is considering a law to require onsite system inspections when a property is transferred. The county covers most of western shore of Lake George and its southern end. In recent years the lake has been clouded by large algae blooms.

The law would apply to all onsite systems within 250 feet of a specific list of water bodies, and there would be a provision for any municipality to opt out. Some communities in the county passed their own laws about inspections.

* * *

The water and sewer commission in Glens Falls levied a \$3,000 fine against IBS Septic & Drain Service for dumping a large quantity of cooking oil and grease into the city's wastewater treatment plant in February.

Security cameras showed IBS was the only septage hauler to dump at the plant that day, reported *The Post-Star of Glens Falls*. It appears IBS sent a truck that either had not been fully emptied or not cleaned out, said Steve Gurzler, the city's engineer. He said the company acknowledged its mistake and sent another truck to help clean up.

California

Marin County plans a pilot project to create 22 apartments in Bolinas by upgrading home onsite systems.

The project to create what are known as in-law or grandmother apartments is a partnership between the Bolinas Community Land Trust and Bolinas Community Public Utility District, reported the *Marin Independent Journal*.

Under the class I standard for new construction, there must be a 3-foot separation between groundwater and a drainfield. County supervisors waived that requirement and imposed the class II standard that allows only 2 feet of separation. Systems in this standard use a pre-treatment tank and peat moss biofilter before discharging to a gravel and sand drainfield.

Twenty of the homes in the project will need system upgrades to reach class II. The other two already have class II systems.

Because of water shortages in the area, the city has had a moratorium on water permits since 1971. This has largely prevented the construction of new housing.

Marin County is immediately north of San Francisco on the other side of the Golden Gate.

Delaware

In 2018, New Castle County imposed a temporary moratorium on the use of septic tanks in subdivisions. Now the county is likely to indefinitely ban large developments that use septic systems.

The temporary moratorium ends in August, but Delaware Public Media reports the county will consider indefinite extension of the ban later this year. Most of the effect will be felt in the southern part of the county where officials want no more than five parcels in any subdivision created on agricultural land. Some landowners objected to the moratorium in the past, saying it will reduce their ability to sell their land.

New Castle County covers the western shore of the Delaware River where it empties into Delaware Bay.

Florida

Wakulla County, on the Gulf Coast just south of Tallahassee, recently received \$577,500 from the state for a septic system upgrade program.

Under the program, certified installers or licensed plumbers may receive up to \$7,000 for installing nitrogen-removing onsite systems in certain areas of the county. Costs in excess of \$7,000 are the responsibility of the property owner.

Arkansas

The Bella Vista City Council decided to table an ordinance about septic system size requirements in order to do further research.

Undersized systems are a problem, said Doug Tapp, Community Development Services director, but there is no way to prevent it. At the moment, the department must accept builders' assurances that an onsite system is adequately sized, reported the *Northwest Arkansas Democrat Gazette*.

The tabled ordinance would require a system suitable for two people in a structure of 1,500 square feet or smaller. A system for three people would be mandated for a structure of 1,500 to 2,500 square feet, and a four-person system for structures of 2,500 to 3,500 square feet. Larger systems would be required for any structure of more than 3,500 square feet.

Bella Vista is near the northwestern corner of the state.

Texas

Oil and gas wastewater discharges into public waters will now be overseen by the Texas Commission on Environmental Quality. The U.S. Environmental Protection Agency shifted authority for permits under the National Pollutant Discharge Elimination System to TCEQ in January after Texas requested it.

Any discharge into a pond on leased land will still be regulated by the state Railroad Commission. Standards for discharges remain the same, Jeremy Hagen, general counsel with the Railroad Commission, told the *Midland Reporter-Telegram*.

Oil and gas operations annually produce millions of gallons of wastewater. Instead of injecting that wastewater into wells, operators could now be allowed to discharge treated wastewater into creeks or lakes to expand the water supply for municipalities and agriculture, Hagen said.



"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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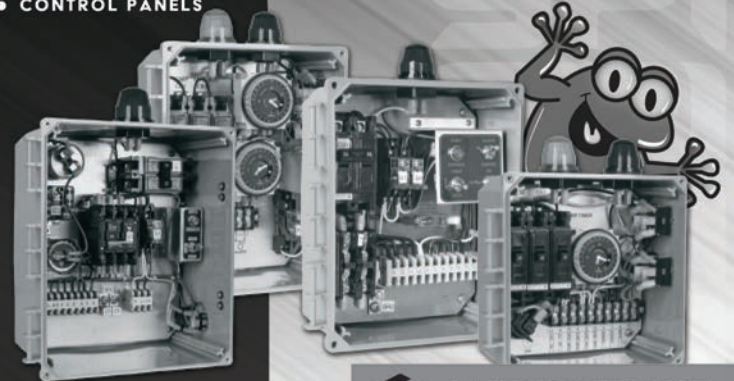
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PRODUCT NEWS

PRODUCT SPOTLIGHT



Septic vent filter alerts septic system owners when it's time to replace carbon

By Craig Mandli

As a septic service and onsite system installer, you no doubt have dealt with customer complaints of septic and sewer odor. If those customers have standard plumbing vent stacks, odor can sometimes be a problem depending upon the home and property topography.

