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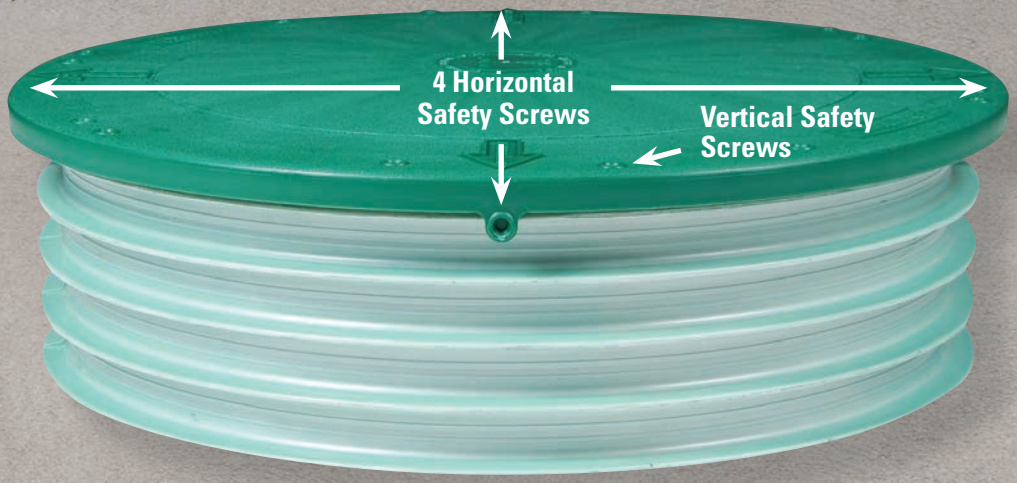

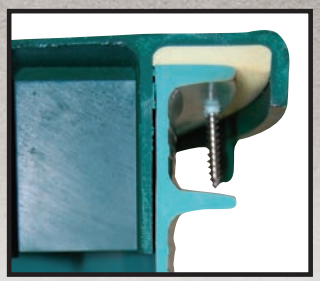

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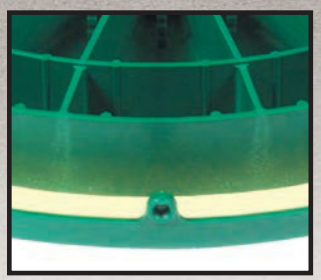

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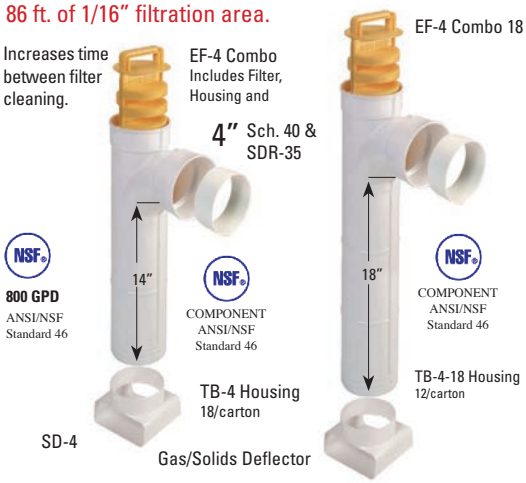

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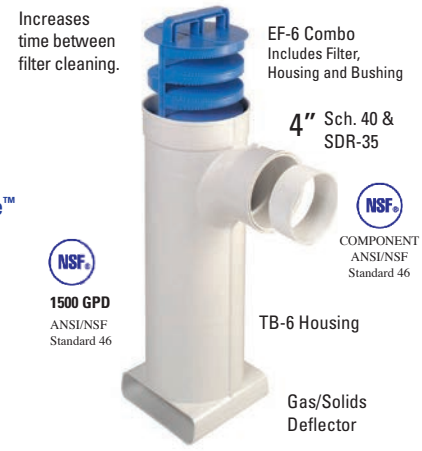

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- Easy to clean

6" Sanitary T-Baffle™

Injection molded T-Baffle™.

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Barry Zink worked 28 years in the onsite installing industry before striking out on his own with Zinks Septic Solutions in Palmyra, New York. With a successful, growing business, he only wishes he'd started sooner. Zink is shown with his International 2554 dump truck with 6-cubic-yard Galion box. (Photo by Mike Bradley)

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June 2017

Jim Kneiszel

'We All Saw a Need and Pitched In'

Illinois onsite contractors and suppliers make a difference in the lives of a family in need

Every now and then, the generous actions of contractors and manufacturers remind me that so many good people populate the onsite wastewater industry. And it happened again recently when I read about a handful of our people in western Illinois who pitched in to build a new septic system for a family left reeling by a rare and devastating disease.

I'd like to share their story, but not to boast about the individuals involved. The guys made it clear from the outset they are uncomfortable getting media attention for their good works. Rather, their story is a reminder of how any of us can have a huge positive impact on the world around us by donating a little of our time and talents. A day's work on the mini-excavator and joining pipes together is routine for these hard workers, but it's seen as an amazing gesture for those on the receiving end of the good deed.

A crew of volunteers including, from left, Nathan Williams, Zach Brown, Caleb DeHamer and Dennis Sullivan installs a new septic system for a family in northwest Illinois. (Photo by Claudia Loucks)

ALLERGIC TO LIGHT

Our story starts last winter with the Fisher family of Geneseo, Illinois: Dustin and Angie, and their two children, Jorden, 11, and Hailee, 5. According to the *Dispatch-Argus* newspaper in the nearby Quad Cities, Iowa, area, Angie is stricken with an illness that attacks her central nervous system and causes seizures. And both kids suffer from a rare genetic blood disease that makes them allergic to light, so they have to live in darkness or their skin and organs are damaged.

Dennis Sullivan, owner of Clean Earth Septic Service in Geneseo, didn't know about the Fisher family's medical challenges when he was called to their house to bid on an addition to their septic system. He was there to figure out how to connect a bathroom that is part of an addition to the house to the existing septic system.

A change in elevation between the addition and the existing septic system would have required a lift station, so Sullivan chose instead to add a separate, small septic system serving only the new bathroom, utilizing a 1,000-gallon tank and 300-foot of absorption field using ADS Ark 24 chambers.

While waiting to get a permit for the new system, Sullivan read a story about the Fishers. At that moment, he decided he would donate the $4,800 onsite system and reached out to his friends and partners in the industry for help. They all were quick to oblige.

Dustin DeKeyrel, owner of Triple D Excavating in Orion, Illinois, offered machines and manpower. Tom Anderson and Steve Elmer, of A & E Soil Consultants, Geneseo, provided the soils testing. Wilbert Vault Co. of Milan, Illinois, discounted the tank. And the men's Bible study group at Heritage Church, where Sullivan is a member, helped out. Sullivan had the chambers, so he donated them along with other materials.

MERRY CHRISTMAS

"It was one of those things where you just have to do something," Sullivan recalls approaching DeKeyrel, who he often teams with on projects. "His guys were slow at that time of the year and I had the rest of the materials in inventory. I said 'You furnish the manpower and machinery.' We all saw a need and pitched in."

The Fishers didn't know about the donation. So Angie Fisher was surprised when she asked how much it would cost before the machines and crew showed up last December.

"It's Christmastime and I don't think you're going to need any money," he recalls telling her. Her gratitude was matched by the good feelings of everyone working on the project.

"It's one of those things that really hits you. I've got to be outside — that's the reason I do what I do. These poor kids, to go outside have to be covered up like it's winter."
Dustin DeKeyrel

"You look at their health history and what's going on with them, and it kind of makes you appreciate the health that you have," Sullivan says. "There's so many facets to having that disability that it just boggles the mind. There are so many things you take for granted and it's just hard to envision."

Sullivan, 69, started his business in 1995 when his own onsite system needed work and he became a licensed installer to complete the work. Previously, he was a union pipe fitter, and started the new career to make some extra money. He mostly pumps tanks and provides point-of-sale septic system inspections.

Sullivan says the job "wasn't a big deal for us, but we got a bigger feeling of gratitude just knowing we did something to help."

DeKeyrel says he and Sullivan were both thinking about donating their time to the family when Sullivan brought it up. The allergy to light and what the children were missing because of it struck DeKeyrel as particularly cruel.

GIVING BACK

"It's one of those things that really hits you. I've got to be outside — that's the reason I do what I do," he says. "These poor kids, to go outside have to be covered up like it's winter. They definitely need help. It's been a strain on the whole family."

DeKeyrel enlisted the help of his installing crew, Nathan Williams and Zach Brown, to complete the job. He started Triple D in 2001 to do construction site work, and septic installations have gradually grown into the biggest part of the business.

The onsite industry has been good to DeKeyrel, and he says it's important to share that success with the community.

"The whole point of this is not just to make money. If we can give a little bit of that back, it's perfect for me," he says. "That's what we're here for, to help other people."

