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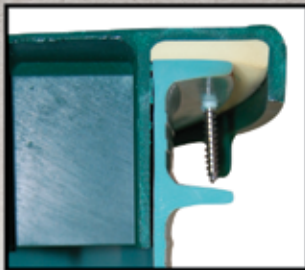
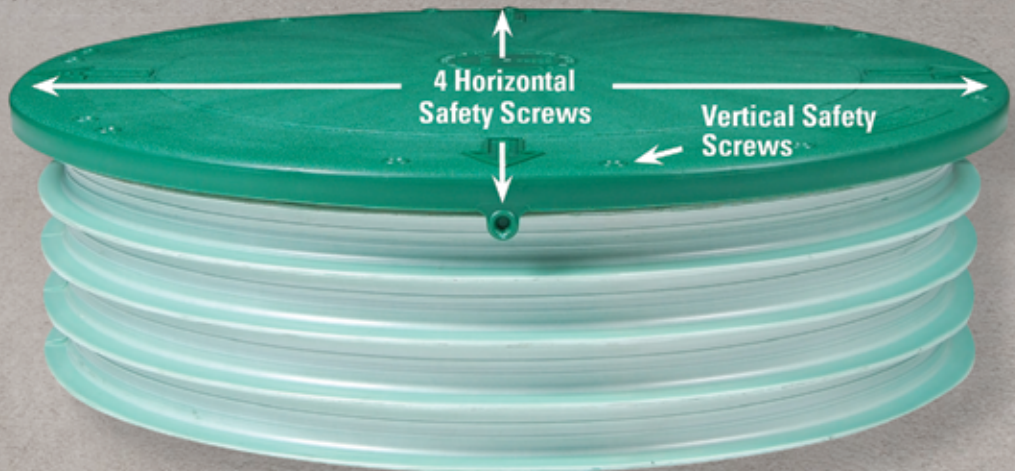


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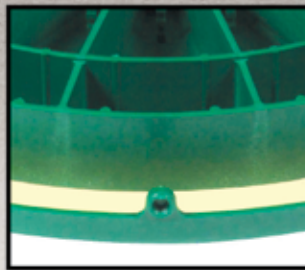
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CUSTOM COVER:

The Ecoflo linear biofilter is designed for faster assembly, lower commissioning costs and dependable performance by reducing the amount of pipes and eliminating the need for C33 sand. All hard components are reusable, lightweight and made from recycled plastic. (Photo provided by Ecoflo)

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Coming Next Month

ISSUE FOCUS: Large-Scale and Commercial Treatment Systems

Snapshot: What's new in Washington State?

Contractor Profile: Common sense solutions in North Dakota

The Ecoflo Linear Biofilter: Eco Design That Reinvents Combined Treatment and Dispersal

Eco design goes beyond using recycled plastics. It's about innovating products that find ways to reduce its global environmental impact while creating added value for installers and homeowners. As a result of its eco design, the Ecoflo linear biofilter achieves faster assembly, lower commissioning costs and superior long-term results by reducing the amount of pipes and opening up new sand options.

Combined treatment and dispersal systems are recognized throughout the industry as solutions that are reliable, flexible and simple to work with. But as much as we like them, they aren't perfect. Uneven distribution hurts their longevity. The lack of easy access makes them hard to troubleshoot. And, although they're usually an economical solution, the scarcity of certain sands hike up the overall price.

The Ecoflo linear biofilter doesn't just solve these problems. It reinvents the category.

Wastewater flows through each chamber's integrated distribution channel. Treatment begins as effluent that is evenly distributed across the length of a coco filtration pad. An underlying layer of available sand completes the treatment before effluent returns to native soil. Access ports make it easy to sample the system's effluent quality and inspect its components throughout its life cycle.

The Rewatec dosing distribution box pairs seamlessly with the Ecoflo linear biofilter to ensure even distribution and to increase the system's lifespan.

The Ecoflo linear biofilter is eco-designed from beginning to end. Its integrated distribution channels reduce the amount of piping needed for the job. The coco filtration pads are compostable, renewable and 100% natural. All of the system's hard components are reusable, lightweight and made from one type of recycled plastic. The eco design is complemented by the Rewatec dosing distribution box, which uses no electromechanical parts and is also made from recycled plastic.

Coco's treatment quality pulls double duty here. The initial filtration it provides preserves the underlying sand layer, which never has to be changed. This also preserves the integrity of the native soil.

The Ecoflo linear biofilter's use of standard septic sand keeps the cost of



the project from skyrocketing, while the system itself is quick and easy to assemble.

"We went with the Ecoflo linear biofilter because it was only half the size of other systems, and we didn't need to import additional material. The system went together easily. We will use it more in the future versus other systems."

Larry Dedrick, Dedrick Bros. Excavating Ltd.

The Ecoflo linear biofilter is a reliable, versatile septic system that brings peace of mind to any project. It requires zero maintenance, and comes with the tools to help pros succeed. Installation and design guides are easy to find in Premier Tech's Pro Space. Its design tool converts flow rate to determine the number of runs, the sizing between them and the layout of the installation. The Ecoflo linear biofilter's components are also light and stackable, making them easy to ship and handle.

Want to know more? The Ecoflo linear biofilter is NSF approved, and Premier Tech is looking for local partners to sell and distribute it. Contact Premier Tech and become a partner today.

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ELEVATION PROBLEMS

Pumping Downhill

It's best to avoid it, but if a system must pump downhill, make sure to protect the pump from prematurely burning out. Columnist Todd Stair gives three options to solve this problem.

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Getting Up to Speed

Training new employees is such a critical element of the future success of your business, and if you aren't prepared, important items could get overlooked. This article outlines essential steps to remember while creating your own training program in order to give new employees the best possible start at your organization.

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Onsite Regulations and Environmental Sustainability Go Hand in Hand

You may think society is overregulated in general. But we need to maintain strong local health department oversight to replace an aging wastewater infrastructure.

From serving on my local city council and county board, I recall constituents and local residents attending meetings often railing over how many rules and regulations homeowners have to follow. Permits, variances and inspections gummed up the approval process for completing projects such as planting a tree in the parkway, installing a fence in the backyard or updating an electric service. They saw no good reason for pages and pages of compliance codes for seemingly simple home improvements.

After sitting in on years of public works committee meetings where we reviewed these rulebooks, maybe they had a good point in some cases. I can understand their frustration of seeking approvals for one thing or another and then having to pay a fee and face an inspection of the completed work. But I have also grown to understand how the rules in place make a lot of sense when you look at the big picture.

The need to control construction codes and ensure safety practices are followed is deeply ingrained in the civil servants I have worked with through the years. And I think it's generally a really good thing that someone is making sure high standards are followed. So it mystifies me when a governmental body strips away a layer of oversight, particularly in the area of wastewater treatment that I have followed closely for 20 years.

Such is the case currently in Indiana, where the state legislature has passed the House Enrolled Act 1402, which some observers have said transfers oversight of septic systems from local health departments to homeowners, the system users.

The use of septic systems as a percentage of overall wastewater treatment is growing and the onsite industry is continually improving their performance. **There is good reason to be bullish about the future of septic systems.**

THE GOOD AND THE QUESTIONABLE

It appears the new law makes some welcome changes — such as paving the way for easier statewide approval for use of new treatment technologies. It also seeks to speed up system design approval, requiring local health departments to issue residential onsite system permits no more than 30 days after receiving a completed application.

But it also prohibits local health department employees from “entering a property to inspect a residential onsite system” in several circumstances, such as if a private contractor hired by the homeowner says the system is functioning properly. And if a local health department determines an onsite system has failed, the law sets out a process where homeowners can seek a second opinion to withdraw the local health department order.

The new law interestingly also voids any local or county law that would be more stringent than onsite rules set forth by the Indiana Department of Health. Critics could argue this takes away local control of onsite regulations in the event that one region has a greater concern about polluted waterways or neighbor complaints about failing septic systems.

Environmental watchers say the changes are akin to turning inspection compliance over to the system owner, who would have a financial interest in reversing failure orders to avoid installing or repairing systems. And they argue this is not the time to relax onsite regulations.

