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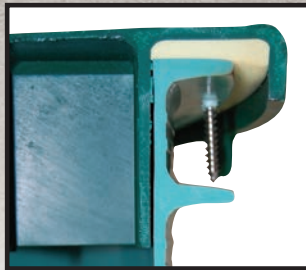
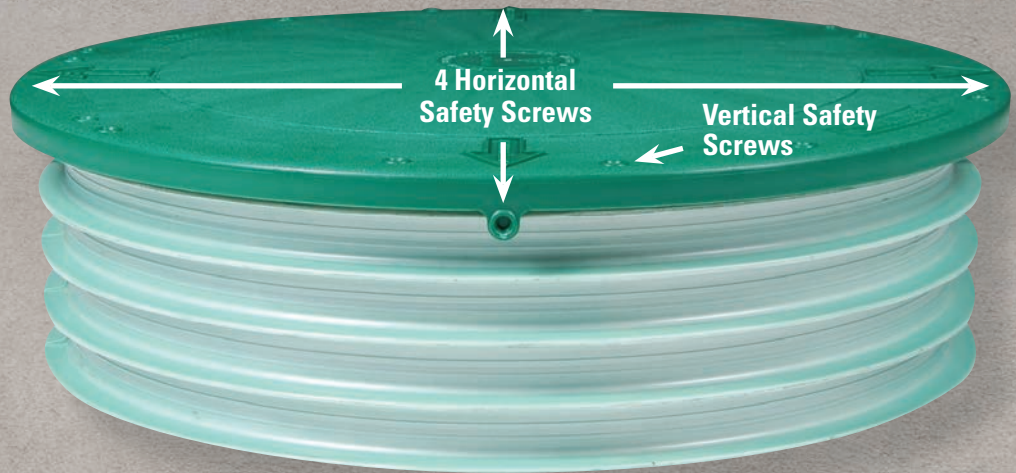
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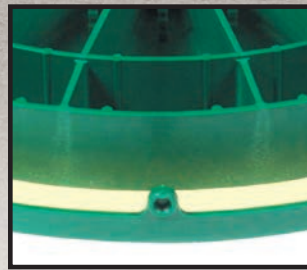
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INSTALLER PROFILE:

His Own Boss

By David Steinkraus

ON THE COVER:

An Indiana couple fulfilled a business dream when they took over Dutcher Trenching. Co-owner Josh McCloud is shown in the field with his Kubota KX057-4 excavator. (Photo by Marc Lebryk)

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Enjoy this issue!

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

Jim Kneiszel



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

You Can't Install Our System Until *When?*

Follow these tips when you're embarrassed to tell customers how long they'll have to wait for you to show up with an excavator

Earlier this year, I was catching up with an installer and talking about business prospects as winter gave way to spring. He reported that new customer calls were coming in daily and he was already booking dates into mid-2022. We reminisced about a time not that long ago when contractors waited by the phone for a new project to come along. We both marveled at the economic turnaround.

It's often said that a good problem to have is too many customers. This is especially true for the small businesses that make up the installer community. A backlog of work ensures confidence in meeting future payroll, that you might be able to buy a new piece of equipment or meet the ambitious goals in your business plan.

As you get busier, start to specialize and accept work you can do faster based on your group's skills. **Consider partnering with another installer with different skills and interests and trade work back and forth.**

It's a strange question to be asking, but what happens when you have too much workload? When does it become uncomfortable to tell a homeowner that you can't get around to a septic system replacement or a new-home onsite system for another year or more? It's great when your services are in high demand, but too much work on the job board could also have a detrimental impact on your small business.

I get the dilemma. You don't want to turn down any work coming your way. Yet you don't want to disappoint your customers with delays, you don't want to overburden your employees and you may not want to add a crew and then risk having to lay off workers if the current hot economy cools down.

Is your calendar is filling up past a month of Sundays? Here are a few suggestions to cope with the bottleneck and satisfy more customers:

Can you put another crew in play?

This is often the first question contractors ask when the economic rollercoaster climbs to the highest peak. Do your market research to determine if upcoming contracts will sustain a new crew for the long haul. Is your region growing rapidly and is new housing expected for years to come? Is the existing housing stock getting older, indicating a raft of system replacements is on the horizon? Are there more competitors today, or are installers retiring and opening up new opportunities? With enough study, it should become clear whether or not training new workers is a worthwhile endeavor.

Delay your way out of trouble

When customers call, quickly prioritize how soon they will need their project completed. For those wanting replacement systems, suggest helping extend the life of their systems through proper maintenance. This will accomplish something for both sides. The customer will be able to better prepare financially for the project, and you will be able to serve customers with more imminent needs first. Careful juggling and slotting of jobs will allow you to retain more customers and eliminate wasted days or hours as your schedule fills up.

Be choosier about the projects you take on

Narrow the focus of your work to improve efficiency and be more organized about the customers you have to turn away. Let's assume your team is particularly skilled or enjoys installing either conventional or alternative systems, or working in new construction subdivisions versus waterfront sites, for example. As you get busier, start to specialize and accept work you can do faster based on your group's skills. Consider partnering with another installer with different skills and interests and trade work back and forth.

Price for profitability

A hot economy might not be the only reason your phone is ringing off the hook. Could it be that you get so many calls because you're the cheapest installer in the area? A busy schedule presents an opportunity to evaluate your pricing and make sure your profits match your expectations. One of the biggest mistakes a small business can make is not knowing the

profitability of every job. If you and your employees are not being compensated adequately, a period of high demand might allow you to rectify that.

Create a smart pecking order

The client list for installers can easily be separated into groups of likely one-time customers and potential repeat customers. You will probably only install one septic system for a homeowner customer — unless they move from house to house frequently. But a residential homebuilder, a subdivision developer or a system designer is likely to reach out to you more regularly. At times of high demand, take on the work of potential repeat customers first, as they may still be hiring you when the construction industry cools down again. You want to keep them happy.

Do what you do best. Hire for the rest.

Recently we profiled an installer who didn't want the challenges that come with hiring more employees, so instead he started subcontracting work to other excavating contractors. That strategy might make sense to ease the workload at particularly busy stretches for your company. Concentrate your labor on tasks you do particularly well or have the right equipment for. Hire other contracting companies to complete the tasks they are either more skilled at or have the right equipment for. For example, you might subcontract the site prep and finish work but bring in your crew to place the tanks, pumps, control panels and drainfields.

Under-promise and over-deliver

When you're wrestling with the calendar, give your customers the worst-case scenario for completing the job. You might think you can get to the project in October but schedule it for December. This allows you to beat the expectations on one hand, or to move up a more time-sensitive project on the other. Pushing the schedule also helps you better deal with unanticipated delays due to bad weather or government approvals. The longer the deadline, the more flexibility you will have to tweak the schedule.

WORDS OF WARNING

When the workload piles up, whatever you do, take care of your staff. Human capital is your greatest asset. Well trained and reliable installers are worth their weight in gold. You are better off turning down work than risking overburdening your crew and having valued employees leave. It probably costs more to find, train and retain a quality installer than you paid for your last piece of excavation equipment. So you want to keep the

lines of communication open and watch for signs they are burning out on the job.

Also, be diligent not to cut corners as you try to keep pace with a crowded calendar. Aside from your workforce, you rely most on your company's hard-earned reputation for quality work. It's just not worth chasing more invoices if you can't maintain the level of service your customers have come to expect. □

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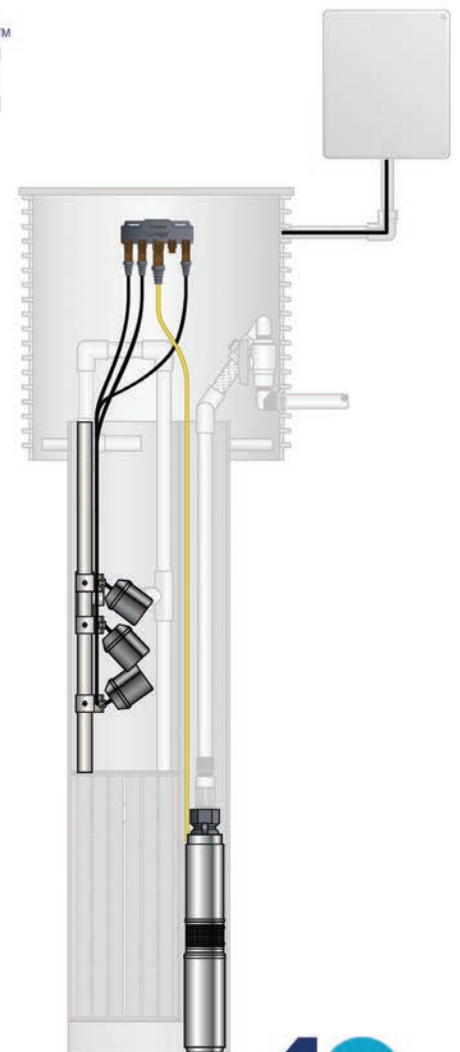
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PIPE MATERIALS
Joining PVC Pipe Without Glue

Using primer and glue is the most common method to join together two pieces of PVC pipe, but there are other connections and joints used and needed for specific applications. This exclusive online article breaks down other options and tips for joining pipe to ensure a watertight connection.