The Fishers are planning to have a party this summer and invite all the folks who helped out with the project. Angie told the newspaper that the family is grateful for the donated system.

"I am so thankful for all the people who have helped us," she said. "With all the bad going on in the world today, what a blessing it is to know there are people out there who care, and step up and make a difference."

SHARE YOUR STORY

In this case, those people are *our* people. If you have a story to share about partnering with others in the onsite community to help a good cause or someone in need, I'd enjoy hearing about it. It's refreshing to dwell on those "good news" stories and highlight the pride installers take in their profession.

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

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SOIL CONCERNS

What to Avoid

It's important to protect the installation site and prevent compaction of the soil treatment area. When soil characteristics are not interpreted correctly, they can negatively impact long-term performance. Jim Anderson discusses some of the potential soil problems an installer can control. onsiteinstaller.com/featured

Overheard Online

"Homeowner education needs to stress they can help or hurt their system by how much water they use."

- Onsite System Management Starts With the Homeowner

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TOUGH JOB

Fixing Failing Systems

Cover star Barry Zink does a lot of work finding solutions for failing septic systems in the Finger Lakes region of upstate New York. In this exclusive online story, we cover an emergency project Zink took on last winter, replacing systems on adjoining properties on Canandaigua Lake. onsiteinstaller.com/featured

ALL ABOUT SAND

Sizing a Soil Treatment Area

A common mistake made during onsite system installations is misidentifying soil characteristics, which results in the wrong type of system or the wrong size system being installed. Here our expert discusses a few of the common soil identification problems and how they impact system performance. onsiteinstaller.com/featured

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AN UPHILL BATTLE

The challenging topography in New York's Finger Lakes region tests the men and machines of Zinks Septic Solutions

By Scottie Dayton | Photos by Mike Bradley

Earning a degree in petroleum technology prepared Barry Zink for various jobs in the oil and gas industry. However, when he arrived in Alaska in 1985, oil prices were plummeting and major energy companies weren't hiring. "I never used my degree," says Zink.

He returned home to Palmyra, New York, and worked for 28 years as an onsite installer before opening Zinks Septic Solutions in April 2014. "I wish I'd struck out on my own much sooner," says Zink, 52. "I doubled the number of installations in the second year, enabling me to hire two employees."

The company hit another milestone in 2016, replacing 40 mainly conventional systems and installing five new. This year's business prospects suggest even greater growth.

IN THE GROOVE

Zink cut his teeth in the construction and onsite fields while in school. His aptitude for machines soon made the work second nature, and he liked that level of proficiency. So did his father-in-law, who was struggling to find and keep good employees in the pumping and septic company for which he worked. "I stayed with them for 22 years, but moved on when the onsite branch was eliminated to expand the business in other areas," says Zink.

Zink worked six years for another septic company, continually enlarging his network of local health department personnel, engineers, contractors and developers in Monroe, Wayne, Livingston and Ontario counties. Whenever clients asked them to recommend an installer, Zink's name was always in the mix. The volume of work generated by

<< Barry Zink, right, and Randy Seavert pose in the company yard with the workhorse equipment, including a Kubota l45 loader/backhoe, a Chevy pickup, an International carrying a Galion dump box, and a Bobcat E55 excavator.

>> Barry Zink digs a trench using a Bobcat E55 excavator.

referrals convinced Zink to fly solo.

"My niche is installing onsite systems, often in places other contractors won't touch," he says. Zink works primarily in the Finger Lakes region on tight lots with steep slopes. Soils include well-drained glacial outwash and till, heavy clay, shale and loam.

Zink opened his company in a hurry. He hired an attorney familiar with the construction industry to form an LLC. Then he bought a 3500 Chevrolet van with Supreme Corp. box body, an International 2554 dump truck with 6-cubic-yard Galion box, a Talbert AC10 tag trailer, a Kubota L45 loader/backhoe, and a Spectra Precision/Trimble LL-300 laser. Zink rented excavators until he knew what size he really needed.

Acting on the advice of other business owners, Zink hired an accountant specializing in construction. "You don't want a friend who is an accountant or the typical certified public accountant," he says. "You want someone who not only looks at the bottom line, but who analyzes industry trends. That person is a sound judge of when I should buy equipment or proceed with other ideas."

Although New York State has no onsite license requirements, Zink takes courses during Education Day at the WWETT Show and attends classes offered by county health departments. "Staying abreast of the latest industry advancements enables me to better serve my customers," he says.

For example, a homeowner asked Zink to bid on an engineer-designed mound system. After evaluating the work, he determined an Advanced Enviro-Septic (AES) treatment system (Presby Environmental) was a better fit. "I spoke to the engineer in depth and convinced him," says Zink. "The client was thrilled because I saved him lots of money that would have gone for fill."

SPREADING THE WORD

Despite Zink's network and numerous referrals, his biggest concern the first year in business was low name recognition, so he spent some money on print advertising. Sheelah, his wife and office manager, developed the company website. Then Zink found LocalVox Media, a digital best-in-class marketing platform that helps local businesses publish promotional material.

Zinks Septic Solutions

Location:	Palmyra, New York
Owner:	Barry Zink
Years in business:	3
Employees:	2
Specialty:	Onsite installation and maintenance, camera inspections, pipe cleaning, challenging site consultations
Market area:	Monroe, Wayne, Livingston and Ontario counties
Website:	www.zinkssepticsolutions.com

Randy Seavert, left, and Barry Zink cut the corner on a trench while installing a system near Seneca Lake in Geneva, New York.

The exposure via Zink's numerous illustrated articles on onsite systems and treatment products worked, and the business grew. In 2015, he hired his son, Paul, and foreman Randy Seavert. "Onsite isn't Paul's passion. He's moving on and I'm looking for his replacement," says Zink. "Randy does everything thoroughly. He's dedicated and hardworking."

Onsite projects (95 percent residential) produce 90 percent of Zink's annual revenue. Excavation, site preparation, waterline installation and repair, and downspout and lateral (house to septic tank) maintenance comprise the remainder. New home installs are minimal, because builders typically hire the same contractor for the driveway, waterline, grading and onsite system.

Since systems in the Canandaigua Lake watershed must be engineered designs, Zink works closely with engineering firms, local and county health departments, and George Barden, an inspector for the Canandaigua Lake Watershed Commission. When Barden heard that Norweco was releasing a new phosphorus-nitrogen tank and filter, he asked Zink, a company distributor, to bring him the data. "George will present it to the commission to discuss whether they want the technology installed in certain situations," says Zink.

TOUGH JOBS

He also works extensively with Bill Grove, P.E., of Grove Engineering in Naples, New York. The team has a reputation for cracking the hardest onsite challenges.

"We call time-out on rain days because working on the 20 to 50 percent slopes is too dangerous. If it begins to rain and we're working in silty clay or loamy soils, we stop because the excavator becomes unmaneuverable."

Barry Zink

A recent example was a system replacement for a two-bedroom seasonal lakefront cottage on a steep wooded hill. Access to the site was from a road 80 feet above the lake.

Grove specified a 500-gallon lift station with 2 hp sewage grinder pump (Liberty Pumps) at the cottage. Years ago, road builders had leveled a spot in the hill 40 feet above the home, and Grove set the 1,000-gallon septic tank (tanks by Roth Global Plastics) and AES trenches on it. The elevation from the cottage to the septic tank rose 18 feet in a 45 percent slope.

"Since we couldn't maneuver the E55 Bobcat excavator down the hill, we had to hand-dig the 5.5-foot-diameter 5-foot-deep pump tank hole," says Zink. "The silty loam was the consistency of wet concrete, and the spoil kept wanting to fall down the hill." They also dug the 12-inch-deep trench for the 1.5-inch force main to the septic tank.

To prevent the 225-pound fiberglass pump tank from heeding gravity's call, the crew lowered it with a rope. "Had we lost control, the tank would have bobbed off into the lake," says Zink.

Once the lift station was set, Zink machined down from the road to excavate the hole for the 450-pound 10- by 5- by 4-foot septic tank. He also dug the trench for the supply line, prepared the drainfield site, and leveled an area uphill to stage the system sand.

"The driver of the slinger truck shot the sand over the bank and right on target," says Zink. Using a Kubota 75 tracked skid-steer, Paul Zink transferred the sand to the Bobcat excavator driven by his father and he placed it in the drainfield. Then Seavert leveled the sand. The normal two-day installation on the flat took four days.

Barry Zink, in the Bobcat excavator, and Randy Seavert move a Norweco Singulair Green unit in the company yard.

GRAVITY RULES

Another team project involved a five-bedroom lakefront home with a sound 1,000-gallon steel septic tank and failed drainfield. The installer, hired by an excavation contractor, looked down the 50 percent slope and said he had no idea how to attempt the job. The contractor called Zink.