TOO MANY FAILING SYSTEMS

A report in the *Lebanon Reporter* newspaper explains that of the approximate 800,000 onsite systems in Indiana, the state Department of Health estimates that up to 200,000 systems are failing or have failed. The report stated that Indiana has no statewide system for tracking the existence of septic systems and which ones need repair. Any system records are kept by local governments, and it was argued that the new laws put up roadblocks to local inspections and orders to repair or replace systems.

Dr. Indra Frank, the environmental health and water policy director for Hoosier Environmental Council pointed to a report that estimated more than 7,000 miles of streams are impaired with *E. coli* and failed systems are part of the problem.

“This bill ... has the potential to increase the number of failing septic systems in Indiana. Unfortunately, a failing septic system can mean

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untreated or inadequately treated sewage winding up loose or flowing into some of our streams and waterways,” Frank told the newspaper.

Tim Stottlemeyer, board president of national group Clean Choices Clean Water, told the *Lebanon Reporter* he thought the new law wouldn't help improve the onsite wastewater infrastructure. “We have a low water IQ as a society. ... Instead of tying the hands of health agencies, give them more resources to help them do their job better,” he said.

The new Indiana law appears to be a mixed bag. While it addresses inherent problems we see in the onsite industry — including the common permit approval delays and inconsistent approvals of new technologies — it also does appear to chip away at the ability of local regulators to cure problem systems.

A FAMILIAR PROBLEM

We have all met homeowners who will do just about anything to avoid repairing or replacing their aging septic systems. They are in the minority, I believe, as most people are concerned about polluted waterways or endangering a nearby drinking water supply. But the few may seek to exploit any easing of regulations so as not to deal with a treatment problem that is their responsibility.

We shouldn't let that happen.

Clean water is a basic need for all of us. Oversight of wastewater treatment is particularly important where private, decentralized systems are in place to handle the flow and make sure effluent is safely returned to the aquifer. The use of septic systems as a percentage of overall wastewater treatment is growing and the onsite industry is continually improving their performance. There is good reason to be bullish about the future of septic systems that were once looked at as only a bridge to the big pipe of municipal sewer service.

However, as an industry we must also recognize that expanded usage of private systems requires greater proof of performance to ensure a cleaner environment for generations to come. Professional, periodic inspections are a key to wider acceptance of onsite wastewater treatment as a permanent solution in many development situations.

Whether or not we perceive there is too much government regulation in our lives, installers must support greater scrutiny of private wastewater systems. □

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WHO'S GOING TO FILL THEIR SHOES?

California designer Ryan Fox is riding a wave of opportunity prompted by a shortage of onsite professionals; and the demand continues to grow

By David Steinkraus

Wastewater regulation is his family's trade, but Ryan Fox chose a different direction. He started his own onsite business in northern California, becoming a young man in a field that needs to attract young people.

In 2018, at age 27, he founded Fox Onsite Solutions. It's based in San Jose, California, on the edge of Silicon Valley, but in addition to Santa Clara County (which contains San Jose), he also covers neighboring Monterey and Santa Cruz counties on the Pacific Coast.

Fox Onsite Solutions does design, permitting and percolation and soil testing. There are a lot of great installers in the area, he says, so his business plan is to focus on what he can do well, refer installs to other contractors and hopefully receive referrals from them. In most of his territory, he says, more than half of the systems he designs use some kind of advanced treatment with pumps, panels and intricate wiring.

At the same time, Fox sometimes finds it difficult to find installers with the required skill level to install his systems. "You know the problem with great installers? They're busy," Fox says. Finding skilled people is, of course, a problem for the entire industry, but for younger people just entering the wastewater business, being one of a few people can be advantageous.

Although his present equipment is light and fits neatly in his 2018 Toyota 4Runner, Fox doesn't drive more than an hour from his base. He could, but he doesn't. "I have 15 requests for new work. That was from this week. I could take more, but I'm in a fortunate position that I do not have to," he says.

CAREER SEARCH

He grew up on a 100-acre vineyard in Fresno County. That's about 200 miles southeast of where he lives now, and Fresno County consistently



ranks among the top agricultural counties in the country. In 2021 the total value of the county's crops was \$8.08 billion.

"So I'm from a big farm background," Fox says. "My father was a regulator. He spent his whole career in environmental health, eventually becoming a director. My grandfather was a sanitarian before my father. My uncle was a dairy inspector."

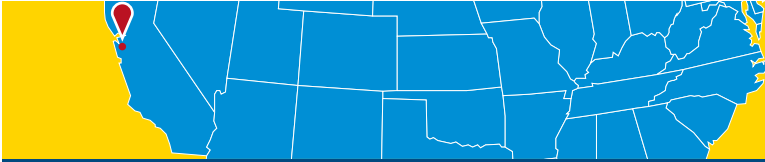
Fox originally thought of being a dentist, but along the way found something better. "And I found, since being a farmer, I really loved the soil, and the water, and I was drawn to that."

He went to the University of California, Davis, studied environmental health, and became an inspector. And he learned a lot, he says, because inspectors see everyone's work. "As a designer you're able to see only your work, or as an installer you're able to see only your installs," Fox says.

He also saw the people doing the work. "And I'm seeing an aging population of installers and designers," Fox says. "I am the youngest consultant in my area by, I would say, 20 years." He's 32 now.

◀ Ryan Fox uses a ZIPLEVEL PRO-2000 High Precision Altimeter to measure the slope of a hillside. (Photos by David Elkins)

▶ Fox measures groundwater levels at a site where a caretaker residence is to be built for a Santa Cruz County Land Trust nature center.



Fox Onsite Solutions

San Jose, California

Owner: Ryan Fox

Founded: 2018

Employees: 4

Service area: Santa Clara, Monterey, and Santa Cruz counties

Services: Onsite design and testing; system inspector in fire recovery

Associations: National Association of Wastewater Technicians, Colorado Professionals in Onsite Wastewater

Website: foxonsitesolutions.com

He saw people 65 and 70 years old doing physical fieldwork, but he also saw an opportunity to have his own business. He found a job with a four-day workweek, and that allowed him to start his business and spend one day a week doing consulting work outside of the county that employed him.

MAKING THE JUMP

At the beginning of 2022 his business had reached the six-figure annual revenue goal he'd set, he says, and he went full time. He would have left that job sooner except for the COVID-19 pandemic. "At that point I wasn't going to leave a steady, full-time job where I was getting paid very well."

When he did leave, his departure created another kind of job gap. Not only is it difficult to find technically skilled people to install systems, Fox says, but the same is true of inspectors. Those jobs also require specialized skills, he said, but they're a first job for many people just out of school, and it is common for people to leave for better-paying work after about a year.

That's not the end of the workforce shortages he sees. "In California we have required yearly maintenance of enhanced treatment systems. We have nobody who can do maintenance." People who own maintenance companies are losing workers, but this is a need that will only grow because regulations keep getting tighter, he adds.

He says he often receives questions from regulators about how they can also become consultants. Many regulators can't, Fox says. Some lack the physical strength to sink a hand auger 6 feet into the ground for a perc test. But what will blunt the hopes of most is the lack of a very specific skill: familiarity with AutoCAD software, a standard design tool for engineers, architects and others.



"You know the problem with great installers?
They're busy. ...
I have 15 requests for new work.
That was from this week."

Ryan Fox

» Ryan Fox checking a burned property in the Santa Cruz Mountains in preparation for a new septic system so the property owner can rebuild.



WILDFIRES AFFECT ONSITE SYSTEMS

The wildfires that blackened the West during the last few years consumed more than trees; onsite system components above ground — even some below — were damaged too.

Ryan Fox, owner of Fox Onsite Solutions, subcontracts with a private company as an inspector for the fire recovery area in Santa Cruz County. The wildfire there — properly called the CZU August Lightning Complex — was a collection of about two dozen wildfires that started in August 2020 in the coastal Santa Cruz Mountains and burned more than 86,500 acres. More than 22,000 people were evacuated, and the fire destroyed 911 homes before it was declared fully under control on Dec. 29, 2020.

Fox's job is to ensure the proper rebuilding of infrastructure for onsite systems and wells. He reviews plans, inspects onsite installations including the testing of advanced systems, everything that a county inspector would do. And he used to work as an inspector, so he knows the job.

"It's very highly specialized work to do this oversight. You need years and years of experience and embedded local knowledge," Fox says. "And you need the experience to oversee complex systems."