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Overheard Online

“Explaining what you are doing and why will give a customer much more confidence. But you have to simplify your solution, which means going through a lot of what you think of as ‘common knowledge’ that maybe isn’t so common.”

— *The Downside to Being an ‘Onsite Expert’*

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LANDSCAPING AND CARE OF AN STA
Keep Soil Treatment Areas in Tip-Top Shape

Establishing proper vegetative cover and limiting traffic over a soil treatment area is an important part of septic system functioning. And what property owners do around their tanks and pretreatment units and over the STA can greatly impact the accessibility and longevity of the system. This two-part series explains how proper landscaping will minimize negative impacts and promote positive outcomes, and how to instruct homeowners to care for their system and STA. onsiteinstaller.com/featured



KEEP YOUR FLEET RUNNING
Preventive Maintenance Tips

Any mechanic will tell you that preventive maintenance will save you time and money. Even so, many contractors still come up short when it comes to fleet maintenance. In this article, a mobile mechanic shares a few tips for making sure fleet maintenance is done regularly and in an effective manner. onsiteinstaller.com/featured

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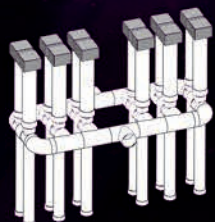
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INSTALLER PROFILE



HIS OWN BOSS

After 30-plus years working on installing crews for others, Josh McCloud has staked his claim at Indiana's Dutcher Trenching

By David Steinkraus

◀ John and Brittany McCloud are shown at the Dutcher Trenching shop in Crawfordsville, Indiana, with drainfield products from Infiltrator Water Technologies. (Photos by Marc Lebryk)

▶▶ Josh McCloud is behind the controls of a Kubota KX057-4 excavator with a ripper tool he made to help remove tree stumps for a raised bed system installation.

Buying Dutcher Trenching Inc. about four years ago was the fulfillment of a dream for Josh and Brittany McCloud. And it was their second dream fulfilled.

“Josh has been putting systems in since he was 16,” Brittany says.

“Thirty-one years,” Josh adds.

Josh says he has always wanted to run his own business. He grew up 10 miles north of Crawfordsville, Indiana, where their company is based. He has installed for other companies in every place they’ve lived, including six years in Minnesota while they chased their first dream. That was Brittany’s dream.

She is now retired from her own baking business. She started it just after their sons were born so she could work at home with them. As an older student, she attended Le Cordon Bleu in Minneapolis and opened her own shop in Darlington, Indiana, about 7 miles from Crawfordsville.

“And I got osteoarthritis really bad. I needed to change what I was doing, so I had to retire from my baking,” she says. The arthritis was apparently from farm work and playing softball.

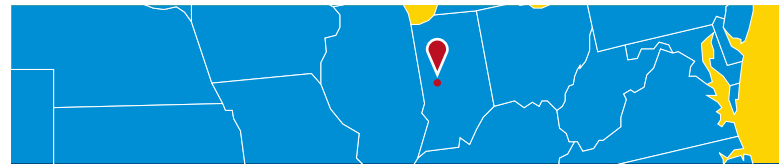
“I can still do things. I just have to know my limits now,” she says. “Josh helped me with my goals and dreams, so now it’s me helping Josh with his goals and dreams of owning his business.”

WE'RE A TEAM

Whenever the installation crew needs help, Brittany will jump on equipment or climb down in a ditch. “I grew up on a farm, so I’ve been running

equipment and driving tractors since I was 9,” she says. The rest of the time she’s in the office minding the schedule, marketing, taxes, phones and payroll.

She also handles a good deal of customer education. “When people have problems with septic systems, they call in a panic. So I just try to give them a confident and compassionate voice. I can calm them down and tell them we will come and help them figure out the problem,” she says.



Dutcher Trenching Inc.

Crawfordsville, Indiana

- Owners:** Josh and Brittany McCloud
- Founded:** 1959
- Employees:** 5
- Service area:** 50-mile radius
- Services:** Installations, repairs, pumping, drain-cleaning, jetting
- Affiliations:** Indiana Onsite Wastewater Professionals Association, National Onsite Wastewater Recycling Association



“We’ve had so many customers that we’ve done new systems for — and it breaks my heart — because the home inspector didn’t do their job.”

Brittany McCloud

Even though she isn’t working in agriculture, Brittany says, her Purdue University degree in animal agribusiness has helped her throughout her adult life. For both Josh and Brittany, education is not something they did only when they were young. They are still learning. It’s how they keep their business edge. They attend Indiana Onsite Wastewater Professionals conferences, meetings of the National Onsite Wastewater Recycling Association, and the annual WWETT Show in Indianapolis.

“Any time we have a chance to educate ourselves to help our customers, and for our business to grow and do better, we take it. Plus, we like learning things,” she says.

GROWING BACK

The McClouds took over a diminishing business. The previous owner, son of the company’s founder, was transitioning to retirement and had been cutting back on work. Now the McClouds are growing the company, yet they don’t have a website and haven’t done much marketing with

Facebook, Instagram and other social media.

Because the company was so well known, Brittany says, they were concerned about what would happen if they advertised too soon after taking ownership. They didn’t want to attract so much business that they would have to put customers off or overwork their team.

Now that they have a handle on the business and growth is more controlled, Brittany launched a Facebook presence and is working on a website. She has one app in particular that works well. It’s Nextdoor, a social networking service that allows users to trade information within a neighborhood or a similarly limited area.

Dutcher customers first created a page about the business, Brittany says, and she claimed the page and edited the information so it was correct. Once in a while she’ll add a post, publish a photo of a crew working or provide advice on how to care for a septic system.

Brittany estimates they have about 15% of the market in Montgomery County, where Crawfordsville is located. Once they have an established customer, she’ll send postcard reminders about having a tank pumped. Simple actions like that help people become loyal customers, she says.

They’ve also found that few new-subdivision homeowners are educated about onsite technology, Brittany says. They typically don’t understand that tanks need to be pumped and filters must be cleaned. So a little customer education can turn people into Dutcher customers, she maintains.

FULL SERVICE MENU

Dutcher has three main business divisions: installations and repairs of sewer and onsite systems, cleaning, and pumping, Josh says. Installations and repairs are about 35% of revenue, cleaning is about 30%, and pumping is another 35%.

continued >>



◀◀ Jake McCormick prepares a Spectra Precision laser level to check the grade at the beginning of an installation project.

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◀ Jesse Gish, left, and Jake McCormick deliver a Kubota KX model excavator using a 24-foot CornPro trailer. They are about to start a new installation.

“Josh helped me with my goals and dreams, so now it’s me helping Josh with his goals and dreams of owning his business.”

Brittany McCloud

QUALIFIED HOME INSPECTORS NEEDED

Crawfordsville, Indiana, is about 50 miles from downtown Indianapolis, and people are moving out from the city as they do in many parts of the country. But many new to country living don’t understand they need specialists to evaluate onsite systems, says Brittany McCloud, who owns Crawfordsville-based Dutcher Trenching Inc. with her husband Josh.

The housing market in their area is very busy, she says, and that may be discouraging people from waiting to hire an inspector certified through the Indiana Onsite Wastewater Professionals Association. Instead, homebuyers are depending on general home inspectors to also evaluate onsite systems.

“We’ve had so many customers that we’ve done new systems for — and it breaks my heart — because the home inspector didn’t do their job,” she says.

She said she and Josh have talked about joining other companies to push for a state rule requiring onsite inspections by certified professionals. This is not to dismiss the job of home inspectors, she says, but they seem to focus on what they know best, whether it’s plumbing or electrical systems. Yet if they don’t understand onsite technology, there should be a change in regulations in order to prevent problems and unpleasant surprises for home buyers, she says.

A jetter came with the company, so it was easy to justify offering that service, Brittany says. Also, she says, because Dutcher does both installation and pumping, they understand how different parts of the business can work together.

For example, Josh says, he’s advised homeowners to put a well at the rear of a property because it seldom needs attention, but to locate the septic tank near a driveway or road when possible so it can be easily serviced. Installers who don’t pump may not think of that, he says. “They’ll put tanks in places you can’t reach with a hundred feet of hose from the driveway.”