He proposed modifying the septic tank into a lift station by having Liberty Pumps fabricate a fiberglass basin to fit inside it. However, the basin would not have the capacity for 500 gallons plus storage. Grove and Barden agreed with Zink to use duplex 2 hp pumps and a control panel (Liberty Pumps) to meet demand.

"Now I didn't have to take the excavator down there to dig a new hole," says Zink. "We rolled the basin to the tank, stuck it in, and there was our lift station."

Barry Zink uses a Spectra LL-300 laser during an installation project.

FACING SEASONAL CHALLENGES

Weather plays a major role in installing onsite systems in New York's Finger Lakes region. "We call time-out on rain days because working on the 20 to 50 percent slopes is too dangerous," says Barry Zink, owner of Zinks Septic Solutions. "If it begins to rain and we're working in silty clay or loamy soils, we stop because the excavator becomes unmaneuverable."

Even mild winters limit installation opportunities. Slopes become slick and thaws make materials wetter than normal. Trucks laden with sand or stone are too heavy to reach systems without damaging lawns or bogging down. "Over the 2016-'17 winter, we installed 10 systems and replaced four septic tanks, and all were on the flat in sandy or gravely soils," says Zink.

The irregular fieldwork enables Zink's crew to service 15 maintenance contracts on aerobic treatment units, replace pumps (more fail in winter than in summer), and cracked or collapsed concrete distribution boxes. The crew also inspects and cleans laterals from the house to the septic tank and drainfield supply lines using a Viztrac AM-200-100 camera with sonde (Amazing Machinery) and RIDGID K-3800 power snake.

The next morning, Paul Zink and Seavert hand-dug a 12-inch-deep trench for the 2-inch force main 210 feet to the base of the new asphalt driveway. The area averaged a 25 percent slope with sections of 30 percent slope.

To avoid damaging the drive, Zink hired Keith Burrows of Burrows Bros. to bore under the steep bank supporting it. Burrows tracked the remote-control driven JT2020 Mach 1 Ditch Witch down the driveway, then realized that once he'd maneuvered over the drive's drainage ditch, there was nowhere to set the drill. "I hadn't taken that into consideration, so we hand-dug a level spot into the bank," says Zink.

The 30-foot bore went smoothly. From the driveway, the grade rose even steeper as Paul Zink and Seavert dug the force main trench 120 feet to the septic tank's location. Meanwhile, Barry Zink fought the Bobcat excavator up the hill and dug the hole for the 14- by 5.5- by 4.25-foot TW-1500 tank (Infiltrator Water Technologies). The excavation was three times as deep on the steep side of the hill.

The men secured the 581-pound tank with a rope, then lowered it over the bank. Zink helped control and slow the tank's descent with the excavator bucket until able to lift and set it.

ONE FOR THE BOOKS

As Zink prepared the drainfield site, softball- to basketball-sized rocks in the spoil rolled down the hill, smashing through silt fences 15 feet below and landing on the driveway close to the house. "To avoid a major rock catastrophe, we built a berm with the excavator to trap them," says Zink. "I've never encountered that situation before."

"Backfilling the system and making the final grade and slopes without driving on the bed was tedious work. I constantly thought about where to position the soil and how to grade it, while working backward toward the only spot on the hill where I could get out."
Barry Zink

Once again, the slinger truck driver launched system sand some 40 feet down from the road and directly into the bed. After the crew lay 350 feet of AES pipes in the drainfield, the slinger covered them with a layer of sand. A total of 80 tons was required.

"Backfilling the system and making the final grade and slopes without driving on the bed was tedious work," says Zink. "I constantly thought about where to position the soil and how to grade it, while working backward toward the only spot on the hill where I could get out."

As he cut into the berm to use the soil for backfill, Paul Zink and Seavert caught dislodged rocks on the move. "One got away from us and hit a tire on my truck," says Zink. "A hit on the body would have obliterated it."

The soft soil made the excavator want to slide down the hill. Zink fastened his seatbelt, and trusted his son and Seavert to watch for signs that the soil was giving way too much. The project took five days instead of 3 1/2 days on the flat.

Zink's expertise in solving difficult situations ensures an overflowing service board. He plans to grow the business to just five employees. "I can control what happens at that size," he says. "The most important things are keeping my good name and doing quality work."

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Maryland Considers Return of Best-Technology Rule for Onsite Systems

By David Steinkraus

The state that surrounds most of Chesapeake Bay, where struggles over water quality have occupied public attention for several years, may revive a rule to require the best available onsite wastewater technology everywhere.

A regulation created by the administration of former Gov. Martin O'Malley in 2012 required best-available technology for all new construction across the state. Current Gov. Larry Hogan reversed the O'Malley regulation last summer. That means best-available systems are required only in environmentally critical areas, defined as coastal lands or lands within 1,000 feet of the bay.

State Sen. Joan Carter Conway introduced a bill to write the O'Malley regulation into law, but the bill is struggling in the Maryland Senate. The bill failed to pass a committee by one vote, but then one legislator asked the committee to reconsider its vote.

Opponents of the idea question the need to have homeowners pay for best-available technology on land that may be 25 miles from coastal areas. For example, in voicing its opposition, the Worcester County Commission said requiring best-available technology could add as much as $15,000 to the cost of a home. The county lies along the Atlantic Ocean shore on the eastern side of the Delmarva Peninsula, which contains most of Delaware and forms the Chesapeake Bay on its western side. Supporters of the rule say the nitrogen removed by best-available systems is one of the major pollutants in the bay and say Hogan's action was a concession to developers and rural landowners.

In the meantime, the Harford County Council is preparing legislation that would remove the need for best-available systems on any land outside the environmentally critical areas. The county sits on the northwestern end of Chesapeake Bay not too far from Baltimore.

If the Senate bill becomes law, money from a special fund would subsidize the approximately $7,500 cost difference between a conventional wastewater system and a best-available system. The bill also proposes an $8,000 fine for any home not using a best-available system where one is required.

Oregon

Vagueness in the law stopped one wastewater operator's plans, but the issue may now be clarified for everyone by the state Legislature.

Wayne Buma, who operates AAA Septic Cleaning in southern Oregon, wanted to process septage and spread the resulting product on farmland as fertilizer. The Jackson County government objected — not on the grounds of public health, but because the state's land-use law is unclear. The county said it is not certain whether treatment is allowed on land zoned exclusively for farm use. Generally, state law allows processing only in urban areas, which would increase Buma's hauling cost.

HB 2179 would clarify the law and allow treatment of biosolids on farms provided the processing is done with mobile equipment. Without the clarification, Buma would have to process wastewater at the location of each tank he pumps. His process involves screening septage to remove debris, then adding lime to change the pH and kill pathogens.

Florida

Algae blooms were a problem in Florida last summer, and now are the target of special funding in the state budget.

Republican Gov. Rick Scott included $40 million in his proposed budget for a matching grant program to help people in communities affected by algae blooms. The money will aid people in converting from septic tanks to municipal sewer. At the peak of the problem last summer, Scott promised to seek money to help remedy it.

Meanwhile, state Rep. Charlie Stone, R-Ocala, sponsored a bill calling for $20 million from the state's conservation fund to help property owners improve onsite wastewater systems or connect to sewers. That bill is presently going through the committee process.

New York

A supervisor in the town of Southampton on Long Island said he expects his community to follow the lead of East Hampton and require nitrogen-reducing wastewater systems for new construction. Supervisor Jay Schneiderman said revised codes will require such systems only where pollution could reach bays and ponds.

The town will also work on rebate programs to encourage homeowners to replace older systems with the latest technology. Money would come from the town's Community Preservation Fund, which is supported by a fee on real estate transactions.

Homeowners in East Hampton are eligible for payments of $5,000 to $15,000 depending on household income and what system is in place now.

Indiana

Commissioners in Brown County are working through a complete overhaul of the county septic system ordinance. The county is about 30 miles south of Indianapolis.

The rules have not been revised since 1997. A revision was passed in 2013, but that was challenged with a lawsuit, and a court negated the rules after finding the county's work had not been properly advertised to the public.

Most areas of the county depend on onsite systems, and under the draft most homeowners would not see any effect from the law unless they add to their home, sell the property, or have a failing onsite system. A draft of the new ordinance requires an inspection of the system when a property is sold.

John Kennard, a county environmental health specialist, said a random sample of 10 local real estate listings found that six had systems too small for the number of bedrooms detailed in the listing.

Among other changes, the draft ordinance contains rules specific to guest rentals such as bed-and-breakfast establishments, lays out a procedure for evaluating drainfield sites, and sets rules for holding tanks.

Canada

Two governments at opposite ends of Canada are grappling with the maintenance of septic systems.