As properties are rebuilt, those old onsite systems have to be brought up to current code, Fox says. That requires a site be tested, and from that a designer determines what kind of system is needed. Technicians for testing are hard to find, he says, and often the replacement system must use advanced treatment to meet modern rules.

Old concrete tanks are usually undamaged, he says, and drainfields typically survive a wildfire. "Anything that was poly — it's done. If it was within a foot of the surface, and let's say 5 feet away from the house, those poly tanks are damaged." Even at 5 feet deep, the intense heat of a house fire can damage a poly tank, he says. And the poly tanks he's seen are older technology made of plastic not up to modern standards. The same goes for plastic risers and lids, he adds.

"I don't think anything with above-surface components can be fireproofed other than switching your fiberglass or poly lids to concrete lids," Fox says. The only addition he can think of is to set above-grade components as far away as possible from things that may catch fire, he says.

"Almost all of our panels, I would say nine of 10, are always set on independent posts near the pump location, and that in itself creates a protection mechanism," Fox says. Getting panels off structures also creates a more comfortable environment for customers because there is a vibration in the panels when pumps come on, he says.

"I would say my biggest learning curve, it's not the regulations, it's not the testing, but AutoCAD itself — creating a digital design that's legitimate, not like a drawing on a piece of paper." When he was planning his business, he says, he spent a couple of years taking night classes just to learn AutoCAD.

BIG-TICKET SYSTEMS

Given where Fox lives, he picks up quite a bit of work from tech industry millionaires. "San Jose is a city, but all the major million-dollar homes are not on sewer. There's a lot of septic in Silicon Valley," he says. "The one I'm working on now, he bought it for \$4.5 million as a fixer-upper, and we're about to add 2,000 square feet to it."

"I would say an average system is \$80,000," Fox adds.

Unbuilt parcels are few and far between, he says. "And the few raw parcels that are left are limited. They're cliff sides, very small lots or environmentally protected. And of course in California we probably have some of the strictest regulations due to our groundwater issues."

Most of the systems he designs use advanced treatment of some kind. And more than half of his 40 projects this year will involve second dwellings, he said. Building costs are so high that second dwellings provide more economical housing for relatives or are used as rentals. California wastewater rules encourage second dwellings with slightly lower design flow criteria, he says. For example, a four-bedroom house has a design flow of 450 gpd by itself and about 750 gpd with a second dwelling on the same lot.

"A lot of these systems are communal. If they're enhanced treatment, to keep the cost down we have to combine the systems," he says. Even a standard system may have a communal drainfield, but separate tanks, he adds.

California may not have the freezing temperatures of Colorado or the high water tables and clay soils of the Midwest, but its land presents other challenges, Fox says. "We have a lot of rivers. We have a lot of hills. We have a lot of slopes."

The onsite technology he uses is largely dictated by parts availability, he says. So he uses a lot of Orenco AdvanTex units because of good support service, because people know the equipment, and because parts are

continued »

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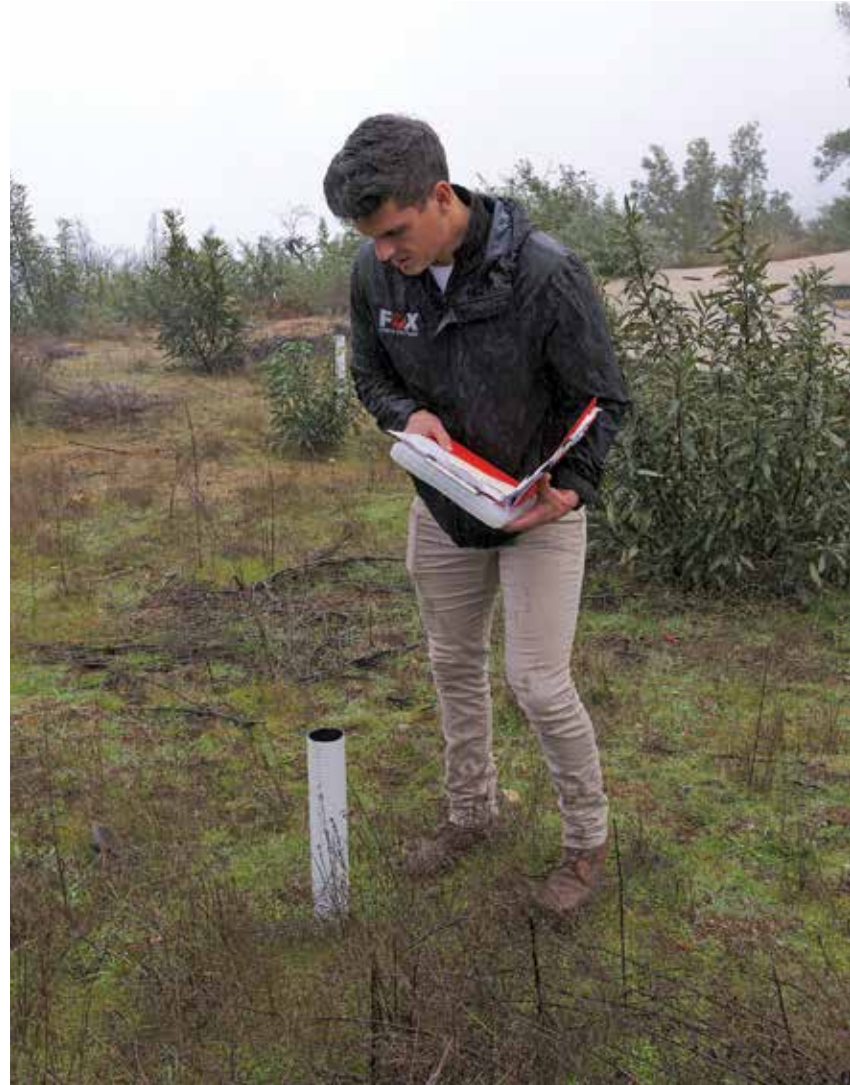


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◀ Ryan Fox inspects an abandoned septic tank that is slated for removal.

▼ Fox checks test holes at a burned property in the Santa Cruz Mountains in preparation for a new septic system so the property owner can rebuild.



readily available. Also, he adds, Orenco AX units eliminate the need for many adjustments; they're largely plug-and-play, which helps in an area with a shortage of technical people. Also common are products from AquaKlear and MicroSepTec.

LOOKING TO THE FUTURE

Because he doesn't do any installing, Fox doesn't have any machinery in his inventory. "I usually contract most of my earth work out," he says. It reduces his overhead, and it means he's not paying for expensive storage space in densely populated Silicon Valley. He has a lot of hand tools, specifically AMS equipment that he uses to bore his perc test holes.

He now has three employees: Cassandra Garza, who does part-time drafting; Sterling Scott, a full-time designer; and Alexis Barretta, his fiancé, who works part time in the office. A shortage of technical workers affected his search.

"We're getting to a point where you just don't need a guy who can run a tractor or a consultant who can dig a hole," he says. "You need somebody with both a physical and technical skillset with machinery, but then also a really high level of digital skills like baseline mapmaking, filling out complex permits, understanding online GIS. The time when you could just draw a square on a piece of paper is gone."

"You need somebody with both a physical and technical skillset with machinery, but then also a really high level of digital skills. ... The time when you could just draw a square on a piece of paper is gone."

Ryan Fox

"For me to get anybody good, I have to offer him six figures," he adds. One of his ideas to attract and retain technicians is for businesses to offer performance-based bonuses. In other words, he says, when a project is finished the employee receives a percentage of the fee. "We give them a

>> Fox Onsite Solutions, of San Jose, California, provides septic system design, permitting, and percolation and soil testing for a wide variety of projects. Owner Ryan Fox is shown out in the field.



“We need to expose people early to the industry. We need to get them known to the industry. We need to get them to know this is a high-wage-earning industry if you’re able to do it.”

Ryan Fox

light at the end of the tunnel. We just don’t run them into the ground with no gain.”

The talent pool he’s been looking at are people in college. “When I was in college, I was an environmental major. I would have loved to work a part-time job with high wages,” he says.

This year he plans to establish a physical office with an administrative assistant, a full-time associate, and hopefully a group of two to three part-time college-level workers. They could do some of the lower-skill work such as filling out permits, some testing and some CAD tasks. Think of it as a minor-league team that can feed good players into full-time slots with the company — or another company.