Installations consist of about 90% replacements for older failing systems or upgrades. Montgomery County has many existing homes and little new construction, Brittany says. Most of their pumping is done in the county, but technicians drive farther for install work. They also pump in neighboring Fountain County because many pumpers there have closed shop over the last decade.

Even though their county makes up one edge of the Indianapolis metropolitan area, the McClouds are not trying to find new install customers in the growing areas around Indiana’s population center. “We had all we could get done [in 2020]. We were just finishing up at the end of December and first of January,” Josh says.

“Which is unusual,” Brittany adds. “We were blessed with good weather.”

SAND SOLUTIONS

Most of the systems they put in use sand beds for final treatment. It’s a technology Josh hadn’t installed until he took over Dutcher, but he’s come to appreciate the solution.

“Yards sometimes aren’t big enough for a conventional system,” he says. That’s true 90% of the time in their area, and in parts of the county the soils are also not good, he adds.



▲ Josh McCloud prepares to open a manway on his Freightliner vacuum truck built out by Wee Engineer and running a National Vacuum Equipment pump.

Most customers like a sand bed because it doesn't need a vent. That means there is no pipe sticking out of the ground and limiting use of the space such as at a golf course, Brittany says.

The company installs frequently for the Indiana Department of Transportation. A recent job at a state highway garage in Rockville, Indiana, required a 386-foot run of pipe. "We had to pump wastewater basically from one end of their yard clear to the other because that's the only place they had left that was virgin dirt for the septic," Josh says. A high water table complicated the job as well.

The state has been a good partner for Dutcher, Brittany says. There's more paperwork involved in government contracting, but a good relationship brings in regular business, she says. "We bid the jobs, but they know our work well enough now to know that they want to use us," she says. "They also like to use local vendors."

This relationship began with a clogged sewer at the department's maintenance garage in Crawfordsville. "We went out there with the roter, and they had two or three other companies that said they couldn't clear it, and I just did a little more digging than everybody else and found a cleanout," Josh says.

Indiana law allows Josh to design systems, too. He says he prefers to design onsite, laying out a system to fit what he sees and making the drawings later. For commercial systems, he prepares drawings in advance as the state requires.

They have good relationships with their consulting soil scientist and the local health department, Brittany says. It's common for all parties to show up for soil borings, Josh says, and by the third bore everyone generally agrees on how a system needs to be positioned.

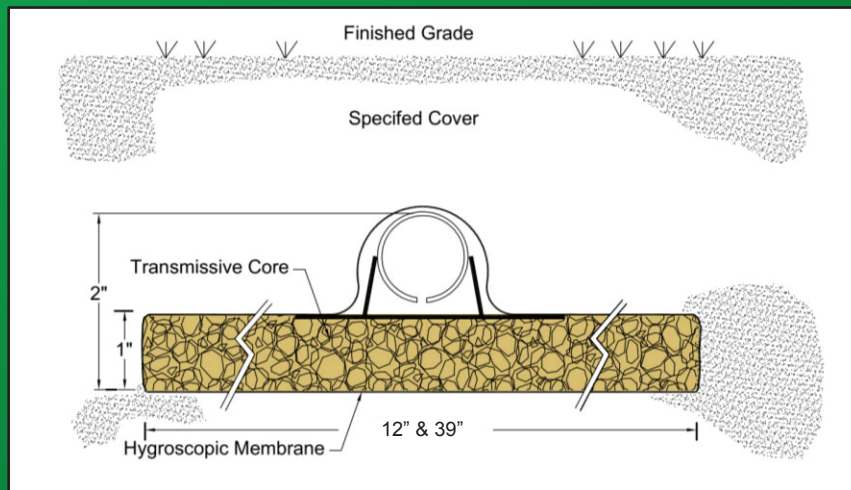
continued >>

"We went out there with the roter, and they had two or three other companies that said they couldn't clear it, and I just did a little more digging than everybody else and found a cleanout."

Josh McCloud

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◀◀ The Dutcher Trenching team includes, from left, Jake McCormick, Jesse Gish, Josh McCloud, Brittany McCloud and Emmett McCloud. They are shown with a 2001 Freightliner from Wee Engineer and carrying a National Vacuum Equipment pump.

The Dutcher Trenching team that utilizes all this equipment includes — in addition to Josh and Brittany — their oldest son Emmett McCloud, 21, Jake McCormick and Jesse Gish. Their younger son Dawson, 19, is in college and works with the company when classes aren't in session.

SEPTAGE WOES

Septage disposal is a challenge for their pumping operation. The local wastewater plant won't take it because of capacity limits. For the team at Dutcher Trenching, the solution for the moment is a pair of 6,000-gallon tanker trailers. One is insulated. The other is uninsulated.

Septage is unloaded from the vacuum truck into the tankers, and those are hauled to the wastewater treatment plant in Indianapolis. In the cold off-season, there's one trip a week, and the insulated tank keeps the septage liquid. In the heat of summer, both tankers are in use, and there are at least two trips per week. It's a 104-mile round trip.

When they first took over the business, it was a shock to learn the local plant was unable to accept rural wastewater, Josh says. But after they attended National Onsite Wastewater Recycling Association workshops on plant operations, they understood the reason. Now their goal is to solve the problem themselves. In five years, they hope to have their own wastewater treatment plant up and running.

MACHINE MATTERS

A diverse company needs a diverse selection of equipment to get the job done. These are what the Dutcher team depends on:

- A 2001 Freightliner vacuum truck with a Wee Engineer 3,500-gallon steel tank and NVE 367 pump (National Vacuum Equipment).
- A 1998 Freightliner semi-tractor to haul septage in two 6,000-gallon trailers with Brenner steel tanks (Wabash National).
- A 2012 CornPro trailer, 24 feet with a tilt top, to move a 2012 Kubota KX057-4 mini-excavator.
- A 1999 New Holland 665 skid-steer on a Cronkhite tilt-top trailer.
- A 2006 1-ton GMC 3500 to pull the excavator trailer.
- A 2004 Ford F-250 to pull the skid-steer trailer.
- A 2001 Ford E-150 van for service work.
- A 1984 Sewer Equipment Co. of America trailer jetter with 600-gallon tank, a 4,000 psi pump and 300 feet of 3/4-inch hose.

General Pipe Cleaners' Gen-Eye locator is fantastic, Josh says. "I wish I would have had one of them three, four years ago when I started full time."

LOOKING DOWN THE ROAD

Brittany says they hope their older son will become the full-time vacuum truck operator because he works so well with customers. That would allow them to hire more installation crew members, and it would mean both types of work could occur simultaneously. As it is, Emmett is sometimes shifted from pumping to help with installations.

The McClouds are also looking farther ahead than the few years it will take to start running a treatment plant. Josh is 47, and Brittany is 45. In other words, they have a good 15 or 20 years before they will want to step out of the business.

"Right now, with our ages, we want to make sure we have an exit planned and retirement planned," Brittany says.

They have a good dream, but the dream won't last forever and will have to be passed to another generation. ◻

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Federal Infrastructure Bill Could Include Money to Replace More Septic Systems

By David Steinkraus

Part of the federal budget infrastructure request from President Joe Biden says money could be used for repairing up to 180,000 septic systems. That number was in the budget letter the Biden administration sent to Congress.

The Biden administration is asking for a total of \$3.6 billion for water infrastructure. It would be a \$625 million increase over the 2021 budget, according to the National Association of Counties. Yet the sum is not guaranteed.

The president's request is only the first step in assembling the next federal budget. Congressional committees will hold hearings and decide on how much money will be appropriated for the federal budget and how that money will be allocated.

Montana

In 2015, Montana adopted numeric standards for the amount of phosphorus and nitrogen pollution in its waters. Now it's reversing that policy. Under SB 358, signed into law recently by Republican Gov. Greg Gianforte, the state will transition to a "narrative standard" by March 2022. What that standard will look like is unclear, reports the *Montana Free Press*, a nonprofit news organization.

Sen. John Esp, R-Big Timber, said he sponsored the bill because the numeric standards were too stringent for people to meet. Public comments were 18 in support of the bill and 215 against.

Instead of using numbers to measure pollution, the bill mentions regulating discharges of phosphorus or nitrogen that create conditions toxic to human, animal, plant and aquatic life; create conditions that produce undesirable aquatic life; or cause measurable changes in aquatic life.

The Montana Department of Environmental Quality (DEQ) will talk to its nutrient working group, which includes people from industry and environmental organizations, to develop a new standard. A narrative standard does allow development of different standards for different waterways, the DEQ has said. But in a document that came out of the working group before the bill passed, the DEQ said applying a narrative standard depends on judgment, could be time-consuming, could result in controversy and may produce permit limits that are inconsistent from one project to another.