In Central Frontenac Township, Ontario, located about 60 miles southwest of Ottawa, the nation's capital, the town council approved a septic inspection program. The township is located on Sharbot Lake, a large body of water in eastern Ontario.

Property owners will be required to have a licensed pumper inspect onsite systems and report the results to the township. The inspection can take place during a regular pumpout. Property owners must have an inspection on file every five years.

Township Councillor Victor Heese said research by a council committee found only 2 to 4 percent of onsite systems required a major repair or replacement. The council also formed a committee to investigate financial assistance for homeowners unable to pay for system repairs or replacement.

On the other end of the country, the Comox Valley Regional District is considering a mandate to maintain septic systems. The district, which incorporates several local governments, is located on Vancouver Island about 100 miles northwest of the city of Vancouver.

Engineering staff will first work on a public education program to be approved by elected officials this spring. The staff will also investigate a mandatory maintenance program. According to a member of the staff, only the government district around the provincial capital of Victoria has a mandatory maintenance program. That program includes fees to recover costs and a requirement for regular reporting.

Jim Anderson, Ph.D., and David Gustafson, P.E., are connected with the University of Minnesota onsite wastewater treatment education program. David is extension onsite sewage treatment educator. Jim is former director of the university's Water Resources Center and is now an emeritus professor. Readers are welcome to submit questions or article suggestions to Jim and David. Write to ander045@umn.edu.

Nobody Wants to Cut Down Trees, But ...

Root intrusion can pose a serious threat to the long-term viability of a new septic system. Assess the design plan and property to determine if tree removal is necessary.

By Jim Anderson and David Gustafson

It seems every year we receive questions about what to do about trees growing on and around septic system components, most often the drainfield area. One question was whether trees survive if they are in contact with fill used to complete mound construction.

The direct answer is no, they will not survive if fill is brought up around the tree and the bark is in direct contact with soil. It may take a year or two but a fungus will develop in the bark and ultimately the tree will die. In other landscaping situations, trees can be protected from this fate by creating an open area around the base of the tree out of rocks or interlocking landscape blocks. If the bark is open to the air the tree should be able to survive if it or its root system has not been damaged during the installation process.

The larger question is whether the trees should be left in the mound or the drainfield for belowground systems. There are a couple of issues of concern about leaving trees in the area. First, root intrusion may threaten any of the system components. Second, when the tree or trees shade the area, it may be difficult to establish and maintain any other type of vegetation, which leaves the site subject to erosion, particularly for above-ground at-grades and mounds.

TREE SPECIES PLAYS A ROLE

For mounds and at-grades, our recommendation has always been that the trees should be removed from the area under the footprint of the mound. A potential exception to this would be when the fill extends beyond the typical footprint to cosmetically blend the mound into the landscape.

Type of tree and the site characteristics will help direct the decision whether to keep the tree or not. Trees that are water-seeking/loving and will send roots out in search of water should be removed due to the root intrusion concerns. Where we live, this includes species like white pine and sugar maple. These trees should also be 20 feet or more away from any sewage tanks or other system components to reduce the potential for root intrusion.

We should mention that these are the very kinds of trees that homeowners do not want to lose out of their yards! Before work starts, it is important to explain with them why the trees need to be removed. We have seen more than one irate homeowner rip into an installer because they did not realize their trees would be removed during installation.

For mounds and at-grade systems, tree removal should consist of cutting them off as close to the ground as possible and leaving the remaining stumps in place, with the soil around them scarified and sand fill placed over the top. This is to protect the infiltrative surface of the soil from smearing or compaction reducing the infiltrative capacity of the soil.

Assess trees in the vicinity of belowground drainfields to determine if they will limit your ability to excavate or place trenches in the right location and if they pose the potential to interfere with piping or parts of the system. In gravity-fed trench systems — where we rely on development of the biomat for distribution of effluent — trees can be closer to the trench. Roots will generally not enter the trench when it is dry since there is no water or nutrients, and they won't enter when the trench contains sewage because it lacks oxygen.

Before work starts, it is important to explain with them why the trees need to be removed. We have seen more than one irate homeowner rip into an installer because they did not realize their trees would be removed during installation.

The decision about keeping trees next to gravity trenches comes down to whether the tree is in the way of installation or so close that the root system will be irreparably damaged during excavation and will ultimately die due to the disturbance.

LIMIT COMPACTION

Stump removal depends on the location of the system and site characteristics. Three methods to remove stumps are stump grinding, hand digging or using a backhoe. Stump grinding will remove the upper portion of the stump but may not remove the root parts deep enough to excavate. Hand digging is very hard and difficult work. And no, a half a stick of dynamite is not a solution! Using the backhoe is what we have seen done most often.

With any of these methods, the key is to limit potential compaction that will affect the infiltration area of the system. If it cannot be done without damaging the drainfield area, stumps should be left. Also note that the

objective is not to remove all tree roots. Depending on the tree size, root systems can be extensive. The stump should be removed to a depth of about 12 inches and the rest of the roots left to decay naturally over time.

Another side note is that in some regions numerous large rocks will be found, such as northern parts of the country that were glaciated. Decisions need to be made on removal to facilitate installation. The same precautions of not smearing and compacting the treatment area apply. Where possible they should be left in place and worked around. If the area is over-excavated due to rock removal, additional fill will be needed. Typically, clean sand is used as the replacement fill, but, as usual, know your local regulations and requirements.

Septic Tanks 2017

BRAND	MATERIAL	CAPACITY (GALLONS)	DIMENSIONS	WEIGHT (LBS)	COMPARTMENTS	INLET (ALL)/ OUTLET (BLL)	CERTIFICATION
CONCRETE TANKS							
Jet Inc. 750 Alpha Dr., Cleveland, OH 44143 800-321-6960 440-461-2000 Fax 440-442-9008 email@jetincorp.com www.jetincorp.com See ad page 34	Jet	Concrete	500 - 1,500	120"l x 59"w x 69"h	10,000	3	56"/53"	NSF 40, 245 & 350
National Precast Concrete Association 1320 City Center Dr., Ste. 200, Carmel, IN 46032 800-366-7731 khanson@precast.org To Access Our Tank Producer Search, Go To: www.precast.org/tanks See ad page 39	Various	Concrete	Varies with Producer	Varies with Producer	Varies with Producer	Varies with Producer	Varies with Producer	Varies with Producer
Wieser Concrete W3716 US Hwy. 10, Maiden Rock, WI 54750 800-325-8456 715-647-2311 winkler@wieserconcrete.com www.wieserconcrete.com See ad page 31	Wieser Wieser Wieser	Concrete Concrete Concrete	1,600 10,000 (Hs20 rated) 40,000	84"l x 145"w x 53 1/4"h 120"l x 192"w x 126"h 168"l x 480"w x 140"h	10,250 base 6,350 lid 35,975/section 70,000/section	3 Adjustable Adjustable	Adjustable Adjustable Adjustable	NPCA Certified NPCA Certified NPCA Certified
POLY TANKS							
Infiltrator Water Technologies 4 Business Park Rd., Old Saybrook, CT 06475 800-221-4436 info@infiltratorwater.com www.infiltratorwater.com See ad page 3	IM-540 IM-1060 IM-1530	Polypropylene Polypropylene Polypropylene	500 1,050 1,500	65"l x 62"w x 55"h 127"l x 62"w x 55"h 176"l x 62"w x 55"h	191 346 501	1 1 or 2 1 or 2	47/44 47/44 47/44	IAPMO IAPMO IAPMO
Jet Inc. 750 Alpha Dr., Cleveland, OH 44143 800-321-6960 440-461-2000 Fax 440-442-9008 email@jetincorp.com www.jetincorp.com See ad page 34	Jet	Polyethylene	500 - 800	121"l x 62"w x 70"h	1,000	3	59"/56"	NSF 40, 245 & 350
Premier Tech Aqua 1, avenue Premier, Riviere-du-Loup, QC G5R 6C1 Canada 800-632-6356 418-867-8883 Fax 418-862-6642 pta@premiertech.com www.premiertechaqua.com See ad page 8	PTA-1500 PTA-3000 PTA-5000	Polyethylene Polyethylene Polyethylene	3,900 7,900 13,200	15'10"l x 7'8"w x 8'10"h 27'l x 7'8"w x 8'10"h 52'10"l x 7'8"w x 8'10"h	1,620 2,881 4,768	1 to 2 (or more) 1 to 3 (or more) 1 to 5 (or more)	76 3/4"/ 74 1/2" 76 3/4"/ 74 1/2" 76 3/4"/ 74 1/2"	
Roth North America PO Box 245, Syracuse, NY 13211 888-266-7684 315-475-0100 Fax 315-475-0200 sales@roth-usa.com www.roth-usa.com See ad page 31	Roth MultiTank	Polyethylene	300 - 1,500			1 or 2		NSF, CUPC, IAPMO
Snyder Industries, Inc. 6940 "O" St., Ste. 100, Lincoln, NE 68510 402-467-5221 Fax 402-465-1220 sales@snydernet.com www.waterandseptictanks.com See ad page 9	Snyder NexGen D2 Snyder NexGen D2 Snyder NexGen D2	Polyethylene Polyethylene Polyethylene	1,000 1,250 1,500	127"l x 61"w x 51"h 157"l x 61"w x 51"h 157"l x 69"w x 51"h	350 420 550	1 or 2 1 or 2 1 or 2		IAPMO/Most States IAPMO/Most States IAPMO/Most States