“We need to expose people early to the industry,” Fox says. “We need to get them known to the industry. We need to get them to know this is a high-wage-earning industry if you’re able to do it.”

While he mostly looks ahead, he values the accumulated experience of the older installers in his area. In particular, he says, there is Chris Rummel, of Rummel Design Criteria, a former regulator himself who went out of his way to help Fox get started.

“In my area, I’m so blessed to have so many great, experienced local guys who have given back so much,” Fox says. As young as he is, Fox intends to do the same — starting now. ❑

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Follow These Keys to Reliable Pump Installation

For trouble-free service, ensure secure connections and watertightness from the electrical source to the pump components

By Sara Heger

A complete pumping system includes a pump tank, pump and controls. The first issue is that the tank must be watertight and constructed of materials that will not corrode or decay. The access for the pump and other components should come to the finished grade. In addition, the access should be far enough above the finished grade to prevent water intrusion from rain events.

The pump, piping and floats should be located directly under the lid, as easy access to these components for management is necessary. The cover of the pumping tank, the septic tank, and all cleaning access extensions must be watertight to prevent groundwater from infiltrating the system. Pipe connections to the tanks also must be sealed to be watertight. The cleaning access must be securely fastened or locked so unauthorized persons cannot enter the tank.

Be extremely careful to ensure the pump tank supply line does not settle. Additional support may be necessary to ensure the system will operate without sagging, which can lead to clogs or freezing in cold climates. Placing the supply line in conduit or a stronger pipe throughout the excavation area is a recommended practice along with proper pipe bedding.

As discussed in previous articles, pumps are sized according to the specifications of each system, and a specific model should be indicated in the design. A “similar” pump should not be used unless confirmed in writing by the designer.

ONGOING ACCESS

Proper pump installation is critical to ensure the pump will perform as designed. No electromechanical devices or connections should be in the pump tank or cleaning access/riser. The electrical plug-ins should be in a weatherproof enclosure near the pumping tank or building. It is a great idea and sometimes required to attach the control wires to a separate

If the wire is directly buried, you must excavate and/or bury new wire.

If in conduit, you pull the wire from one end and feed the replacement wire in the existing conduit.



⚠️ This is an example of an inadequate installation of pump controls. (Sara Heger photo)

⚠️ Improper electrical connections inside a pump tank. (Nicholas Dykes photo)



pipe (float tree) and the pump to a plastic rope or chain with an anchor to remove the control wires without removing the pump. Also, if the pump has malfunctioned, it can be removed without disturbing the control wires.

The other issue this helps with is when floats are the problem, they can be removed and adjusted for replacement without removing the pump. Although ropes are commonly attached to the pump, these can be problematic if they become detached at the riser as they fall into the tank and get sucked into the impeller of the pump and cause pump failure. Chains are an alternative but expensive. Tom Fritts, of Residential Sewage Treatment based near Kansas City, Missouri, uses a piece of 12/2 UF wire often needed for electrical repairs. If the wire detaches at the riser, it is rigid enough to stand up in the riser.

Pump systems should include a control panel. The control panel can be simple or more complex based on the functions it must perform. Electrical components in the panel respond to water level sensors or floats in the tank. The components then perform a variety of essential functions:

- Automatically turning the pump on and off with a manual override
- Turning the pump on and off
- Preventing the pump from running in a time dose system if the water level is too low
- Sounding an alarm to indicate problems
- Providing a means of monitoring the system (meters/counters)
- Initiating a telemetry device for system alerts
- Activating of equipment for remote system operation

Several types of devices may achieve these functions. In all cases, electrical components and connections must be adequately protected from the elements and the corrosive environment of the pump tank. Ideally, this is achieved through use of a National Electrical Manufacturers Association 4X enclosure (4X refers to watertight and corrosion protection enclosure) with properly sealed connections.

Two methods, or a combination of the two, are common in outdoor wiring. One method is to place electrical wires inside a conduit. The other is to use cable. In either case, protection from physical damage, water, and corrosion must be provided. Running wires through sealed conduit provides physical, water and corrosion protection.

THE RIGHT SHIELD

Several kinds of conduit are acceptable for outdoor use. Rigid metal conduit made from aluminum or steel provides equivalent wire protection. However, aluminum conduit is not recommended for installation where it is directly in contact with soil. Rigid PVC conduit can be used above ground. High-density polyethylene conduit is suitable for underground installation.

Do not use thin wall conduit for underground or outdoor installations. An underground feeder cable can be buried without conduit protection. Still, physical protection for underground cables is highly recommended to reduce the risk of spading through the cable later. This is particularly true around the septic tank.

Another advantage of running the wire in conduit is wire replacement

in the future. If the wire is directly buried, you must excavate and/or bury new wire. If in conduit, you pull the wire from one end and feed the replacement wire in the existing conduit.

Combining the conduit and cable wiring methods is also an option. Conduit can be used around cable for physical protection. Conduit is particularly useful to protect cables entering and exiting the soil. If conduit and cable are combined, appropriate connectors and bushings are needed to transition from one system to another. Minimum burial requirements apply to wire in conduit and cables.

The area around the conduit entering the tank should be sealed to prevent surface water from entering the tank through the conduit. If the conduit provides a continuous connection between the control center box and the tank, the conduit entrance to the box should be plugged with electrical putty to prevent the movement of moisture and corrosive gases into the control box. Provide an outlet for the wires through the side of the cleaning access.

WIRING SPECS

Do not use nonmetallic cables for underground installations. While it is an excellent material for interior wiring, it will not withstand moisture conditions in the soil. Consult with an electrician. Ensure the wire has the proper capacity for the electrical demands of the pump. This is done by comparing the length of wire necessary from the pump to the power box and the horsepower required for the pump. Having these two values allows for the proper selection of the wire sizes (see table).

The table shows wire specifications for various lengths and motor ratings. Most charts use amp draw instead of horsepower. Pump motors will have the amp draw stamped on the nameplate, and you can use that for wire sizing. These wire sizing charts are available online, making this an easy process. A second wire should be run for the alarm and on a second circuit.

Wire Length for Pump Rating Motor Ratings

Motor Rating		AWG Copper Wire Size					
volts	hp	14	12	10	8	6	4
115	1/2	130	210	340	540	840	1300
115	3/2	190	300	490	750	1100	1700
230	1/2	250	400	630	950	1400	2100
230	3/2	350	550	870	1300	1900	2800
230	5	500	750	1150	1700	2500	3700
230	7 1/2	600	900	1350	2000	2900	4300
230	10	700	1050	1550	2250	3300	4900
230	15	900	1350	2000	2900	4300	6300
230	20	1100	1650	2400	3500	5100	7400
230	25	1300	1950	2850	4200	6000	8700
230	35	1700	2550	3850	5600	8000	11700

2- or 3-wire cable, minimum length in feet, service entrance to motor.
 * Lengths meet U.S. National Electric Code (NEC) ampacity only for individual conductors 60C cable in free air or water, not in conduit. If cable rated other than 60C is used, lengths remain unchanged, but minimum size acceptable for each rating must be based on the NEC table values for that temperature cable.
 Lengths without asterisks meet NEC ampacity for individual conductors and jacketed 60C cable.
 For jacketed cable is considered jacketed cable.
 Maximum lengths shown maintain motor voltage at 95% service entrance voltage, running at maximum nameplate ampere.
 If service entrance voltage will be at least motor nameplate voltage under normal load conditions, 5% additional length is permissible for all sizes.
 Cable based on copper wire. If aluminum wire is used, it must be two sizes larger. If table calls for #12 copper, for example, #10 aluminum would be required.

SYSTEM PROFILE

▼ David Hartsell Jr. monitors the setting of the Norweco Singulair Green beside the Hydro-Kinetic Bio-Film Reactor. The system treated wastewater from a home built for a raffle to benefit St. Jude Children's Research Hospital. (Photos courtesy Chris Stevens/ Stevens Septic Service Inc.)



North Carolina Volunteer Installers Help With St. Jude's Fundraiser

Norweco Singulair with UV treatment and drip dispersal is the onsite answer for a charity raffle home build

By David Steinkraus

When the opportunity came to volunteer his help to help sick children, Chris Stevens took it.