California

Sonoma County, just north of San Francisco, is about to begin a two-year study of onsite wastewater options for the communities of Monte Rio and Villa Grande along the lower Russian River. Money for the study was approved by the California State Water Resources Control Board. Both

communities are considered disadvantaged, said a press release, and onsite systems are failing. Steep terrain and high groundwater complicate wastewater disposal.

North Carolina

Genetic testing by the local conservation group MountainTrue shows that cattle are the largest source of *E. coli* pollution in the French Broad River that flows through Asheville. Humans were usually the second-largest contributor at the four locations sampled. This is significant because waterway contamination is often blamed on failing septic systems, the likeliest source of human DNA.

Money for taking samples and doing genetic analysis came from the state with the help of state Sen. Chuck Edwards, R-Raleigh, said the *Hendersonville Lightning*. "Testing DNA in polluted water is pretty state of the art, and it isn't cheap," said Hartwell Carson, French Broad Riverkeeper.

DNA from human *E. coli* was most prevalent in Mud Creek below downtown Hendersonville. The level was 120 DNA copies per 100 ml of sample. Cow *E. coli* DNA measured 251 copies at the same spot. At other locations, human *E. coli* DNA was between one-tenth and one-quarter as prevalent as that from cows.

New York

Two federal legislators from New York are trying to use a federal bill for infrastructure spending to remove a tax liability for people upgrading their onsite systems.

Last year, the Internal Revenue Service ruled that people in Suffolk County who used county grants to upgrade their onsite systems had to treat that money as income on their taxes, even if most of the money went directly to contractors. That ruling affected 293 grants worth a total of \$3 million.

"The federal government should be supporting, not punishing, efforts to improve wastewater infrastructure and water quality," Democratic Sen. Kirsten Gillibrand said in a press release. With Rep. Tom Suozzi, D-Glen Cove, she is pushing for the tax change.

If enacted, the change would cover all county residents who applied for grants after Dec. 31, 2018.

* * *

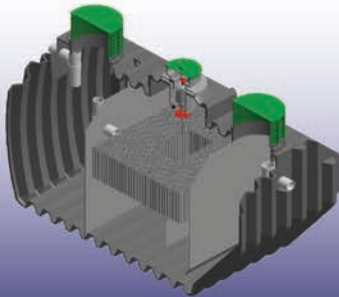
Suffolk County will use about \$100 million to repair or replace failing onsite systems and connect homes to sewers.

The pot of money includes federal, state and county funds. Of the total, \$30 million will be invested in the county program that provides \$10,000

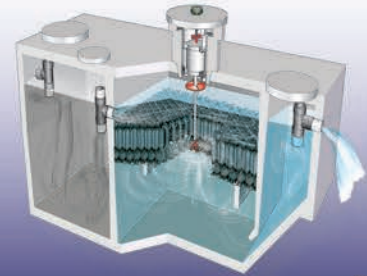


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grants to homeowners for repair or replacement of failing onsite systems, news reports said. The other \$70 million will be used on two sewer projects.

About 360,000 homes in the county, which covers the eastern part of Long Island, use cesspools for wastewater treatment. These have been shown to contribute to pollution of the Atlantic Ocean. For several years, the county and its municipalities have focused on this issue and passed laws to require nitrogen-reducing systems for new construction and home expansions. □

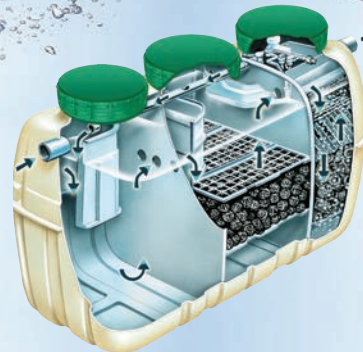
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Be a Flow Fighter and Preserve a Septic System

Help homeowners stop leaks and wasteful water habits so their systems will last longer and perform better

By Jim Anderson and Dave Gustafson

Homeowners and installers alike are always asking us what can be done to help onsite systems operate better and last longer? One of the best and worst things about working in this industry is that just about every site visited is different, so what is useful at one is not at the next. This is true even though our designs, sizing and configurations use or are based on certain averages in behavior and use. The more that is known about the individual system and specific use patterns by the homeowner, the better we can tailor our recommendations.

For the most positive impact on systems, you need to take a two-pronged approach. Total wastewater flow (volume) and the amount of pollutants (organic and inorganic) need to be managed and reduced. Let's take a brief look at how working with the homeowner can affect each of these in a positive direction.

Water use in the house takes place primarily through toilet flushing, bathing and clothes washing. We have discussed in the past how some of these use parameters are changing through time, but they are still areas to be addressed in the house to help systems work more efficiently and increase their lifespan.

A leaky toilet can easily deliver 3,000 to 6,000 gallons a month and a slightly leaky faucet 15 to 20 gallons a day or 450 to 600 gallons a month.

STOP OVERUSE

Toilet use still accounts for about 25% of the total daily flow; toilets, faucets and showers together represent about 70% of the flow. When working with a homeowner, emphasizing good habits and taking care of potential problems in these areas are good places to start reducing overall flows and have an immediate impact on the system.

Specific activities the homeowner can employ include using the toilet for sanitary waste and nothing else. It always amazes us what kinds of things people will try to flush down the toilet (kitty litter and animal waste, diapers, cigarettes). Recently disposable anti-bacterial wipes are big culprits. Using the toilet for only human wastes and toilet paper

reduces the amount of water and keeps out other items that do not break down or settle in the system.

Other water-saving habits can include simple items such as reducing time in the shower, turning off faucets while brushing teeth or shaving, operating dishwashers only when they are full (same for clothes washers, only run full loads) and making sure all faucets are turned off and not leaking.

A couple of comments about these: We have worked with homeowners who go so far as to implement a timer system for showers particularly where teenagers are involved. In those cases, large water-use reductions are accomplished. The volume of water used in a shower varies by individual, of course. But a standard showerhead delivers 3-5 gallons of water per minute, so a 10-minute shower would add 30 to 50 gallons of wastewater. Low-flow showerheads are probably an easier option than enforcing timed flows; they deliver 1.5-2.5 gallons per minute, providing more than a 50% reduction for the same time period. Of course, if they take a longer shower because they feel it is not doing the job, those savings are not obtained. The homeowner needs to find a balance, understanding that reducing any amount of water usage is positive.

DRIBBLES ADD UP

Leaks are always interesting to us. If you talk to any homeowner, they will tell you there are no leaks in the house. Then when you are out looking in the septic tank and all water is "shut off" in the house there is still water coming into the tank through the house sewer! Where is that water coming from? Usually, it is either a leaky toilet or faucet(s).

Leaks that appear very minor can deliver large amounts of water to the system. A leaky toilet can easily deliver 3,000 to 6,000 gallons a month and a slightly leaky faucet 15 to 20 gallons a day or 450 to 600 gallons a month. This is water that can be kept out of the system simply by taking care of leaks as they occur. It could make the difference between no system problems and having a hydraulic overload.

Installing additional low-flow devices to faucets and showerheads can save significant amounts of water. More efficient faucets and installing aerators can reduce water use from 3 to 5 gallons per minute to 2 gallons per minutes. The good news today is a lot of the faucets on the market already use these techniques to reduce flow, so the homeowner does not need to actively do anything other than repair leaks and limit running water.

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There is good news in the laundry and dishwasher front as well. Most modern dishwashers and washing machines are built to use lower amounts of water. It still a good idea to only use them with full loads, and in the case of the laundry, do not do all the laundry on the same day but spread it out over time.