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SYSTEM PROFILE

With the base in place and the seal applied, the walls of the Wieser Concrete vault for the MBR system is set in place. Together the vault weighed 126,000 pounds and had to be shipped on two trucks. (Photos courtesy of Ray Tebo)

The Big Muddy

A shipping depot located on the vast Mississippi River floodplain called for onsite system design creativity

By David Steinkraus

In the commodity business, the Mississippi River is a place to be. This is where grain from Midwest farm fields is collected and loaded onto barges that haul harvests along the nation's major rivers. Louis Dreyfus Co. wanted to be here. It planned a large grain storage and shipping depot in Cahokia, Illinois, on the bank of the Mississippi and opposite St. Louis. But there was a problem with the site: The river's floodplain included the entire parcel of chosen land.

Compounding this was a recent rule change in Illinois that forbids the long-term use of holding tanks. They may still be used, but for no more than 12 months. The company did not want long-term use of portable restrooms, but prospects looked poor for a permanent wastewater solution.

"From a waste standpoint it was straightforward," says Ray Tebo of New Excavating Technology in St. Anne, Illinois.

The only building on the site at the time was an office structure about 70 feet long and 18 feet wide. It is filled with computer stations for the company's workers, but it is also elevated 8 feet above grade on stilts. There are two reasons for this. One, if the site floods the building will be above it. Second, the workers inside can look down on the truck scales and loads of grain coming onto the property. Two restrooms and a small kitchen are the only wastewater sources.

"It took a long time to get all the permits. ... It was crazy how well it went together, but we planned for this for about a year."

Ray Tebo

No soil and high water

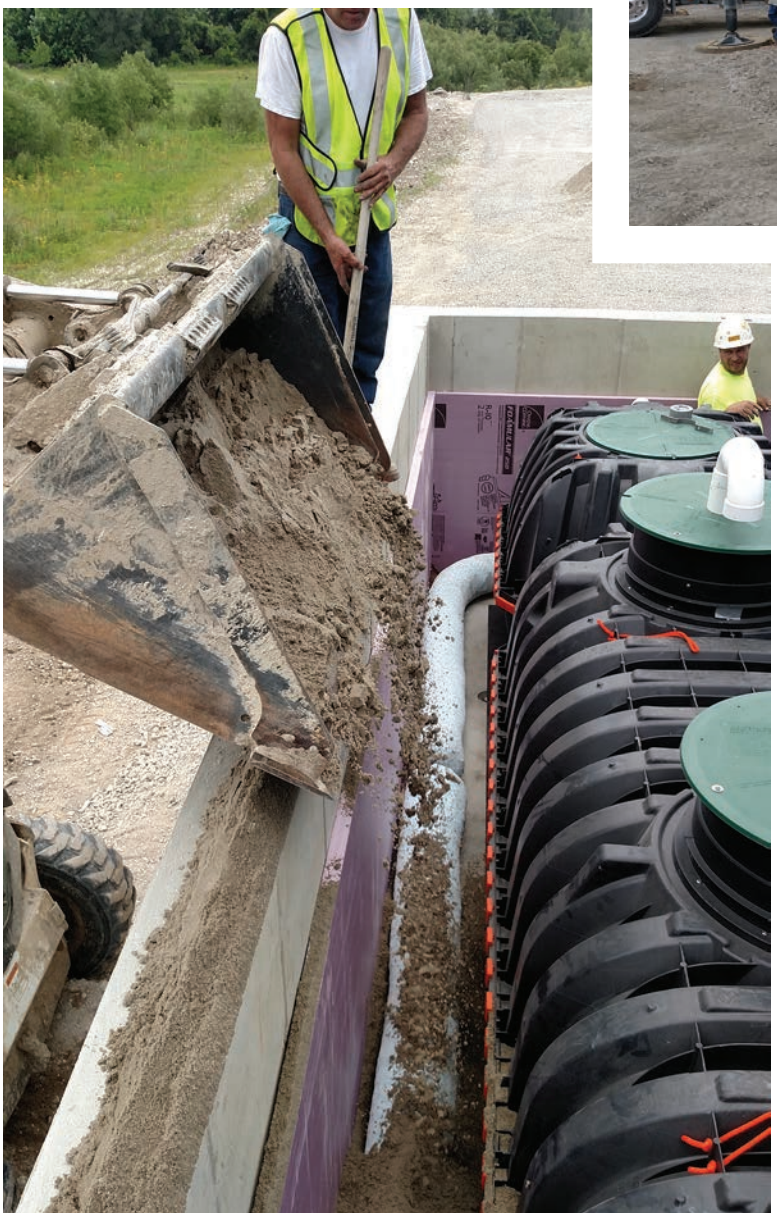
The job started when Tebo received a call from an engineer for Dreyfus. Although it was 250 miles away, far from his normal radius of operations, Tebo agreed to look at the project.

"The site had nothing but 30 or 40 feet of fill, and it was like that over all 27 acres," he says.

The engineer explained the plan for the building and said a standard septic system wouldn't work. Plans called for the finished site elevation to be 6 inches above the floodplain. That elevation is also the 100-year flood mark. Building up the grade by several

With the base settled on its pad and sealant in place Gregg Bickus, left; Krzysztof Matczuk, second from right; and Wayne Street, right; settle the walls of the vault for the MBR into place.

With the tanks and Bio-Microbics MBR in place, Wayne Street, left, and Gregg Bickus, right, fill the concrete vault with sand to protect the system from cold. Rigid insulation panels do the same, and at the bottom of the vault a perimeter drain collects water seeping through the fill.



System Profile

Location:	Cahokia, Illinois
Facility served:	Louis Dreyfus Co. grain shipping depot
Designer:	New Excavating Technology Inc., St. Anne, Illinois
Installer:	New Excavating Technology Inc., St. Anne, Illinois
Type of system:	Bio-Microbics MBR set in above-ground concrete vault
Site conditions:	Mississippi River floodplain with fill
Hydraulic capacity:	1,000 gpd

feet to allow for proper separation between a drainfield and the water table would have involved a large cost the company didn't want to pay, and the company wanted to keep the entire property covered with gravel to provide maximum maneuvering room for trucks.

Tebo proposed a membrane bioreactor because its very clean discharged water would pose no environmental hazard. Permit limits for the project are: BOD of 45 mg/L, TSS of 45 mg/L, and 400 cfu/100 mL on fecal coliform.

Out in plain sight

Wastewater leaves the office building in a 4-inch Schedule 40 PVC pipe that drops a few feet before entering a 10- by 25-foot concrete vault that holds the wastewater system.

First in line is a trash tank, an Infiltrator Water Systems IM540 540-gallon plastic tank with a 1/8-inch slotted Bio-Microbics SaniTEE effluent screen on the outflow to intercept debris. Next, the water flows into a 1,530-gallon Infiltrator IM1530 tank that holds the BioBarrier MBR. A pump supplied by Bio-Microbics, and switched on and off by a float, pulls water through at a rate of 1/2 gpm. A Bio-Microbics panel controls the system.

The vault was an installation job in its own right. Workers putting up the office building added in compacted gravel to the grade Tebo specified. The vault's walls are about 10 inches thick and the floor is about 12 inches thick. It was made by Wieser Concrete, and came in two pieces — base and walls — on two trucks. A crane put the 126,000-pound vault together.

Against the inside walls of the vault are 2-inch hard insulation panels designed for underground use. Around the bottom is 4-inch drain tile wrapped in 10-inch drainage EZflow to collect water running down inside the vault.

"The site had nothing but 30 or 40 feet of fill, and it was like that over all 27 acres."

Ray Tebo

The inside of the vault is filled with about 5 feet of sand to insulate components from cold weather. On top of the sand is landscape fabric to prevent weeds from taking root, and on top of the fabric is 1 foot of clean 1-inch stone.

Tebo offered to disguise the vault with a roof or shed, but the owners were happy with having the vault exposed.

The 4-inch discharge pipe from the MBR goes through the wall of the vault, turns 90 degrees, and falls about 4 feet to join the 4-inch pipe from the interior-perimeter drain. About 40 feet from the vault the pipe discharges water onto the surface of the ground.