Stevens owns Stevens Septic Service Inc., of Monroe, North Carolina. Newton Custom Homes invited Stevens to join in its annual charity project to build a house. The homes are raffled off with \$100 tickets, and proceeds benefit St. Jude Children's Research Hospital in Memphis, Tennessee.

"He asked me if I'd like to be a part of it, and I told him, 'Sure, I'd love to,'" Stevens says. He does work for the builder, he adds.

The house is 2,800 square feet and is located in Monroe, part of the metropolitan area around Charlotte. It has four bedrooms, two and a half bathrooms. Local television station WBTV-3 provided coverage of the process.

The house required a new septic system, and the property wasn't septic-friendly.

Advanced treatment

Wastewater leaves the house in a 4-inch Schedule 40 PVC pipe that runs 10 feet to the first tank. It's a

continued >>



▲ The dripfield in Monroe, North Carolina, contains 2,400 linear feet of Geoflow tubing split into two zones. An indexing valve, the black cylinder in foreground, splits the flow between the two zones.

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Shades of Sherwood Campground in Zumbota, MN

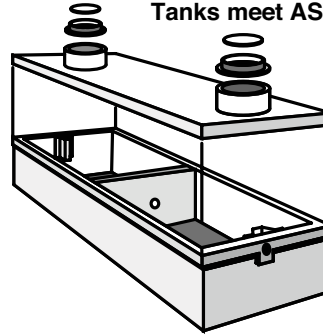
2- 38,000 gallon septic tanks, 20,000 gallon pump tank,
 5 each 20,000 gallon recirculation tanks
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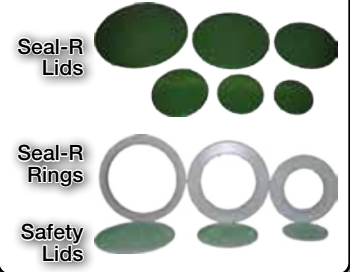
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SYSTEM PROFILE

» The house in Monroe, North Carolina, was built for a raffle that benefitted St. Jude Children's Research Hospital in Memphis, Tennessee. It is 2,800 square feet and has four bedrooms.

» With backfill in place, the system for the St. Jude dream house in North Carolina shows only a few lids. In the foreground is access to the pump tank along with the control panel.



1,000-gallon two-chamber concrete model from Shoaf Precast Inc. of Lexington, North Carolina. This tank settles solids and provides initial treatment.

Wastewater next flows about 4 feet into a Norweco Singularir with one of its Hydro-Kinetic Bio-Film Reactors. This is a 800-gallon Bio-Film Reactor using attached-growth media.

Another 4-foot run of pipe takes water through an AT1500 UV treatment system, also from Norweco. Four feet more takes effluent into the pump tank, another 1,000-gallon concrete model from Shoaf. This contains a Norweco-supplied high-head turbine pump.

Water is pushed about 30 feet through 1 1/2-inch pipe to the dripfield. It contains 2,400 linear feet of Geoflow tubing buried 6 inches deep over an area of about 50 by 100 feet. An indexing valve splits the flow between the two zones of the dripfield.

A 1-inch return line picks up any effluent not pushed into the drip tubing and drops it into the pretreatment stage.

To do this job, Stevens used a Kubota KX40 compact excavator with a hammer, a John Deere 85G mini-excavator and a John Deere 325 tracked skid-steer.

System Profile

Location:	Monroe, North Carolina
Facility served:	Single-family home
Designer:	Larry Thompson, Thompson Environmental Consulting, Midland, North Carolina
Installer:	Stevens Septic Service Inc., Monroe, North Carolina
Type of system:	Norweco Singularir with dripline dispersal
Site conditions:	Shallow rock
Hydraulic capacity:	480 gpd

"The soils were shallow to rock. We spent a week digging the tank holes because it was so rocky."

Chris Stevens

Brown rock

"The soils were shallow to rock," Stevens says. That was the reason for the system that was eventually chosen. "We spent a week digging the tank holes because it was so rocky."

Soils in his area are more than just clay. "Once you get down to a point, the clay turns into a brown rock," Stevens says. It's not exactly rock, he explains, but it's harder than lumps of clay in a garden that you can crumble with your hands.

All the digging required trucks, Stevens says. Norwood Trucking & Grading of Waxhaw, North Carolina, hauled away about 16 loads of rock dirt that came out of the holes, then brought in about six loads of fill. "They didn't charge a dime," he adds.

In addition to Larry Thompson, professional engineer Larry Groves was also involved to supply an engineered-option permit. The EOP is a process created in 2016 to speed up approvals of onsite systems.

“He asked me if I’d like to be a part of it, and I told him, ‘Sure, I’d love to,’ I know St. Jude, and I know what they do for kids and families, and it was worth every penny.”

Chris Stevens

A licensed soil scientist and a professional engineer can design a system and submit the plan to local health officials. Those local officials have 15 days to review the permit application, and if they agree it is complete, they issue a permit. “Some counties are eight to 12 weeks out on issuing a permit. If you go engineered option, you might get it quicker than that,” Stevens says.

With an EOP, the liability for the system falls back on the soil scientist and engineer who designed it, he adds.

It wasn’t only Newton Custom Homes that donated to the project. Local news station WBTV-3 reported that more than 75 volunteers showed up in February 2023 to start building the home.

“I know St. Jude, and I know what they do for kids and families, and it was worth every penny,” Stevens says. □

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» Justin McDaniel, of Stevens Septic Service, inspects the installation of the second concrete tank in the treatment train in Monroe, North Carolina.



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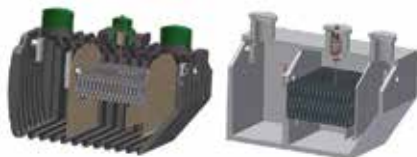
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Once connected, the user navigates to a website that provides all control settings for the panel, including a history of system function critical to troubleshooting and maintaining a pump-driven system. With the **Tapper**, the user can program and manage multiple panels and capture and download system events and settings onto a removable USB memory device. **800-221-4436; www.infiltratorwater.com**

Orenco Systems 4-in-1 Controller

The **4-in-1 Controller** from **Orenco Systems** supports numerous electrical configurations and dosing schedules in a single panel. Both simplex and duplex models are available and can be configured in the field for timed or demand dosing. While the control circuit operates on 120-volt power, the pump circuit is dual-rated for 120- or 240-volt power. It includes a programmable logic unit with multiple timing intervals for changing flow conditions and an elapsed-time meter and counter. It also displays float position and has a float error indicator. Each panel includes a reference chart to assist with troubleshooting during installation and testing as well as wiring diagrams. It is touch-safe. **877-257-8712; www.orenco.com**



SJE Rhombus' Installer Friendly Series Drip

SJE Rhombus' Installer Friendly Series Drip control panel is designed to control one 120- or 230-volt single-phase pump for subsurface irrigation systems. It features a simple touch pad on the inner door for programming and monitoring system operation. Programmable options include rest for standard time, rest for peak enable time, spin filter flush time, dose time, field flush time, field drain time and low alarm activation. The touch pad features indicator lights to monitor the panel at a glance, including alarm and control power, hand/off/auto, float status, cycle status and rest time. The LED display offers more detailed information, including high water alarm count, float status sequence error count, low level cutout float open low alarm count, and standard dose count. The enclosure is rated NEMA 4X for indoor/outdoor use. This panel is also UL/cUL Listed. **888-342-5753; www.sjrhombus.com**



SPI 50B019-120-240 DD

The **50B019-120-240 DD** control panel from **SPI** is a duplex timed-dosing panel for residential or commercial applications. It can be used with 120- or 240-volt power, and accommodates two dosing pumps controlled by a repeat-cycle timer. It has a durable, weather-resistant, NEMA 4X polycarbonate enclosure with SST latches; large, easy-to-access terminal block; circuit breakers for the



PRODUCT FOCUS

pumps and control circuits; a rugged externally mounted, UV-resistant alarm light; audible alarm and run-mute-test switch with UV-resistant sealing boot; definite purpose motor contactors; alternating relay; and pump hand-off-auto switches. Compressor hookups are available. Wiring schematic and detailed connection diagrams are provided, as well as mounting feet for the enclosure. It is UL-listed. **419-282-5933; www.septicproducts.com**