In a future column, we will take up ways to reduce organic loading and other pollutants delivered to the system. □



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 BioMicrobics, Inc. 16002 W 110th St. Lenexa, KS 66219 913-422-0707 Fax: 913-422-0808 jcisneros@biomicrobics.com www.biomicrobics.com See ad page 8	BioBarrier, BioBarrier HSMBR Membrane Bio Reactors	250 to 30,000+	2009	Certified to NSF/ANSI 40 class 1, 245 (nitrogen reduction), 350 (water reuse) and EN12566-3 standards, the BioBarrier MBR system uses a complete, mixed activated sludge process with an optimized design of the "ULTRAFILTRATION" Membrane BioReactors to dramatically simplify the settling, screening, and direct aeration with BioRobic air grids to remove 99.9% of the contaminants. Installed in readily available water-tight tanks, the system meets water quality requirements for the reduction of chemical and microbiological contaminants for non-potable water reuse. Available for greywater-only and marine applications, the BioBarrier GWMBR and BioBarrier MarineMBR versions uses the same design as the land-based BioBarrier Systems.	Domestic and International
	SeptiTech STAAR	100 to 150,000+	1996	Designed for residential/commercial applications, the STAAR (Smart Trickling Anaerobic/Aerobic Circulation) Filter Systems' "Smart" technology allows automatic, reliable equalization and clarification processes; also maintains low levels of Nitrate-N. The STAAR achieves lower operating costs and power requirements with all below-grade components that fit readily in available concrete, plastic or fiberglass tanks. The STAAR Filter Commercial Systems utilize partially-submerged, secondary media to treat high organic loads. Suitable in areas where infrastructure is not available, SeptiTech STAAR systems rapidly reduce soluble BOD5 with efficient nitrification and denitrification for environmentally-sensitive areas and may qualify for equivalent secondary discharge standards.	
	FAST, FITT-ee	150 to 2 million	1996	Ideal for residential/commercial applications where infrastructure may or may not be available, RetroFAST, MicroFAST, HighStrengthFAST, MyFAST, MacroFITT, and MarineFAST are popular, advanced wastewater treatment systems with the SFR feature, a robust air delivery system and submerged fixed-film. The stability of the FAST treatment process manages effective sludge digestion for cost-effective treatment with less maintenance. The FAST technology provides alternate modes of operation, including intermittent to reduce electrical usage up to 45% and extra denitrification from the already ~70% nitrogen reduction (NSF 245). The effluent meets secondary quality requirements; can discharge to a drainfield or water reuse applications. [FITT-ee energy-efficient versions]	
 Delta Treatment Systems 9125 Comar Dr. Walker, LA 70785 800-219-9183 • 225-665-6162 info@deltatreatment.com www.deltatreatment.com See ad page 3	Wastewater DF	500 to 1,500	1993	The process occurs entirely within the self-contained treatment unit which is comprised of outer mixing tank and a cone-shaped settling chamber. Raw, unsettled domestic wastewater enters directly into the mixing tank where mixing occurs through an air distribution system. The mixed liquid then enters the settling chamber from the bottom. The settling chamber maintains a quiet condition which allows solids to settle down and re-enter the mixing chamber for more processing. The liquid from the ANSI/NSF 40 certified system is hydraulically displaced upward and is discharged as a clear, odorless treated water which meets or exceeds state water quality standards.	AL, AK, AZ, BC, BWI, CA, CO, FL, GA, HI, ID, IL, IN, IA, KY, LA, ME, MI, MD, MN, MO, MS, MT, NC, NM, NV, NY, OH, OK, ON, OR, TN, TX, UT, VA, WA, WI, WV
	ECOPOD	500 to 250,000	2006	The ECOPOD Advanced Wastewater Treatment System is a FFBR (fixed film bioreactor) system that houses an engineered PVC media specifically designed to treat domestic wastewater. Five models accommodate daily flows ranging from 500 to 1,500 gpd, with customizable options available for commercial applications up to 250,000 gpd. The ECOPOD is ideal for individual residential installations, cluster designs, and small-to-medium commercial wastewater treatment applications. Self-contained, it can be inserted into a standardized septic tank or vault providing quiet, odorless operation. ECOPOD is certified to ANSI/NSF International Standards 40 and 245, FHA and VA acceptable, and suitable for intermittent usage.	
	Enviro-Aire Package Plant	500 to 1,500	2005	The Enviro-Aire Package Plant consists of a three-step process to treat incoming wastewater. Raw wastewater enters the unit from a residence or facility. The first chamber is the primary chamber which separates the sludge (gross solids) and scum (floating solids) from the raw wastewater. Effluent then enters the aeration chamber where aerobic bacteria digest the organic waste. From the aeration chamber, the liquid enters the clarifier chamber, where additional water-solids separation occurs. Settled solids return to the aeration chamber for additional aerobic digestion. The air diffuser within the aeration chamber is a patented design to reduce back pressure on the air compressor and maintain constant, non-clogging air flow. The ANSI/NSF 40 certified system design is easy to operate and maintain and is engineered for low energy consumption.	IL, LA, MS, TX
 Eliminate, Inc. PO Box 359 Belgrade, MT 59714 888-406-2289 info@eliminate.com www.eliminate.com	Eliminate Grizzly	Up to 50,000	1997	The Eliminate Grizzly system is designed for large-scale, high-volume, high-strength commercial applications where advanced nitrogen reduction is necessary. The system was originally developed to serve high-altitude commercial and resort developments in the Rocky Mountains where winter temperatures linger at or below 0 degrees F, and seasonal use patterns/dramatic fluctuations in flow and wastewater strength are the norm. It functions with little operator input and simple maintenance. C-Series systems serve high-altitude highway rest areas, resort communities, golf courses, ski areas, mixed-use residential communities, restaurants, RV parks, work camps, corporate retreats, business parks and convenience stores. It is suited for use in multi-stage treatment trains and as a means of reducing waste strength prior to conveyance to municipal treatment facilities.	US

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTORS IN
 <p>Eljen Corporation 90 Meadow Rd. Windsor, CT 06095 800-444-1359 info@eljen.com www.eljen.com See ad page 17</p>	GSF	Scaleable	1982	The Eljen Geotextile Sand Filter (GSF) is an advanced wastewater treatment and dispersal technology. The GSF system provides treatment and dispersal in the same footprint while keeping installations easy and maintenance minimal for domestic and commercial applications. The system requires no startup period. GSF Modules are uniquely designed to provide vertical surface area and oxygen transfer to support the biological treatment of nutrients and contaminants, increasing the soil's ability to accept the effluent and the soil's long-term acceptance rate.	North America and Australia
 <p>Fuji Clean USA 41-2 Greenwood Rd. Brunswick, ME 04011 207-406-2927 Fax: 207-406-2929 info@fujicleanusa.com www.fujicleanusa.com See ad page 19</p>	CE Series	1,350	2006 Japan 2015 US	Fuji Clean's CE model series averages 50,000 systems being installed annually worldwide. The popularity is driven by a one-tank configuration, small footprint (7' x 4' for smallest model), low power draw (1.27kWh/day for most residential systems), easy plug & play installation, simple, efficient O&M and consistent treatment (90-95% BOD and TSS removal). No preceding septic tank necessary. NSF 40 certified. There are no moving in-tank parts. An external air blower (FujiMAC RII) introduces oxygen to aerobic chambers and powers two internal air lift pumps, which manage sludge return and discharge of clean effluent.	Most States
	CEN Series	1,350	2006 Japan 2015 US	Fuji Clean's CEN technology provides enhanced denitrification into its standard treatment process and produces a consistently high-quality effluent (NSF 40/245 certified: 5 BOD, 6 TSS and 10 TN) from straight septic wastewater – no preceding septic tank necessary. No moving in-tank parts. The CEN5 is compact (about 8' x 4'), lightweight (about 475 lbs), highly maneuverable and features a low power draw (one 80 L/min blower drawing 1.27 kWh/day), plug & play installation and optional wireless telecommunication package that offers both dial and text capabilities. This model series is producing best-in-class denite numbers in multiple U.S. states.	
	Commercial Systems	1,350 to 6,000	2006 Japan 2015 US	Commercial Fuji Clean systems provide all benefits of smaller systems – just scaled up in size. Fuji Clean's largest CE commercial system, the CE6KG, is now available to supplement its existing CE21 (1,900-gpd), CE30 (2,700-gpd) models and CEN21 (1,900-gpd). The CE6KG, which can treat up to 6,000-gpd, uses the same treatment technology, process flow and one-tank structure as the smaller CE systems and can be squeezed into the tightest of commercial sites with a footprint of only 36' x 6.5' (including built-in septic tank). Now available to supplement its existing CE14 (1,350-gpd), CE21 (1,350-gpd), CEN14 (1,350-gpd) and CEN21 (1,900-gpd).	
 <p>Geomatrix Systems, LLC 114 Mill Rock Rd. E Old Saybrook, CT 06475 860-510-0730 info@geomatrixsystems.com www.geomatrixsystems.com See ads on pages 15, 33</p>	SoilAir	1 - 100,000+	1998	SoilAir is a patented technology that intermittently aerates the leach field and the surrounding soils rather than continuously aerating the wastewater in a tank. The soils in the leach field become a massive enhanced treatment system. Since air has 21,000 times the capacity to hold oxygen than water, this process provides unprecedented rejuvenation of failed septic systems, extends the lifespan of new leach fields and enhances treatment. SoilAir is effective at treating high strength wastewater and has been successful at oxidizing ATU sludge out of systems. SoilAir's systems have been extensively tested.	US and Canada
	GeoMat	1 - 100,000+	2005	The GeoMat passive treatment and leaching system is ultralow profile, designed for maximum treatment and infiltration. GeoMat is 1" thick and available in widths of 12" and 39". It is comprised of an entangled filament core, a hydroscopic membrane and an internal gravity or LPP pipe. The shallow burial depth and high surface area to void space ratio of GeoMat results in unprecedented aeration. This increased oxygen results in increased removal of pathogens, B.O.D., T.S.S., and nutrients such as nitrogen and phosphorus. When installed on 6" of specified sand, GeoMat treatment levels have been tested to meet NSF/ANSI Standard 40.	Many States, Contact Manufacturer
 <p>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 19</p>	JCP	1,500 to 300,000	1970	Jet's Commercial Wastewater Treatment Extended Air and MBBR Plants are modular in design, can treat flows from 1,500 to 300,000 gallons of wastewater per day and allow for phased build out. This makes it possible for motels, shopping centers, restaurants, and service stations to be constructed along interstate highways far from any town. Factories and Subdivisions can be developed miles beyond sewer lines. Time-tested plants treat wastewater through the performance-proven aerobic digestion process that enables microscopic living organisms to transform wastewater into a clear, odorless liquid. Jet offers assistance with design, engineering, and construction as well as onsite 24/7 tech support, plant start up commissioning and operator training.	US and International
	J-Series	500 to 1,500	1993	J-Series BAT Media Plant is a natural, organic, chemical-free system that uses nature's own resources to reduce wastewater to a clear, odorless liquid in just 24-hours. Employing the patented Biologically Accelerated Treatment process that supplies oxygen to naturally occurring microorganisms found in wastewater. Microorganisms attach themselves to the submerged Jet BAT Process Media, forming a "Biomass" to quickly and effectively treat wastewater. The 700 Series Aerator supplies the oxygen and the mixing that supports our exclusive treatment process, converting wastewater into colorless, odorless liquids and gasses. The J-Series, tested to NSF Standard 40, is available in 500 to 1,500 gpd in concrete and 500 to 800 gpd in a seamless plastic tank. Multiple system control options are available.	
	CF-Series	500 to 1,500	2008	Jet's Nutrient Reducing BAT Media Plants offer variable capacity in a NSF-40/245 tested treatment system. The J-1500CF Series provides complete effluent treatment from 500 to 1,500 gpd. The 500 and 800 gpd PLT Series tanks are the lightweight, rotational molded alternative to the concrete J-1500CF Series. The seamless polyethylene tanks are easy to transport and install in the most difficult site conditions. J-1500CF Series utilize the proven 700++ aerator, effluent filter and the Jet 197 Control panel. The 197 Control panel cycles the aerator to reduce the nitrogen by over 60%.	
	R-Series	450 to 1,400	2016	R-Series utilize time proven BAT Media, Jet 700++ aerator and the Illumi-Jet UV Disinfection Unit to meet NSF Standard-350 for applications that require shallow discharge, direct discharge or reuse. The R-Series Plants offer variable flow capacity from 450 gpd to 1,400 gpd in precast concrete and seamless, polyethylene tanks. The polyethylene tanks handle from 450 to 750 gpd that are the lightweight, rotational molded alternative to the concrete version. The seamless polyethylene tanks are easy to transport and install in the most difficult site conditions.	