In the middle of that 4-foot drop technicians installed a breakaway section. This serves two purposes. First, it allows technicians to sample discharge water from the MBR. Second, in the event the site does flood, that section of pipe can be removed to prevent floodwater from backing up into the MBR.

Good planning means quick work

"It took a long time to get all the permits," Tebo says. In addition to an NPDES permit for surface water discharge, the local health district had to give approval, but had never overseen such an installation. The Illinois state Health Department had to give permission, as did the U.S. Army Corps of Engineers.

But the project itself went smoothly.

"It was crazy how well it went together, but we planned for this for about a year," Tebo says.

Treated water from the MBR falls onto a stone about 40 feet from the edge of the vault. The same pipe also discharges water collected by the perimeter drainpipe inside the vault. Notice the breakaway section in the pipe on the side of the MBR. This allows technicians to sample treated water from the MBR, and in case of a flood the pipe can be removed to prevent water from backing up into the bioreactor.

Wayne Street does finish work on the MBR vault. With the stone in place the system blends in with the rest of the grain depot site.

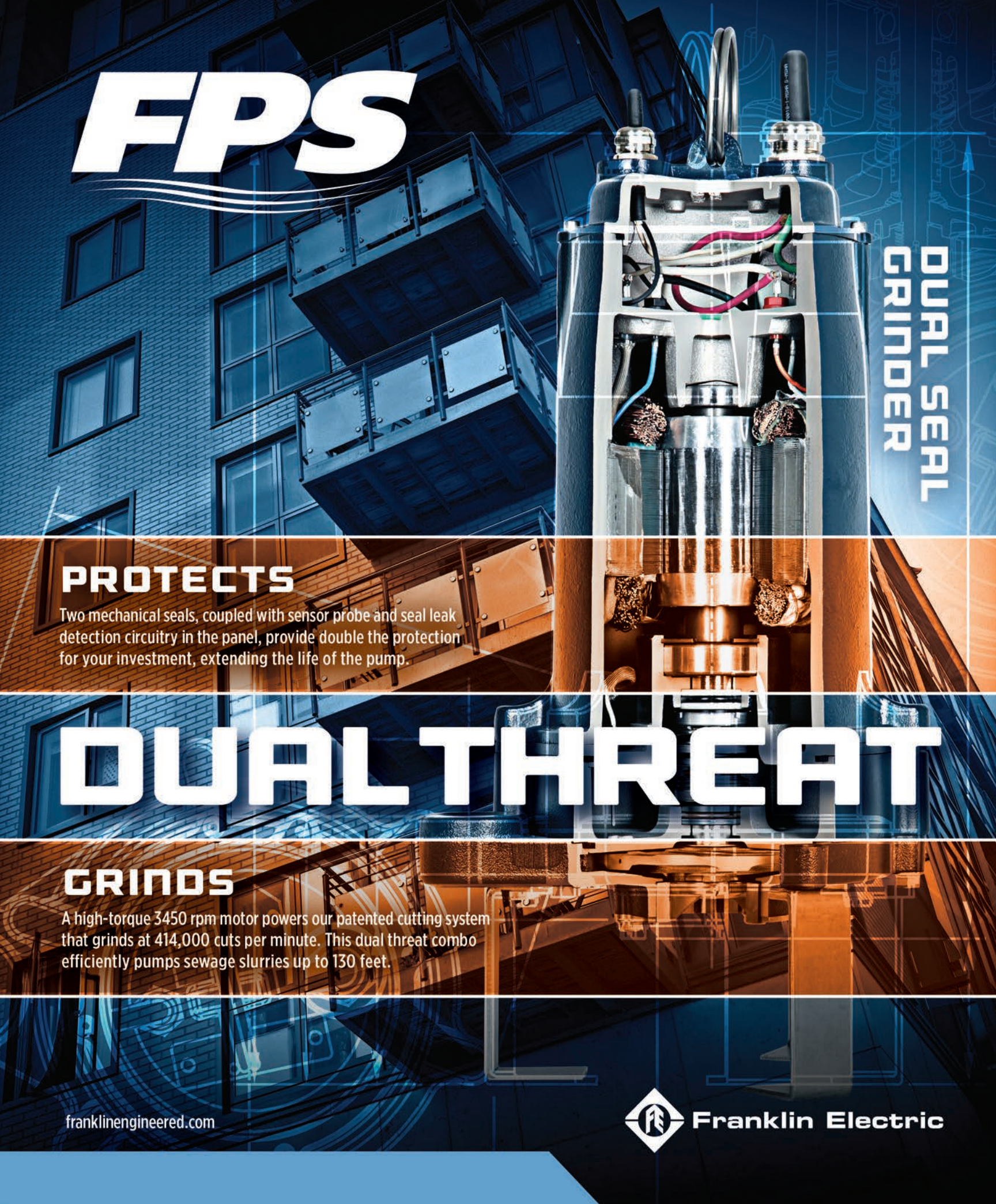
He and his technicians knew the dimensions of the concrete vault, so inside their MBR shop they build a mock-up of the design using a plywood box built to the interior dimensions of the concrete vault. When they drove to Cahokia, they hitched an 18-foot double-axle aluminum trailer to Tebo's 1/2-ton Dodge Ram EcoDiesel pickup and on that put the two plastic Infiltrator tanks. Another Dodge Ram carried the technicians, tools, and smaller components.

Workers building the Dreyfus facility had a Bobcat skid-steer on site, and they let Tebo's technicians use it for a small bit of finish grading on the vault pad and for filling the inside of the vault with sand and stone.

"We drove down one morning loaded, and we were on the road home at 1 p.m. the next afternoon. On the night in between we went to a Cardinals game in St. Louis," Tebo says.

The first day was for setting the vault and installing the tanks. Next morning the crew installed the electronics and started up the system. Technicians from New Excavating Technology still return quarterly to check the parameters and operation of the system.

Louis Dreyfus still has to ship in freshwater to run its bathroom because the local health department does not allow well drilling in the Mississippi River floodplain. The company put in a holding tank that is filled periodically. But with modern wastewater technology the company can do business where it needs to, and it can do that business without harming the river its business depends on.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Business is a Mad Dash for Scott Kellogg

'It's like they open the gates at 6 a.m. every morning and it's a full-out sprint like the Kentucky Derby all day long until I climb back into bed'

Compiled by Sarah Umhoefer

In States Snapshot, we visit with a member of a state, provincial or national trade association in the decentralized wastewater industry. This time we learn about a leader in the Colorado Professionals in Onsite Wastewater.

Scott Kellogg on the job

Scott Kellogg

Business: Douglas County Septic – Franktown, Colorado
Age: 49
Years in the industry: 17

Association involvement:

Member of Colorado Professionals in Onsite Wastewater, served on the CPOW board as state installer representative 2015-'16, member of National Association of Wastewater Technicians, NAWT inspector certified, NAWT installer certified.

Benefits of belonging to the association:

Belonging to CPOW and NAWT allows us to stay current with state regulations, industry changes, and provides opportunity for feedback and communication with other industry professionals as well as regulatory agencies on both state and county levels.

Biggest issue facing your association right now:

Trending environmental issues are causing designers and local governmental agencies to "raise the bar," thus increasing construction costs to homeowners for new and replacement systems. Space is limited for new and replacement systems, thus creating costly challenges for installations. Developers and building departments are not allowing enough space on properties for construction of onsite wastewater systems and need to be educated on regulation requirements encompassing the sizing, setbacks, topography and feasibility of construction of future onsite wastewater systems.

Our crew includes:

Four two-man crews and two office staff.

Colton Mathews is a NAWT-certified inspector. He is our lead maintenance technician, title transfer inspector/vacuum truck foreman. Jason Policarpo is the vacuum truck technician.

Efrain Jimenez is a NAWT-certified installer and is our lead installation foreman. Adrian Hernandez is our installation technician.

Reynaldo Santos is a NAWT-certified inspector and is our lead troubleshooting and repair foreman. Manual Santos is our repair technician

Zach Wilson is our excavation foreman, and Isidro Bocanegra is our primary equipment operator.

Sheri Trehal is coordinator of scheduling, work orders, payroll and accounts receivable.

Kay Kuhl is coordinator of customer service, invoicing and accounts payable.

Typical day on the job:

We have come to the conclusion that there is never a "typical day" in our world. Most days will consist of a well-thought-out and planned schedule that quickly changes in the first hour of the following day when emergencies start rolling in, or equipment breaks down or other issues arise. Phone calls and text messages begin between 6 and 6:30 a.m. communicating with employees, builders and suppliers. Generally, I will try to be on-site meeting with our foreman, reviewing jobs and laying out repairs or system installations between 7-10 a.m. Additionally, by 8 a.m. our office staff will be communicating with me, generally dealing with emergencies that came in overnight and adjusting schedules to prioritize and accommodate customers that need to be addressed before day's end.