To combat the issue, Industrial Odor Control, a Simple Solutions Company, offers a line of products that specialize in removing offensive odors with carbon vent filters. The activated charcoal vent filters work to eliminate hydrogen sulfide as it is released from airstreams and vents. Units are available that filter 3 to 2,700 cubic feet of air per minute. In addition to capturing hydrogen sulfide, they also remove diamines, ammonia, terpenes and other organic sulfides from the air.

The company recently released an upgrade to its line of filters to include an end of service life indicator that alerts users when the carbon inside is saturated and needs to be replaced. The company's line of residential and light industrial odor filters now come standard with this improvement. The models that include the ESLI are the Heavy Duty (HD), WVI (Inline), LRF (Linear Roof Filter), and SWV (Super Wolverine).

According to Andrew McGibbon, president of Simple Solutions Distributing, the life of a filter is based upon the volume of air and the concentration of the hydrogen sulfide in that air stream. If you don't have those two variables, you cannot calculate exactly when the filter will suffer breakthrough. Homeowners, and most professionals, do not have the equipment necessary to test for those exact numbers.

"While we cannot give them a precise answer without knowing the airflow and concentration, we can provide them with something that will give them advance warning of pending breakthrough" McGibbon says.

The indicator is a small button on the side of the filter. It is a qualitative (yes/no) colorimetric indicator for the end-of-service life of carbon adsorbers and filters and will change colors when the carbon has become saturated. It is designed to provide real-time indication of the breakthrough of hydrogen sulfide gas. Water has no effect on the breakthrough indicator. 866-667-8465; www.industrialodorcontrol.com □

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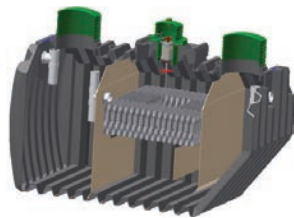
Septic Tanks and Components

By Craig Mandli

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The PuraACE from Anua is a drop-in-tank reactor pod for treating high-strength waste from restaurants, convenience stores or other facilities. The pods can be added to existing residential or commercial treatment systems that are overloaded. Treatment occurs by a submerged aerated filter process to reduce BOD, COD and ammonia. Built-in passive alkalinity control regulates pH without chemical addition. The pod housing isolates aeration to keep the heavy solids from mixing. The open channel media prevents clogging while the airlift recirculation enhances retention time. Multiple reactor pods can be utilized for larger flows and loads. 336-547-9338; www.anuainternational.com



BioMicrobics SaniTEE

The SaniTEE from BioMicrobics is designed to be an efficient, nonclog effluent screen that deflects solids back into a tank while simultaneously attenuating surge flow. It drops into a standard 4-inch septic tank (for new builds or retrofitted) outlet tee. It is easily cleaned with the CIP (clean-in-place) swab handle with a Buna-N disk fastened to the shaft. To clean, move the swab handle up and down to pass the swab through the center several times to act as a reverse pump to dislodge any debris in the filter or angled slots. No removal or running water is necessary. Solids touching the vertical surface of the screen tend to slough off and fall back into the septic tank. In this way, the device is somewhat self-cleaning. In general, the 4-, 8- and 16-inch device should be for use on conventional and advanced septic systems; and is suitable for all types of commercial (high-strength) wastewater treatment systems. 800-753-3278; www.biomicrobics.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 and 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



Polylok PL-250

The PL-250 from Polylok can be installed in any 360-degree configuration without any chance of direct bypass. Its design of 250 feet of 1/16-inch filtration will handle flows up to 3,000 gpd. The cartridge is built in a distinctive W-design that will fit a 6-inch tee. It fits on a 4-inch outlet pipe and accepts 1-inch PVC pipe of any length that can be used with or without a 1-inch filter handle to accommodate tanks buried at various depths. The built-in gas deflector deflects suspended solids and stops particles from leaving the septic tank by preventing gas bubbles from rising and carrying tiny solid particles out of the exit port into the leachfield. Installation on the gas deflector simply involves snapping the tee into place and no tools are required. It is certified to NSF/ANSI Standard 46. 888-765-9565; www.polylok.com



Sim/Tech Filter pleated filter units

Pleated filter units from Sim/Tech Filter provide gravity effluent filtration in septic tanks and turbine pump filtration in pump tanks. The filtration size is 3/32 inch in two dimensions. Flow channels in the pleated material increase longevity. All filter types start at over 2,000 square inches of filtration area. The 45% open area (over 900 square inches) is equivalent to 800 linear feet of 3/32-inch slots. Various configurations and larger units are available. 888-999-3290; www.simtechfilter.com



LIDS

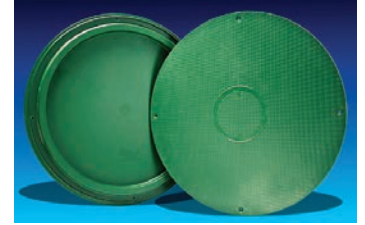
BrenLin Seal-R

Seal-R septic tank lids from BrenLin create a strong seal between the septic tank and the riser, eliminating water infiltration between the tank and riser. They are made of durable materials, range from 12 to 42 inches and can be personalized with a service provider's company information. The 42-inch lid meets growing demand for bigger risers to accommodate new technology. 888-606-1998; www.seal-r.com