SPRAY IRRIGATION EQUIPMENT

Norweco All-Season

Norweco's All-Season spray irrigation system was developed to provide homeowners with a safe and convenient method of effluent disposal. Designed to maximize water reuse, spray irrigation is a simple and low-cost method of effluent disposal for properties with marginal soils and challenging topography. The system was engineered to operate in the harshest weather conditions, distributing disinfected effluent directly onto the homeowner's lot, according to the maker. The effluent is sprayed in a discreet location, where it is safely returned to the environment through gradual soil absorption and moisture uptake by grass, trees and other vegetation. Units comes with an adjustable spray head, vacuum relief valve, pressure gauge, Schrader valve, electrical enclosure, zone shutoff valve, heat tape with factory preset thermostat and anti-freeze drain valve. **800-667-9326; www.norweco.com**



SUBMERSIBLE PUMPS



Crane Pumps & Systems envie3

The envie3 air-filled motor series dry pit submersible pump from Crane Pumps & Systems can run in wet applications and in dry pits. These pumps took Barnes' and Deming's

proven nonclog and chopper wet ends and outfitted it with a premium efficient/IE3 motor that can run in both vertical and horizontal configurations. The closed-loop glycol cooling system allows for easy maintenance and installation in demanding applications. For easy serviceability, the horizontal installation options include a cart system, which creates a back pullout option as well as a fixed bracket configuration. Install horizontally for a smaller footprint. Vertical installation configurations include a metal and concrete stand that allow for 360-degree rotation for conveniently adapting to existing piping, including tangential discharge pumps. **937-214-9008; www.cranepumps.com**

Franklin Electric Little Giant WE Series

The Little Giant WE Series is built with a Franklin Electric submersible motor, designed to provide maximum durability and years of reliable service. It consists of a high-head filtered effluent pump powered by a 1/2 hp submersible motor and includes a removable built-in check valve. The quality top bearing and stainless steel upthrust washer add resilience and reliability, according to the maker. **800-437-6897; www.littlegiant.com**



Gorman-Rupp SFSC Pump

The SFSC Pump from Gorman-Rupp is an SF Series product equipped with Eradicator Plus solids reduction technology. These are the most aggressive in the SF Series product lineup and are designed for applications where nonwoven flushable wipes, trash bags, hair, industrial byproducts and agricultural wastes are present. All pumps are equipped with a heavy-duty continuous vane impeller. The pumpout vanes incorporated into the thick back shroud are designed to help prevent buildup of debris behind the impeller. The wear plate utilizes notches and grooves with an oversized lacerating tooth designed to cut and shred organic solids before they enter the pump. Pumps are available in 3-, 4- and 6-inch discharge sizes. **419-755-1011; www.grpumps.com**

Polylok PL-CPE4A

The Polylok PL-CPE4A is a submersible, 4/10 hp, 115-volt, single-phase effluent pump with a 2-inch NPT vertical discharge. It has a maximum head of 38 feet and a maximum flow of 56 gpm. The pump is designed with a 3,450 rpm oil-filled permanent split-capacitor motor and has an amp rating of 6.6 for 115 volts, a rugged cast iron housing and volute equipped with a cast iron vortex impeller capable of passing 3/4-inch-diameter solids. The stainless steel shaft is supported by two single-row, oil-lubricated ball bearings. The shaft seal is an inboard design with a secondary Exclusion V seal. It has a 20-foot UL/CSA-listed power cable suitable for submersible service and fitted with a three-prong plug. The unit is supplied with an integrated clip for the included piggyback mechanical float switch and used for automatic operation. **888-765-9565; www.polylok.com** □



CASE STUDY

Distribution Equipment and Systems

By Craig Mandli

Water pump system designed to meet future expansion needs



Problem: A developer with a 250-unit apartment complex in northeastern Washington required a wastewater pump station to address present needs, while providing expansion possibilities for future flows. The wastewater lift station had to be designed for integration into a shared force main with another lift station and several grinder systems. The design had to consider the existing wastewater infrastructure, while anticipating future pressures, ultimate flows and additional development. Developing a now-and-then pump system on these project-specific guidelines required accurate data and engineering to produce the best possible outcome.

Solution: Romtec Utilities coordinated with the developer and consulting engineer to design and configure the wastewater pump station. A pressure data logger was installed at the force main's connection point to get accurate readings for the current high and low pressures that the lift station was pumping. The existing system was evaluated, and the data was gathered and used to develop a triplex system design and pump sizing.

Result: To satisfy the end owner and reduce developer costs, components and interim pumps were supplied for the initial phase, while also ensuring that the wastewater lift station is scalable for continuing development. 541-496-3541; www.romtecutilities.com

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Cape Cod Health Board Refuses to Drop Nitrogen Rules

By David Steinkraus

A Realtors association asked health authorities in Tisbury, Massachusetts, to reconsider new nitrogen-reducing onsite regulations. The health board refused.

Last fall, the Tisbury Board of Health, located on the island of Martha's Vineyard, expanded requirements for installing nitrogen-removing technology. These new rules require advanced treatment when an existing septic system is upgraded, repaired or replaced. The new rules apply only to properties in the watersheds of Lagoon Pond and Lake Tashmoo.

In a letter to the health board, the Cape Cod & Islands Association of Realtors said the new rules will target one of the few areas of affordable housing on the island.

"We are writing to ask you to reconsider a portion of your new regulation as your reconsideration will help with year-round home affordability and also maintain our common goals for clean water," said the association's letter, according to the *Martha's Vineyard Times*.

"The average-priced home that sold in these areas over the last year was \$1.5 million — well below the island's average of \$2.2 million," the letter said. "This action quite simply makes the more attainable properties in Tisbury more unaffordable." The association asked the board to require a technology upgrade when a property is transferred.

Jeff Pratt, a member of the health board, said the town's regulations are no more strict than changes considered by the state Department of Environmental Protection. The state recently implemented new rules establishing nitrogen-sensitive areas and requiring advanced treatment.

The health board voted unanimously to decline the association's request.

In other Massachusetts news:

The Mashpee Board of Health is considering a fine for people who install onsite systems without a permit.

Zackary J. Seabury, the town's health agent, proposed the idea at the board's November meeting, reported *The Enterprise*, of Falmouth. He said his department has received calls during the past year asking for final inspections of systems he had never approved. A call just before the meeting involved a company not licensed to install systems in the town.

Seabury suggested a \$150 fine for installing without a permit. A second offense would be penalized with a \$300 fine, and people installing without a license could be fined \$200. Subsequent violations during the same calendar year could result in the revocation or suspension of an installer's license. The license could be reinstated in the following calendar year.

The Falmouth Board of Health adopted a new set of onsite regulations that allow little room for cesspools.

Under the regulations, any cesspool discovered during a Title 5 inspection will be considered to have failed, and it will have to be replaced with a system compliant with the state's Title 5 rules.

Not all homes with cesspools will fall under the new rules, reported *The Enterprise*. Although any home being sold must pass a Title 5 inspection, homes with cesspools that passed inspection before Feb. 1 will not need immediate upgrades. Instead, the inspection will remain valid for two years for homeowners who wish to sell.

Adding bedrooms to a home will trigger a Title 5 inspection, and condominiums with five or more units must undergo inspections every three years. Homeowners not selling their homes or adding bedrooms may keep cesspool systems as long as they are functional.

Puerto Rico

Puerto Rico will receive more than \$52 million from the federal government for a variety of water projects across the island. About \$30 million of the total comes from the Bipartisan Infrastructure Law passed last year, said a press release from the U.S. Environmental Protection Agency. The island's Clean Water State Revolving Fund provides interest-free or low-interest money for wastewater infrastructure projects including decentralized wastewater systems, nonpoint source pollution control, stormwater runoff mitigation, green infrastructure and water reuse.

Michigan

The new Democratic majority in the state Legislature has promised to pursue a statewide onsite code. The onsite code was one of several environmental bills pushed into the 2024 session, reported the news website *MLive*.

Legislators had introduced bills last spring to create a statewide code. (Michigan is the only state without statewide rules for onsite systems.) Among other things, the bills: defined onsite systems; specified the duties of local health departments; required system inspections at least every five years; and created a technical advisory committee at the state Department of Environment, Great Lakes and Energy to make recommendations about the standards, technologies and qualifications of service providers who would inspect and manage onsite systems.

The bills also would create an onsite fund for administrative costs, for grants to local health departments to carry out their duties, and for grants to lower-income people who need to upgrade their onsite systems.