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTORS IN
Knight Treatment Systems 281 Cty. Rd. 51A Oswego, NY 13126 800-560-2454 Fax: 315-343-2941 mark@knighttreatment.com www.knighttreatment.com See ad page 37	White Knight	Scaleable	2010	The White Knight Microbial Inoculator Generator from Knight Treatment Systems offers an enhanced form of aerobic treatment technology that introduces, cultivates and releases selected microorganisms. It is designed to be simple to install in most septic tanks. It can be used to retrofit outdated ATUs and package treatment plants and enhance the performance of community and high-strength wastewater treatment systems in addition to septage processing facilities.	US, PEI, Eastern Caribbean
 MST Manufacturing, LLC 23362 Medero, Ste. C Mission Viejo, CA 92691 877-473-7842 • 949-297-4590 Fax: 949-916-2093 microseptec@microseptec.com www.microseptec.com	EnviroServer	600, 1,200 and 2,500	1998	The EnviroServer ES is a combination of primary treatment, flow equalization, and secondary treatment by both fixed-growth and suspended-growth aerobic processes. The system consists of five chambers in one compact pre-engineered unit. The first chamber is a primary clarifier, the second chamber is the first aeration zone, the third chamber is the second aeration zone, the fourth chamber is the final clarifier, and the fifth chamber is the effluent chamber where an optional pump(s) and disinfection device may be installed.	AZ, CA, DC, DE, MD, NJ, NV, PA, VA
 <i>Engineering the future of water and wastewater treatment</i> Norweco, Inc. 220 Republic St. Norwalk, OH 44857 800-667-9326 • 419-668-4471 Fax: 419-663-5440 email@norweco.com www.norweco.com See ad page 13	Singulair Model 960 and Model TNT (Total Nitrogen Reduction) Singulair Green Model 960 and Model TNT (Total Nitrogen Treatment) Hydro-Kinetic Singulair R3 and Singulair R3 Green Singulair Solar	500 to 1,500 600 500 to 1,500 500 to 1,500 500 to 1,500	1996, 2006 2010 2012 2018 2020	The Singulair system is the state-of-the-art alternative to a troublesome septic tank for domestic wastewater treatment. Employing the extended aeration process, the Singulair plant provides flow equalization, pretreatment, aeration, clarification, tertiary filtration and optional chemical addition within a single precast concrete tank. Designed for domestic wastewater flows ranging from 500 to 1,500 gpd, performance of the Singulair system is certified by NSF International (Standards 40 and 245) and the Canadian Standards Association. The Singulair Green aerobic treatment system incorporates Norweco's advanced aerobic treatment process into a durable, watertight polyethylene tank. It is ideal for new or retrofit applications and can be installed easily in the most difficult jobsite with just a backhoe. Incorporating support ribs and inherently strong arch shape, the durable Singulair Green tank will provide decades of reliable performance. Designed for domestic wastewater flows up to 600 gpd, with treatment performance meeting or exceeding the strictest state and county requirements, Singulair Green is certified by NSF International (Standards 40 and 245). The Hydro-Kinetic wastewater treatment system employs innovative Hydro-Kinetic filtration technology to produce the cleanest, most consistent effluent quality available. The Hydro-Kinetic system uses extended aeration and incorporates both suspended and attached growth processes to treat wastewater. The patented Hydro-Kinetic Bio-Film Reactor provides final treatment of the wastewater to a near pristine state. The Hydro-Kinetic system is the only NSF/ANSI Standard 40 and 245 certified residential wastewater treatment system to pass two consecutive tests without performing routine maintenance for a full 12 months. The Hydro-Kinetic system exceeds regulatory standards and is certified and listed to BNQ Standards CAN/BNQ 3680-600 and NQ 3680-910. The Singulair R3 reduces water consumption, reuses treated effluent and recycles water to conserve and recharge our groundwater. It provides the cutting-edge solution to chronic water shortages and reduces energy costs of water and wastewater treatment. The system efficiently treats incoming wastewater to the highest level for restricted indoor and unrestricted outdoor use. Singulair R3 system exceeds the effluent requirements of NSF/ANSI Standards 40, 245 and 350. The Singulair Solar system delivers an environmentally friendly solution for onsite wastewater treatment by utilizing renewable solar energy to generate electricity. Solar power is a 100% clean, renewable energy source that offers year round efficiency and reduces your carbon footprint. Singulair Solar technology requires no moving parts, providing quite, efficient operation with minimal maintenance.	North America, Central America, South America, Europe, Africa and Middle East
 Orenco Systems, Inc. 814 Airway Ave. Sutherlin, OR 97479 800-348-9843 • 541-459-4449 info@orencosystems.com www.orencosystems.com See ad page 7	AdvanTex AX-RT AdvanTex AX-100 AdvanTex AX-Max	Up to 750 2,500 to 12,000 1,750 to 100,000	2000 2002 2010	The AX-RT is a "plug and play" wastewater treatment system that can be shallowly buried and installed right behind a septic tank, as easily as a septic tank. Its compact design fits on small lots and reduces costs for excavation and installation. That means property owners (residential and small commercial) can buy AdvanTex quality at a competitive price. The AX-RT is designed to be easily maintained with an annual service call, thanks to its accessible, cleanable filters and media. And its high-quality, high-head pumps have been known to last over 20 years (as seen in the Elkton, Oregon, sewer system). Orenco's patented AdvanTex Treatment Systems include the compact AX-100, which offers a small footprint, making it a viable option for small sites. It works as efficiently as a sand filter, enabling treatment of high-volume commercial and multi-family flows in tight spaces. The AX-100 is a premanufactured package, including the textile media, and has low maintenance requirements, low power use, and low life-cycle costs. It provides consistent, reliable treatment, even under peak flows, producing clear effluent that's ideal for reuse. The AX-Max is a completely integrated, fully plumbed, and compact wastewater treatment system for commercial properties and communities. It's ideal for projects with strict discharge limits, limited budgets, and part-time operators. Like all AdvanTex Treatment Systems, the AX-Max is a recirculating media filter that produces outstanding effluent that's suitable for reuse, with significant nutrient removal. AX-Max systems are highly energy-efficient and require minimal operation and maintenance.	North and Central America, Australasia, Europe, and Africa