Orenco Systems DuraFiber Lids

Orenco Systems 24-inch DuraFiber Lids are made of resin-infused fiberglass fabrics for durability and damage resistance, with breaking strengths in excess of 20,000 pounds. They fit most ribbed PVC and HDPE riser pipe and weigh only 11 pounds. Lids have a flat-style flange, allowing flush-to-grade installation; a cored centering ring, providing an easily aligned, snug fit; and a urethane gasket, helping form a watertight seal. Lids include four 5/16-inch stainless steel flathead screws and a hex wrench. Optional insulation (2 or 4 inch) is available, which can be preinstalled at the factory or installed on site with a hardware kit. The lids have a nonskid surface with customizable center insert (for logos, etc.), along with a molded-in caution statement. 800-348-9843; www.orenco.com



RISERS

Aero-Stream Integral Safety Barrier

The Integral Safety Barrier from Aero-Stream provides added protection from an incidental security breach of the primary septic tank cover. It is included on all Aero-Stream risers and available in heights from 7 to 50 inches in 3-inch increments, with custom heights available up to 96 inches. Its modular design minimizes freight cost and allows 33 unique configurations with 10 SKUs. The tank can be pumped without removal, but the unit can be removed for servicing baffles. It fits 24-inch I.D. double-wall corrugated, ribbed and smooth-wall pipe. The adapter flange is 29 1/2 by 29 1/2 inches, with a 23 1/2-inch I.D. 877-254-7093; www.aero-stream.com.



TUF-TITE tank risers

Tank risers from TUF-TITE have internal supports or ledges to reinforce internal plastic safety lids. The ledges will strengthen the company's plastic internal safety lids or a variety of internal safety devices made by others, such as concrete, fiberglass or rope netting. The riser lids come with the necessary mounting hardware, including safety screws. 800-382-7009; www.tuf-tite.com



VENT PIPE FILTER

Pagoda Vent

Vent pipe filters from Pagoda Vent provide septic field microbes with the oxygen they need to thrive. They give concrete tanks gas release to mitigate microbial-induced corrosion and also provide pressure relief for pumps. They provide proper ventilation, while remaining inconspicuous and attractive in the landscape. The premade units are durable, lightweight and will not rust. They encourage a healthy subsurface environment, release gases, and help preserve concrete tanks. An optional odor filter cartridge using a specialized concentrated media offers years of lasting odor control and fits concealed in the device, according to the maker. 888-864-1468; www.pagodavent.com □



Septic Tanks and Components

By Craig Mandli

Septic tanks key to island system installation



Problem: On Farm Island, north of Minneapolis, most installation work stops during the winter. When Septic Check was asked to design and install a septic system for a 1,400-square-foot, year-round dwelling, they took an unusual step by waiting for winter to enable transporting project materials on a trailer over the frozen lake to the remote island site via a 3,400-foot-long snowplowed road across the ice.

Solution: A tank-based advanced treatment unit system was selected to meet Minnesota regulations requiring a 3-foot minimum separation between a conventional system drainfield and the water table. The system with a UV lamp reduced the required separation to 1 foot. Wastewater exits the house via 12 feet of PVC pipe to the first of three **Infiltrator IM-1060** 1,000-gallon tanks, where settling and anaerobic treatment occurs. Wastewater then flows by gravity into the second tank where a Delta ECOPOD E50 ATU provides aerobic processing. It leaves the ECOPOD and flows by gravity through a SALCOR UV light to the last tank and is then pumped 65 feet through a 2-inch pipe to a 585-square-foot absorption field.

Result: To prevent the soil from freezing prior to the March installation, the site was covered with frost blankets. Equipment and supplies were driven across the frozen lake and technicians commuted by snowmobile. An auger was used regularly to check the thickness and quality of the ice and ensure safety. The installation went smoothly. Daily clearing of all dirt piles to prevent overnight freezing was one of the hardest challenges. 800-221-4436; www.infiltratorwater.com

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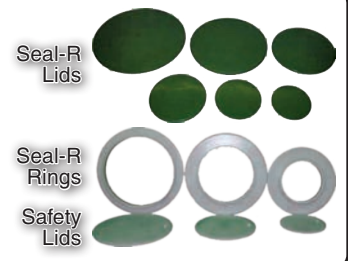
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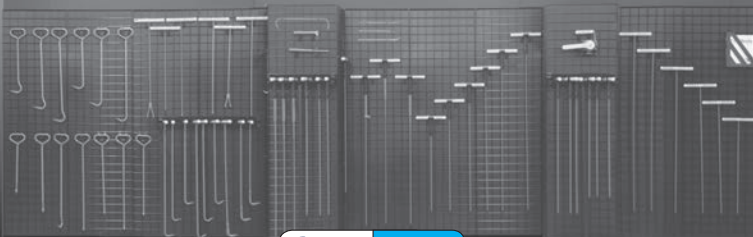


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