In 2022, legislators introduced a bill to require onsite system inspections at the time of a property sale, but that bill failed. It was opposed by the Michigan Realtors association.

Louisiana

St. Tammany Parish is considering a new rule to require onsite system inspections every three years.

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The unincorporated area is north of New Orleans on the other side of Lake Pontchartrain, and officials there estimate it may hold 36,000 onsite systems, according to the news site nola.com.

If the ordinance passes, Tim Brown, director of the parish's Department of Environmental Services, said his four-person inspection staff will start with a test run of 400 inspections. Each homeowner will be charged \$100 for the service.

Most homes use aerobic systems because of poor percolation in the dense red-clay soil. Troy Cooper, owner of Cooper Septic Services, told the news site that some property owners opt to not fix problems and continue with failing systems.

Oregon

Property owners in Tillamook, Clatsop and Columbia counties are eligible for money to repair or replace failing onsite systems.

Backing the awards is a \$1.5-million grant received by the nonprofit Community Action Team from state coronavirus recovery funds. Loans offered through the onsite repair program are interest-free and payment-free and available to people making 120% of the area's median income. That's about \$60,000 for a single person and \$75,000 for a family of three in Tillamook County. Loans are repaid when a property sells.

New York

Last fall, the 100th nitrogen-reducing onsite system was installed in Nassau County. From its start in 2021 to the beginning of November, the county program to upgrade onsite systems has disbursed \$4.2 million in grant funding. Homeowners are eligible for up to \$20,000 to offset upgrade costs.

Neighboring Suffolk County started a similar program in 2017. Both counties are on Long Island where nitrogen pollution from onsite systems, many of them cesspools, has fouled nearshore waters.

Obstacles still exist to the broader adoption of nitrogen-reducing technology, reported the Long Island newspaper *Newsday*. The paper quoted Salvatore Motta, who co-owns Discount Cesspool & Drain, Inc., who said complex permitting requirements are an impediment. "The process is so long and tedious that some homeowners don't feel like doing it." □

"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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Manitoba Needs to Update Onsite Regulations – Then Enforce Them

Relative industry newcomer Brett Gaudry wants to bring septic system rules from other Canadian provinces to raise the standards of wastewater treatment

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 Manitoba Onsite Wastewater Management Association.



Brett Gaudry

owner

Business: BNS Excavating, Teulon, Manitoba

Age: 29

Services we offer: Septic installations and repairs

Years in the industry: Two. I worked on the railroad for 10 years as a bridges and structures supervisor. But during COVID I decided to try something else. I always wanted to start my own business and this was the closest thing available because I knew a guy who owned a company that did this. I worked with him for a few months and took the courses.

Association involvement:

I've been in the Manitoba Onsite Wastewater Management Association for two years and I'm currently a director.

Benefits of belonging to the association:

Having connections with other like-minded people in the industry, staying up to date with regulations, and having access to the information needed for a young and growing company.

Biggest issue facing your association right now:

The other provinces have updated their regulations according to the newest engineering standards, but Manitoba's regulations are way out of date. We have been grinding along on the process but there's no expected completion date. I believe the regulators have finished writing the changes but now it's going through the editorial process. So our training is shut down. And this makes it extremely difficult for new companies to be competitive. I trained in a different province with more restrictive regulations, which I'm trying to bring into the industry here where customers are used to really relaxed regulations. It's hard to get the message across.

Our crew includes:

My wife Samantha does a lot of the computer and book work as well as marketing and picking up parts. And I hire a friend, Brent Eicle, when I need help with installations.

Typical day on the job:

I'm either driving around looking at future jobs to quote, quoting in the office, picking up parts, scheduling jobs or working in the field. We're mostly replacing tanks and hooking customers up to low-pressure sewer systems near Winnipeg. Some people are being forced to go on low-pressure sewer systems, but they're also required to keep their tank and pump, to pump into the sewer system. Not too many people are happy about it because they still have to pay for the tank and maintenance on top of a sewer bill.

The job I'll never forget:

Our first tank install was a 4,500-gallon commercial holding tank. I was using an old backhoe so it was quite difficult to move all the soil when you can't swing all the way around. Not only that, but the ground was in an industrial park that was built up from a low-lying area, so water was pouring into the hole constantly from the high water table. By the end of it, the hole was so massive and so sloped out that we could barely reach to drop the tank in.

My favorite piece of equipment:

My 2012 Ram 3500. Without it, I would not have been able to start this company. It's been reliable for the past 11 years with no issues and pulls all our equipment with no problems. I'm hoping to retire it from the company in the near future, as soon as we get a truck and trailer that can pull larger pieces of equipment, like full-sized excavators.



◀◀ A 2012 Ram 3500 is pulling a Caterpillar 279 skid-steer and Caterpillar 303.5 excavator heading out to an installation. (Photos courtesy of BNS Excavating)

▼ Brett and Samantha Gaudry with their son Leo.

Most challenging site I've worked on:

What I find the most challenging is when we need to make a long trench and the customer doesn't want to directional drill. It always turns out to have the worst soil conditions so the trench is constantly caving in before you get the pipe in, and you're going back and forth, redigging what you already dug and watching it cave in as you dig it. We have basically three soil types here. The heavy clay is great, it doesn't cave in and holds up nicely. The gravelly glacial till is more sandy so it's not too bad. But the silty clay just crumbles away, you can't pack it or form it.

Oops, I wish I could take this one back:

In our first year, we were hired by a contractor to dig a foundation, after which we were going to install a septic system. But after finishing the foundation, the contractor disappeared and we and the engineer were never paid. The whole project got shut down.

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

"Why do you need a permit and a soil test? Just give me a tank and a field." This is why I think we need more education and awareness of our industry. I beat the drum all the time trying to explain everything. But sometimes people go and find a company that's fine with skirting regulations.

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

I'd like to see more in-depth soil testing.

Best piece of small business advice I've heard:

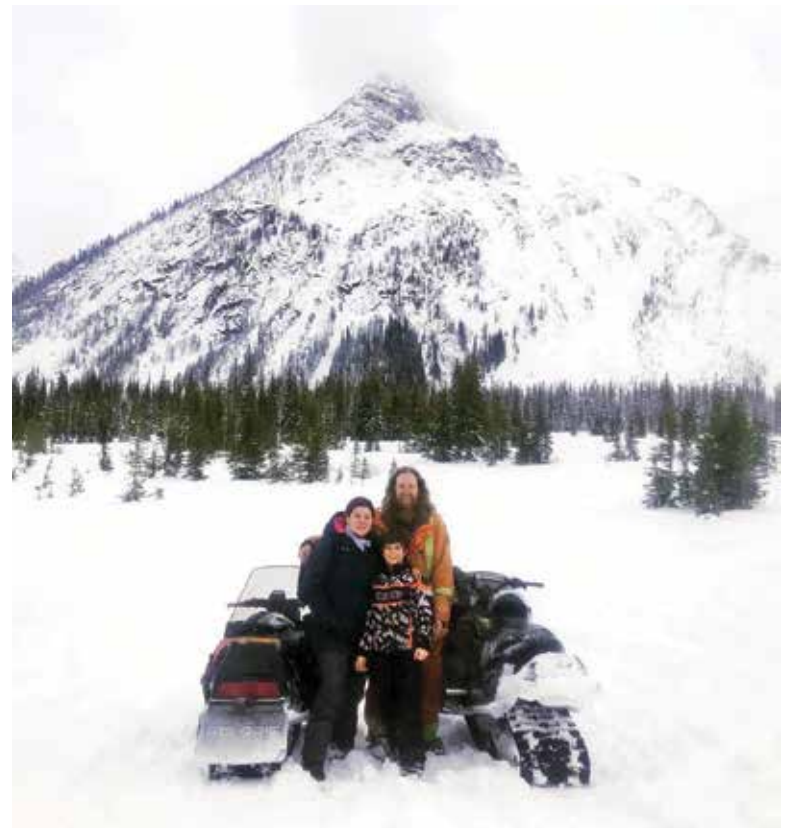
Imagine your business as a fire. Do you want to build a big hot fire that burns out quickly like gas, or a fire that may take a while to get going but will last a long time by building it slowly and properly like a campfire? I don't recall who gave me this advice but it has definitely been helpful to me to stay stable as a business.