The Douglas County Septic crew includes (top row, from left) Adrian Lopez, Zach Wilson, Colton Mathews, Sheri Trehal, Reynaldo Santos and Efrain Jimenez. Kneeling (from left) are Scott Kellogg and Manual Santos. (Photos courtesy of Douglas County Septic)

Running our basement excavation division also takes up a fair bit of time every day as well. I typically try for a minimum of two days per week in the office working on invoicing, estimates and project coordination. As much as many people dislike text messaging and would prefer to talk over the phone, I heavily rely on it and would be lost if it ever went away. I can be communicating with three to four employees and our office staff by a group message letting them know of a change in plans, while at the same time be texting suppliers directions or builders I'm meeting with my ETA. We rely heavily on our field technicians to text pictures of repairs they've completed, site conditions, and other issues that need documentation, which helps keep me from having to step foot on every single job we have going, so I can focus my energy elsewhere.

I generally spend at least an hour or two in the evenings after dinner working on bids and answering emails. I explained to someone recently: It's like they open the gates at 6 a.m. every morning and it's a full-out sprint like the Kentucky Derby all day long until I climb back into bed. It's exhausting at times, but always very rewarding.

The job I'll never forget:

A few years back we received a phone call from a health department official asking if we could assist in cleanup and removal of human waste in a backyard of a high-density residential neighborhood. An elderly lady who had mental impairments had been defecating in her backyard for an extended period of time. The health department had been getting complaints from neighbors and in turn contacted the sheriff department. After carefully planning and coordination with the sheriff and health departments, a search warrant was issued. It was almost like a sting operation, trying to elude local news channels and move our equipment onto the property and get out quickly without causing too much of a ruckus. It's definitely a project that will not be forgotten, especially by the technicians, who are no longer with us.

My favorite piece of equipment:

I think everyone would agree our favorite piece of equipment is our mini-excavators. We have four (three Bobcat, one John Deere) ranging in size from a small 4,000-pound-class machine used primarily for exposing lids and small repairs, to our larger 19,000-pound-class machine used for deep city sewer installs and large chambered systems. Everyone can run them proficiently, they are compact enough to get in tight places, easy to mobilize, and still have the power of a rubber-tired backhoe to get the job done. Sometimes we'll even double up on a project with two excavators to speed up the installation process.

Most challenging site I've worked on:

Our common niche is typically residential onsite; however, we ventured out and were awarded a replacement system for a large 120-year-old Catholic church campus. It was probably one of the most challenging installations we've ever completed, taking into consideration the coordination of all phases of the project, the time of year, and not being able to take the church out of service during construction.

Highlights of the project included directional boring of new mainline sewer to proper grade, demolition of existing tanks, and installation of two new large-capacity treatment tanks — one 2,000-gallon three-compartment and one 3,250-gallon three-compartment — while coping with groundwater and dewatering open holes for several days. We imported more than 3,000 cubic yards of filter sand and backfill material, installed 650 Infiltrator chambers in four separate beds as well as an irrigation ditch crossing involving pipe encasement.

This happened over six weeks during Colorado's notorious hard freeze in January/February and required many hours of planning and coordination. Frost protection, gluing pipe, dewatering and trying to expose existing utilities in a foot or two of frozen ground are hard items to cover in a bid. The project turned out a success and met required deadlines. Taking the church off a state-permitted system and getting approval through the county level saved over $100,000 in capital cost and around $20,000 per year in O & M cost the church was incurring.

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

On several occasions we have been asked by homeowners if we can locate and retrieve diamond rings, earrings and other valuables from their septic tank. Our vacuum truck is like most of those out there, and we have not found a unique or feasible way to accomplish "finding a needle in the haystack."

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

My belief in keeping our business successful boils down to ethics, making the right decisions and always doing the right thing no matter how difficult it is or how bad it may hurt. Like I explain to new hires with our team: "It's taken a long time and a lot of hard work to earn a good reputation; it only takes one mishap or oversight to ruin that reputation in a matter of minutes." Like I was taught at a very young age by my father, I believe strongly in standing behind my word and following through with promises I've made. If customers know you are honest and can own up to a mistake, they will no doubt be calling you back for their next project. Additionally, keeping a clean image certainly helps internally, as well as to our customers. Our technicians know they are held to a certain standard in keeping trucks and equipment clean, wearing uniforms and always performing on a professional level. This keeps morale high internally and reflects the professional image we want to portray to our customers.

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

Probably be ranching or involved in the agriculture industry in some shape or form. I really enjoy working with my hands, the outdoors and the feeling of accomplishment after a hard day's work. Oftentimes when I find myself knee deep in you know what — the Toby Keith song "Should've Been A Cowboy" starts playing in my head!

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

I strongly believe it's going to be very important for everyone in our industry to keep up with technology and be willing to look and work "outside the box." With all the growth we have seen in our region, we are finding more and more sites that are difficult to build on, and even more challenging to construct an onsite wastewater system on. I see challenges in our future with limited space in expanding existing systems and constructing new systems. The overall footprint of future systems will need to be smaller, and therefore filtering and advanced treatment will be key in my opinion. Designers will need to take more time to design systems that will fit the topography of the site, same as what an architect does with designing a custom home.

I also believe that O & M should be enforced harder by the regulatory agencies, with more stringent guidelines. If a property owner is not required to maintain their system, they more than likely won't until there is a problem. By that time, it's too late. Like I explain to many of our customers, pumping your septic tank is no different than changing the oil and filter on your car engine. If you neglect it for too long, you'll be faced with a rebuild and it won't be cheap. This goes hand in hand with educating the owners of onsite wastewater systems, possibly creating mandatory maintenance on their systems. If they miss a tank cleaning, maybe the "septic police" would place a padlock on a valve to prevent them from using the system until they get it serviced, similar to what happens when you don't pay your gas or electric bill.

HAVE A STORY IDEA?
Email us at editor@onsiteinstaller.com

Septic Tanks and Components

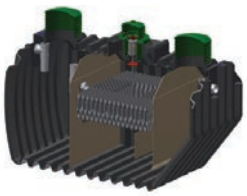
By Craig Mandli

SEPTIC TANKS

Coon Manufacturing rotationally molded polyethylene septic tank

Rotationally molded polyethylene septic tanks from **Coon Manufacturing** have a 1/2-inch wall thickness with a rectangular design that has vertical ribs every 3 inches for added strength. They are available in 500-, 1,000- and 1,500-gallon sizes. The 1,000- and 1,500-gallon units can be a single- or double-compartment tank. When installed properly and kept away from areas with motorized traffic, they can provide years of service. Tanks are sold with tees, grommets and lids included, and predrilled inlet and outlet holes for use with Schedule 40 pipe can be provided free of charge. Risers are also available. **660/485-6299; www.coonmfginc.com.**

Jet Inc. PLT Series



The 500 and 800 gpd **PLT Series** tanks from **Jet Inc.** are the lightweight, rotational-molded alternative to the concrete J-1500 Series. BAT Media Plants offer variable capacity in an NSF 40- and 245-listed treatment system. The seamless polyethylene tanks are designed for easy transport and installation in difficult site conditions. **800/321-6960; www.jetincorp.com.**

Norwesco low-profile septic tank

Low-profile septic tanks from **Norwesco** have molded-in support columns in the middle of the tank that are filled with flowable soil before backfilling to maximize strength, stabilize the tank during backfill, and reduce buoyancy. Molded-in tie-down and lifting lugs on the corners are designed for easy handling and moving. The inlet and outlet holes are predrilled. Gaskets and field-adjustable sanitary tees that can accept SDR 35 or Schedule 40 pipe are included. The one-piece tanks don't require certified assemblers. Dual-wall pipe, PVC ribbed pipe or Norwesco's safety lid/riser combination can be used for a riser. **800/328-3420; www.norwesco.com.**

LIDS

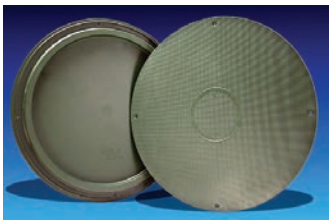
Fergus Power Products Duel Power Lid

Duel Power Lids for septic tank installations or restorations from **Fergus Power Products** are designed for new installation or to complete a restoration project by replacing a concrete lid. It is designed like the rafters in a house to give structure durability to support heavy wheel load without added weight to the lid. The top is slightly domed to meet compliance throughout the U.S. Lids can be insulated with R-value of six and are available in 18-, 24-, 30- and 36-inch sizes. **218/736-6772; ferguspowerproducts.com.**

Hedstrom Environmental Septic Line

The **Hedstrom Envrionmental Septic Line** is designed to eliminate riser systems. Poly 18- and 24-inch lids and adapter plates are retrofit for standard corrugated I.D. drainpipe. The square-to-round adapter plate allows for quick conversions of tank risers to corrugated pipe. Products are rotationally molded for strength with UV inhibitors to protect against color fade. Lids can be standard, ordered foam-filled or can be filled with sand for additional strength. Gasket and safety screws come standard, along with optional custom nameplates displaying company name and number. Safety nets are available upon request. **855/556-6755; www.hedstromenvironmental.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. The lid has a flat-style flange, allowing flush-to-grade installation; a cored centering ring, providing an easily aligned snug fit; and a urethane gasket to help provide 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. Lids have

a nonskid surface with customizable center insert (for logos, etc.), along with a molded-in "caution" statement. In addition to the standard green color, they're available in three landscape patterns — grass, river rock and bark. 800/348-9843; **www.orenco.com**.