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTORS IN
 <p>Presby Environmental, Inc. Presby Environmental 143 Airport Rd. Whitefield, NH 03598 800-473-5298 • 603-837-3826 Fax: 603-837-9864 info@presbyeco.com www.presbyenvironmental.com See ad page 5</p>	Advanced Enviro-Septic	Varies	1995	Advanced Enviro-Septic (AES) is a combined treatment and dispersal system. This effective and non-mechanical onsite system is designed for residential, commercial, and community use. AES has been proven to remove up to 99% of wastewater contaminants without the use of electricity or replacement media. AES does this quickly and naturally establishing multiple bacterial treatment environments throughout the system that break down and digest wastewater contaminants leaving the septic tank. This passive process allows the system to discharge highly purified wastewater, preventing soil clogging and groundwater contamination. AES has third party certifications from NSF, Cebedeau, BNQ, and SAI Global.	Worldwide
<p>Zoeller Pump Company 3649 Cane Run Rd. Louisville, KY 40211 800-928-7867 • 502-778-2731 www.zoellerpumps.com See ad page 31</p>	Z-Cell High Performance Wetland	450 to 36,000+	2001	The Z-Cell technology can be used in residential, commercial, or small community applications for treating residential strength septic tank effluent. The Z-Cell is a timed dose system and the wastewater has a 36" vertical path to an outlet pipe below the wetland's surface. By moving water vertically, the fluid must pass through the horizontally oriented plant root zone. This eliminates short circuiting, an issue common in conventional constructed wetlands. During the growing season, evapotranspiration through plant leaves reduces the hydraulic load to downstream components. Produces better than secondary quality effluent.	Contact Manufacturer
	Recirculating Media Filters	450 to 36,000+	2001	Designed for use in residential, commercial, or small community applications for treating residential strength wastewater from a septic tank. Treatment occurs below grade as the fluid trickles down through the pore spaces of the media where aerobic organisms feed on the nutrients. Effluent leaves the system through an outlet pipe in the bottom of the filter. Multiple RMFs can be used together when greater capacities are needed. Effluent can be discharged above or below grade. Above grade disposal must meet local health codes or guidelines. Produces better than secondary quality effluent.	Contact Manufacturer
	Fusion	450 to 800	2006	Drop-in wastewater treatment units that use anaerobic and aerobic zones to produce secondary quality effluent. The "drop-in" system is easy to install and maintain. Filter media are never removed or replaced. Key operating features include the constant recirculation of treated wastewater and a twice-daily automatic backwash cycle that returns residual sludge to the head of the system. A quiet, programmable compressor delivers oxygen to aerobic zones, while consuming as little energy as a 65-watt light bulb. The Fusion's unique design enables it to be installed without a pretreatment tank, making it ideal for use on sites where space is limited.	AL, AR, MI, NY, OH, VA

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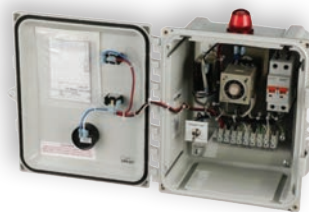
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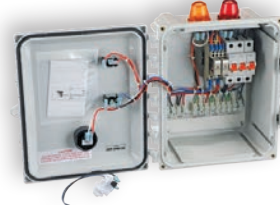
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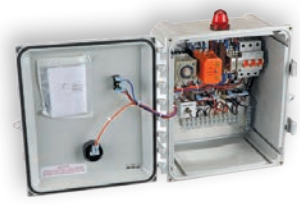
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Installers Make All the Shots in Golf Course Upgrade

Golfers play through while an efficient system using White Knight aerobic units and Eljen GSF is added to a Wisconsin course

By David Steinkraus

For some years, the Fox Hollow Golf Course in western Wisconsin depended on holding tanks for its wastewater, but then the county informed owner Dave Cornell that a better solution was required. However, the course was surrounded mainly by small subdivisions and had little land to spare.

Dan McHugh, owner of McHugh Excavating and Plumbing in nearby Onalaska, Wisconsin, was brought in on the project in 2018 to look at solutions to the lack of space. A discussion among all the experts ultimately involved — including McHugh, Mark Prevost of First Supply, and Dale Schlieve, a septic

designer and owner of CEC in Rhinelander, Wisconsin — produced an answer: aerobic treatment with White Knight units discharging to an Eljen GSF system built inside a very large box to save space. This is apparently the largest boxed Eljen system in existence.

Although he's done larger Eljen systems, for example in a Northwoods camp, this one was unusual because of that space limitation, Schlieve says.

"You don't want to interfere with the play, so we were limited where we could go," he says. "You save a lot of room by building up without the end slopes, upslopes and downslopes."



▲ Jim Larson and Zeik Hellerude position spacers to hold laterals in place on top of the Eljen GSF units at the Fox Hollow Golf Course near La Crosse, Wisconsin. (All photos courtesy of Jim Larson and Mark Prevost)

» Jim Larson, left, and Zeik Hellerude, right, prepare to install the White Knight units. The plastic buckets are spacers, just the right dimensions to hold the units at the specified height inside a concrete tank.

» Eric Daniels with Eljen Corp. looks over the big bed as the crew adds insulation and a plastic liner to protect the drainfield from Wisconsin's winter.



THE SYSTEM

Wastewater exits the clubhouse building through a 4-inch Schedule 40 PVC pipe. After about 15 feet, the pipe empties into a three-chamber 5,000-gallon concrete septic tank set deep to catch influent from the clubhouse and a tavern in the same building. The tank, and others in the treatment train, came from Crest Precast in nearby La Crescent, Minnesota, on the other side of the Mississippi River.

The first chamber captures grease, the second is septic, and the third equalizes flow. Wastewater next flows by gravity through an Orenco filter and into a 3,000-gallon pump tank. A pair of Goulds WE05H pumps sends wastewater through two Sim/Tech filters and into a pair of 4,000-gallon tanks connected in series. These hold a total of eight White Knight treatment units. A 3,000-gallon dosing tank is last. Two Goulds WE057 pumps, also with Sim/Tech filters, send water out to the mound.

A panel from SJE Rhombus controls the system.

A 200-foot run of 2-inch Schedule 40 PVC carries water from the dosing tank to the center of the mound, where a manifold splits the flow into laterals on top of the Eljen GSF units. The mound box is 14 feet 8 inches wide, 48 inches high and 178 feet long. It is built with cement landscaping blocks, so the finished system looks like a decorative bed where it sits next to the driving range.

Inside the box are about 550 yards of C33 sand. Because the box sat on a slight slope, one end has about 18 inches of sand between grade and the Eljen units, while the other end has about 30 inches of sand. About 17 inches of sand cover the Eljen units.

System Profile

Location:	La Crosse, Wisconsin
Facility served:	Fox Hollow Golf Course
Designer:	Dale Schlieve, Rhineland, Wisconsin
Installer:	Gerke Excavating, Tomah, Wisconsin
Type of system:	White Knight aerobic treatment with Eljen GSF dispersal field
Site conditions:	Heavy clay
Hydraulic capacity:	2,300 gpd

To do the job, the team used a Cat 336 excavator, a John Deere 85 excavator and a Cat 289 track loader from Gerke Excavating. (Between the time the project began and ended, McHugh sold his business of 40-plus years to Gerke Excavating of nearby Tomah, Wisconsin.)

A number of Gerke's Kenworth quad-axle dump trucks, all no more than about three years old and with bodies from Michaels Truck Equipment in La Crosse, Wisconsin, brought in all the sand.

CHALLENGES

Schlieve says his major challenge was figuring out the daily flow. Water use records were kept for the entire two years that the project was in the works, so there was a lot of information, he says. To arrive at a solid design flow number, he says, all the collected data had to be examined and adjusted to account for days of high and low usage of the course.

SYSTEM PROFILE



◀◀ With the Eljen units in place, Jim Larson and Zeik Hellerude lay geotextile fabric and begin adding sand.

▼ The box for the Eljen GSF mound is built of cement landscaping blocks so the onsite system looks like a decorative bed.



says, and Prevost told him a 5 gallon bucket is just the right height. Larson used a hole saw on the buckets to ensure they won't hold air, then fastened them to the bottoms of the White Knight units with stainless steel screws.