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

I'd probably still be working for the railroad. Other than that, anything that requires machine operating.

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

I'd like to see Manitoba follow the other western provinces with more education, more onsite wastewater systems rather than sewer systems, and maybe turning this industry into an actual trade which would make it more credible and there would be more public awareness. □



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

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

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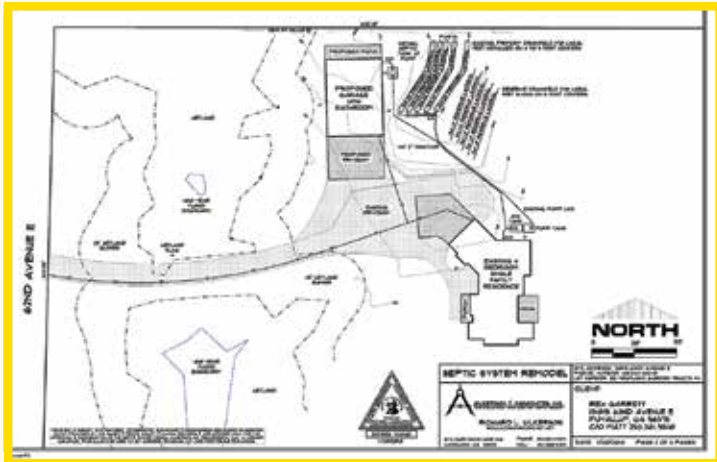
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PRODUCT NEWS

PRODUCT SPOTLIGHT

Software helps installers tackle system design

By Tim Dobbins



Traverse PC connected with the septic design industry around 2008 when system designers were required to submit a site plan for project approval. They saw the opportunity to help bridge the gap between septic designers and the need to deliver professional drawings.

“Traverse PC was designed to fast track the data to drafting processes for land surveyors,” says John Balcom, owner of Traverse PC. “In the past, installers needed to learn basic surveying methods like angles and distances to locate site features. Today, the Global Navigation Satellite System has removed that hurdle.”

TPC is designed so installers with a basic understanding of point positions can operate any of their GNSS receivers. Once learned, Traverse PC is a turnkey software solution to locating features, developing and submitting a site plan, and locating and staking out design elements. When purchased, the software download is emailed to the installer.

The software can be used to define areas with GPS, bearing and distance, and total station. It can create buffers and setbacks, automatically dimension and label boundaries and comes with hundreds of line types symbols, fonts and hatch patterns. Completed drawings can be exported as PDF, PNG, CAD, GIS or physically printed.

The company understands that not everyone can fire up the software and automatically know how to use it. “We don’t shy away from the fact that our program has a learning curve and may take a few days to master,” Balcom says. “With the aid of our Learning Center, TPC software can be mastered in a weekend.”

“We have worked hard to provide practical guidance including video instructions, demos, and a detail-oriented online user’s manual. Once installers get the gist of the program, their workflow times will be shorter and their deliverables will be happily received.”

According to Balcom, Traverse PC has recently teamed up with Emlid to offer a small line of GPS/GNSS receivers. TPC’s GNSS bundles utilize Android or iOS devices for field work, works with points on top of a street or terrain map and integrates office and fieldwork via the cloud. **800-460-3002; www.traverse-pc.com** □

SFA Saniflo Sanipit 24GR retrofit pump kit

The Sanipit 24GR offers an easy, mess-free and reliable replacement solution for faulty sewage pumps and components from major manufacturers in North America, according to maker SFA Saniflo. The retrofit pump kit offers a 1 hp grinder motor and air pressure mechanism that fits most 24-inch basins. With the ability to retrofit into 24-inch basins from Liberty Pumps, Zoeller and Myers, the pump kit is compatible with existing pump systems. The current basin stays in place while the Sanipit 24GRs retrofit cover adapts to it. The Sanipit 24GR creates a dry cavity within the pit. SFA Saniflo’s design keeps the components and the motor separate for a hassle-free and mess-free experience for plumbing installers and service technicians. **800-571-8191; www.saniflo.com** □



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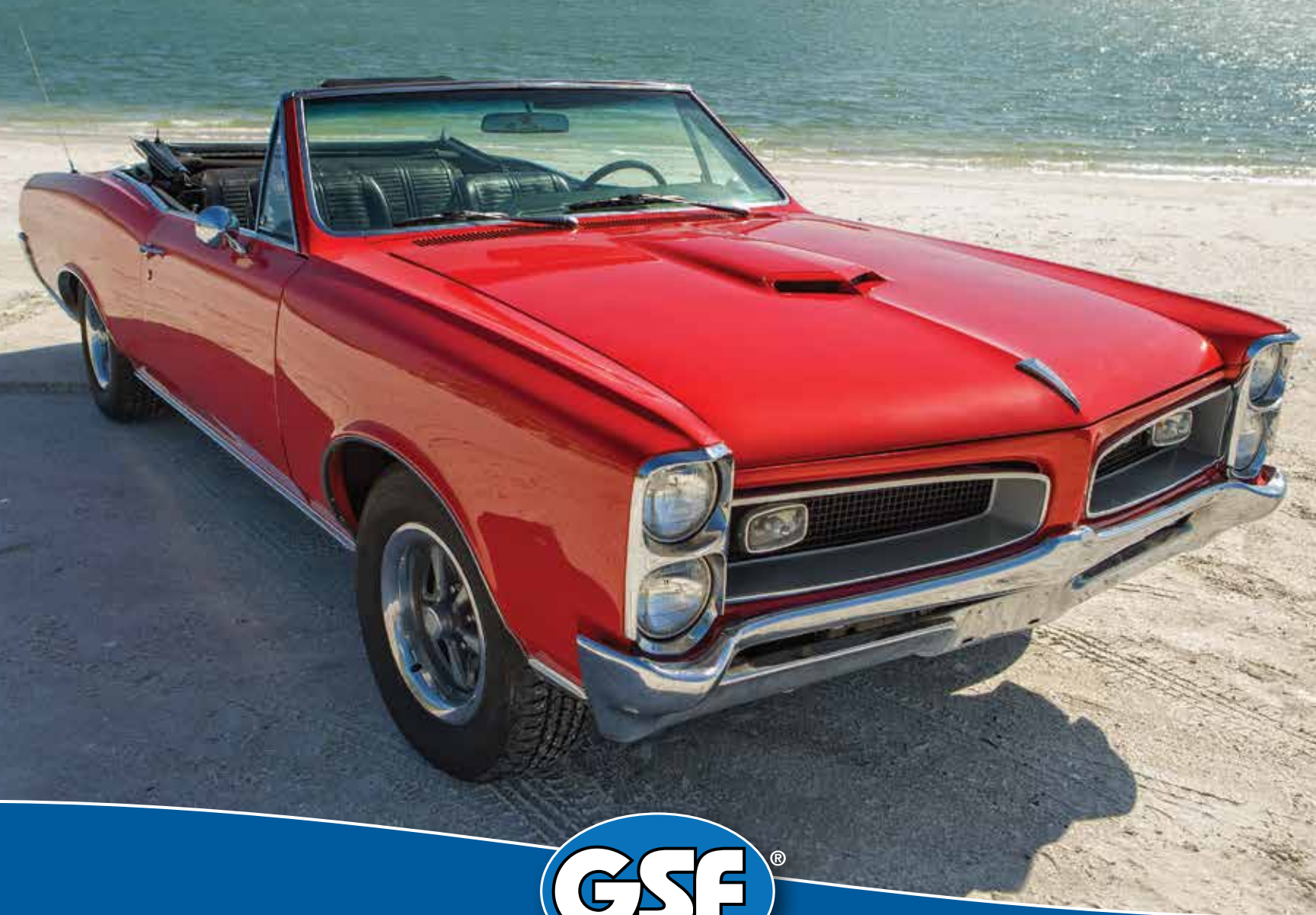
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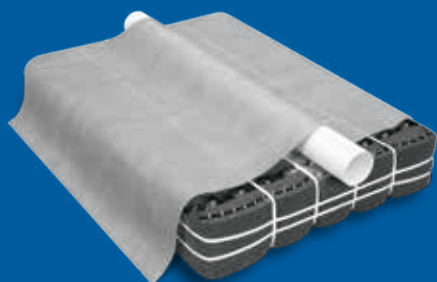


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