RISERS

Infiltrator Water Technologies EZ Snap Riser

The **EZ Snap Riser** from **Infiltrator Water Technologies** is an easy-to-assemble watertight riser system for septic tanks, pump tanks and cisterns. The modular sections and click-and-lock technology allow the riser height to be customized for any installation and create a watertight gasket-to-gasket seal. Made from polypropylene, the risers can be used with either concrete or plastic tanks and are available in 2-, 6- and 12-inch sections with a 24-inch diameter that can be nested for efficient transportation. No assembly tools, sealant/caulk or hardware is required. The slip-resistant lids are fastened using stainless steel screws and can withstand a wheel load comparable to the weight of a full-size pickup truck. The system includes a safety lid providing secondary protection if a primary riser lid is damaged or removed. 800/221-4436; **www.infiltratorwater.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 all necessary mounting hardware, including safety screws. 800/382-7009; **www.tuf-tite.com**.

SEPTIC FILTERS

Anua Airashell

Airashell from **Anua** is a modular biofilter with a small footprint. The air treatment system removes a wide variety of noxious odor compounds, including more than 99 percent hydrogen sulfide, and can handle high variability in compound concentrations, according to the maker. It is prepackaged with recycled seashells, which protects the environment while reducing solid waste. The seashell media acts as a host for biological activity and a catalyst for pH neutralization. Chemicals are not required, operation is easy and life cycle costs are low. Applications include manholes, lift stations, wastewater treatment plants, sludge processing facilities, manufacturing facilities and solid waste or composting operations. 336/547-9338; **anuainternational.com**.

Bio-Microbics SaniTEE

SaniTEE effluent screening devices from **Bio-Microbics** protect absorption areas from premature clogging and failure due to the release of nonsettleable solids and/or nondegradable flushed materials from the septic tank. Available in 4-, 8- and 16-inch-diameter sizes, the unit installs directly in the outlet tee of the tank. Its keyhole weirs provide consistency of flow despite surges. The angled slots resist blinding and prevent clogs inside the filter housing to extend the life of the system, reduce clogging material, and improve flow conditions. It has easy slip-in installation and comes standard with swabbing feature for clean-in-place maintenance. 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 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 any solids from sloughing off and traveling to the dispersal area. After the primary cartridge is cleaned, the secondary screen can be removed and cleaned without the threat of solids settling into a leachfield. It can handle up to 4,000 gpd and can be assembled on site in a multi-filter configuration for larger flows. 800/928-7867; **www.clarusenvironmental.com**.

Polylok PL-250

The **PL-250** effluent filter from **Polylok** is designed to handle up to 3,000 gpd with 250 linear feet of filtration. According to the maker, PL-250 and its other filters are easy to install, and designed with functionality and longevity in mind. 877/765-9565; **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 result in increased longevity. All filter types start at over 2,000 square inches of filtration area. The 45 percent 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**.

CASE STUDY

One-piece concrete tank a solution to challenging septic area

Problem: Southern Kent Island in Queen Anne's County, Maryland, is widely known by area residents as a challenging location for septic solutions thanks to a high water table and highly permeable soil. The $34 million SKI project will require more than 700 on-site tanks over the course of four years. When Nancy Mayer, president of Mayer Brothers, heard about the project, she was intrigued, but also hesitant due to the challenging site conditions and several tests that included water above the top of the tank.

Solution: Mayer had helped fellow National Precast Concrete Association member Jarrett Concrete in Nashville, Tennessee, apply for a patent and trademark for a new type of watertight precast concrete tank. The **Top Tight** system is a one-piece tank, and proved to be the perfect fit for the SKI project, giving Mayer confidence to bid the job. New forms were ordered and Mayer Brothers started pouring the first tanks in late February.

Result: The county has been pleased with the tanks that have been delivered to date and the company is steadily increasing production as the project progresses. All tanks will be delivered in less than three years. 800/366-7731; www.precast.org.

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Arkansas Onsite Wastewater Association; www.arkowa.com

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GEORGIA

Georgia Onsite Wastewater Association; www.onsitewastewater.org; 678/646-0379

Georgia F.O.G. Alliance; www.georgiafog.com

IDAHO

Onsite Wastewater Association of Idaho; www.owaidaho.org; 208/664-2133

ILLINOIS

Onsite Wastewater Professionals of Illinois; www.owpi.org

INDIANA

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

IOWA

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

KANSAS

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

KENTUCKY

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

MAINE

Maine Association of Site Evaluators; www.mainese.com

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

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

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Massachusetts Association of Onsite Wastewater Professionals; www.maowp.org; 781/939-5710

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Michigan Onsite Wastewater Recycling Association; www.mowra.org

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

MINNESOTA

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

MISSOURI

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

NEBRASKA

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

NEW HAMPSHIRE

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

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

NEW MEXICO

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

NEW YORK

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

NORTH CAROLINA

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

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

North Carolina Pumper Group; www.ncpumpergroup.org; 252/249-1097

OHIO

Ohio Onsite Wastewater Association; www.ohioonsite.org; 866/843-4429

OREGON

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

PENNSYLVANIA

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

Pennsylvania Onsite Wastewater Recycling Association;
www.powra.org

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

TENNESSEE

Tennessee Onsite Wastewater Association;
www.tnonsite.org

TEXAS

Texas On-Site Wastewater Association;
www.txowa.org; 888/398-7188

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

VIRGINIA

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

WASHINGTON

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

WISCONSIN

Wisconsin Onsite Water Recycling Association;
www.wowra.com; 608/441-1436

Wisconsin Liquid Waste Carriers Association;
www.wlwca.com; 608/441-1436

NATIONAL

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

National Onsite Wastewater Recycling Association;
www.nowra.org; 800/966-2942

National Association of Wastewater Technicians;
www.nawt.org; 800/236-6298

CANADA

ALBERTA

Alberta Onsite Wastewater Management Association;
www.aowma.com; 877/489-7471

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Onsite Wastewater Systems Installers of Manitoba, Inc.;
www.owsim.com; 204/771-0455

NEW BRUNSWICK

New Brunswick Association of Onsite Wastewater Professionals;
www.nbaowp.ca; 506/455-5477

NOVA SCOTIA

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

ONTARIO

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

Ontario Association of Sewage Industry Services;
www.oasisontario.on.ca;
877/202-0082

SASKATCHEWAN

Saskatchewan Onsite Wastewater Management Association;
www.sowma.ca; 877/489-7471

CANADIAN REGIONAL

Western Canada Onsite Wastewater Management Association;
www.wcowma.com;
877/489-7471

INDUSTRY NEWS

Felling Trailers partners with SmartEquip

Felling Trailers announced a partnership with SmartEquip Network to provide dealers and fleet owners real-time access to parts and service information. Felling plans to expand offerings for the common replacement parts on their larger-model trailer lines.

John Deere, LHP Telematics announce collaboration

John Deere and LHP Telematics are joining to further advance the proficiencies of John Deere WorkSight and JDLink data so customers can access data from all machines in a fleet from one location. John Deere customers will have direct access to meter readings, locations, fault codes, utilization hours and fuel consumption, regardless of the manufacturer.

Komatsu wins 2017 EquipmentWatch award

Komatsu America announced it was named a 2017 winner in EquipmentWatch's annual Highest Retained Value awards program. The WA320 wheel loader, GD655 motor grader and BX50 forklift lines were the recognized model series for the awards.

PRODUCT NEWS

Felling revamps Pan Series trailers

The Pan Series from Felling Trailers has a low load angle and a ramp width from 14 to 16 inches. Standard dual taillights and EZ Lube Hubs are also offered. **866/213-2949; www.felling.com.**

Water Cannon Universal Fit surface cleaner

The Universal Fit flat surface cleaner from Water Cannon has a 15-inch diameter that cuts cleaning time on big jobs. It is made of quality steel and uses two high-pressure rotating jets for fast and streak-free cleaning. The cleaner works with most gas pressure washers with quick-connect spray wands and is compatible with either hot- or cold-water pressure washers up to 4,200 psi. **800/333-9274; www.watercannon.com.**

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