Tanks were buried near the clubhouse and next to a county road. That was OK except for the power lines overhead, McHugh says. Workers from the local utility came out to stabilize a utility pole and its transformers while the crew was digging beside it.

Installing two tanks under the power lines required the use of a 135-ton crane from Modern Crane Service in Onalaska. First the crane lifted the tanks off the truck and over the wires, setting the tanks on the ground. Then the crane reached under the wires, picked up the tanks and set them in their holes. (Other services came from Viking Electric in Holmen, Wisconsin, and Christen Nursery in Onalaska.)

While the system was being installed, the golf course remained open and relied on a holding tank that was pumped frequently, McHugh says. On the last day, the clubhouse had to close while the crew made the final connections to the new system. They started at 7 a.m., McHugh says, and were done by 10 a.m. ◻

“You don't want to interfere with the play, so we were limited where we could go. You save a lot of room by building up without the end slopes, upslopes and downslopes.”

Dale Schlieve

“That's why we time-dosed the system, to take care of the peak times over a longer period of time,” Schlieve says.

Final flow numbers went to Knight Treatment Systems so they could calculate the number of White Knight units and tanks required, he says. The final design has extra capacity built in to handle extremes, he adds.

Installation by a crew of two took about three and a half weeks in October 2020, minus a couple of days lost to rain, McHugh says. That crew was Jim Larson, a longtime McHugh employee who served as plumber, equipment operator and foreman for the job. Also on the crew was Larson's son-in-law Zeik Hellerude.

Larson, now a foreman/equipment operator for Gerke, says he had done one other Eljen installation, so he was familiar with the technology. The Fox Hollow job went smoothly other than taking more time because of the size of the mound, he says.

One nonstandard piece of equipment he used was 5 gallon plastic buckets. White Knight units must be at a specific height inside a tank, Larson

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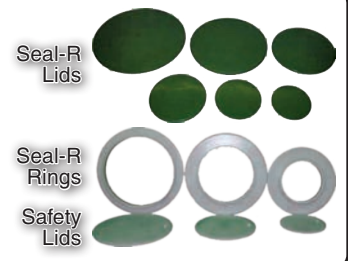
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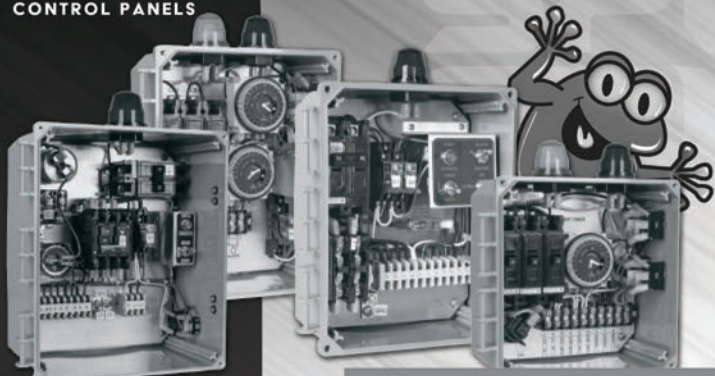
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Designer Certification Ensures Quality Onsite Systems for Homeowners

It's still slow going, but Saskatchewan is moving toward better system design requirements

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 Saskatchewan Onsite Wastewater Management Association.



Travis Wolfe
project manager

Business: Anderson Pump House, a division of Aquifer Distribution, both family-owned Saskatchewan companies, with locations in Saskatoon, North Battleford, Prince Albert and Regina

Services we offer: We are a distributor for pumps, water treatment, wastewater and plumbing equipment.

Years in the industry: 20

systems being installed by noncertified people who do not fully understand the Saskatchewan Onsite Wastewater Disposal Guide. Our province recently combined all 12 previous health regions together, but even under one region, the guidelines are not being consistently followed or enforced. For example, some areas would only approve designs by certified contractors, while other areas don't recognize the value of this at all. Most homeowners do not realize this and can see huge price differences because one contractor knows how to implement the guidelines, while another just meets minimum guideline standards. Homeowners do not know that satisfying minimum guideline standards does not guarantee a wastewater system will work.

Our crew includes:

Our foreman at Anderson Pump House, Guy Steel, has played a huge role in our service department. His experience and product knowledge gained over the last 20 years have been very valuable to us. Two local health officers, Roger Piatt and Ken Startup, have been leaders in promoting SOWMA guidelines on how to properly design and install wastewater systems.

Typical day on the job:

Most of my day is spent selling, designing, quoting and troubleshooting water and wastewater systems. But I also get to break out of the office to perform site visits or commission projects.

The job I'll never forget:

Early in my career, I worked as a summer laborer — my first lift station job. Our project included replacing the pumps, rails and piping. First we had to remove the old equipment, which definitely didn't look new anymore. I quickly realized that designing and sales looked a lot less dirty.

My favorite piece of equipment:

The SJE Rhombus pump control products have lots of options that make contractor jobs very easy. Plus, Goulds, Myers and Barnes have developed very reliable pump options.

Most challenging site I've worked on:

While it's not necessarily challenging, the most exciting project involves working with some of our First Nation communities. Lately they have been very interested in learning how to implement the new Saskatchewan Onsite Wastewater Guidelines for their residential sites.

Association involvement:

I became a member of the Saskatchewan Onsite Wastewater Management Association (SOWMA) in 2008 when it started. I've been the president for the last three years.

Benefits of belonging to the association:

The association helps professionalize the wastewater industry. We offer a practitioner training program that is recognized in the western provinces, and we offer education days to promote good practices. SOWMA has been a strong influencer in the industry for protecting groundwater aquifers by promoting wastewater treatment instead of wastewater disposal.

Biggest issue facing your association right now:

In Saskatchewan, it is not regulated that a contractor needs to be certified to design or install wastewater systems. So we still have some

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Oops, I wish I could take this one back:

I think the industry got a black eye because of the premature failure of some of the systems that were designed 20 years ago using percolation tests. Most contractors now realize that test pits and soil investigation provide better information for protecting the water aquifers and environment.

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

A homeowner drove over his Type II mound with a large tractor and broke the header pipe. The Type II mound was originally installed by one of our contractors. The homeowner asked if we would fix the broken pipe under warranty because the contractor didn't install it correctly. Obviously the contractor wasn't going to fix the pipe for free, so the homeowner figured we were responsible because the materials came from us.

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

All acreage owners should be required to present a copy of their wastewater system design before they can sell their acreage. I think this would help prevent cheaper systems from being installed and protect the homeowners.

Best piece of small business advice I've heard:

Be honest, admit your mistakes and try your best to help people. That usually opens the door for opportunity and allows you to have some fun at work.

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

Designing systems and helping people size multiple equipment so they work together properly has been very enjoyable, so if I weren't doing this it would have to be another industry that included both designing and sales.

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

I think we are going in the right direction in Saskatchewan. Most wastewater contractors in our province became certified before the government even required it. Contractors want this industry to become more professionalized, which would benefit homeowners with better wastewater systems and protect the environment. □

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.

PRODUCT SPOTLIGHT

BioMicrobics RetroFAST aims to extend life of aging or failing septic systems

By Tim Dobbins

The effectiveness of conventional septic systems and their drainfields can deteriorate over time from biological failure, costing homeowners thousands in drainfield replacements and re-landscaping.

The RetroFAST system from BioMicrobics is designed to aid in biological rejuvenation for aging or failing septic systems and help drainfields recover before costly repairs are needed. As conventional systems get older, the layer of biological slime that grows in the trench areas of the drainfield, known as a biomat, can become too thick, resulting in poor percolation forcing the normal flow of wastewater to surface into the soil above or back up into the distributing piping.



“Failed septic systems announce themselves with soggy lawns and backed-up plumbing,” says Jennifer Cisneros, vice president of marketing for BioMicrobics. “The traditional fix requires digging a new drainage field in another part of the yard. The RetroFAST gets water flowing with minimal digging.”

The device is engineered to work inside the existing septic tank. After self-expanding chambers are inserted, they are attached to a regenerative air blower located above ground. Aeration raises the dissolved oxygen levels to accelerate the breakdown of the pollutants causing clogs.

The RetroFAST system is designed to biologically combat the issue in two ways.

“First, RetroFAST’s aerobic treatment process removes the organic matter that originally formed the clogging layer,” Cisneros says. “Second, RetroFAST’s oxygenated effluent, containing dissolved oxygen, fosters the development of aerobic bacteria in the soil that will naturally digest the existing clog.”

According to BioMicrobics, FAST systems are designed to consistently deliver an average of 95% BOD5 reduction and 70% total nitrogen reduction depending on the application and will reliably provide dissolved oxygen to the drainfield.

They are not only effectively used as a repair, but also applicable in new septic systems. “The RetroFAST will consistently deliver high levels of treatment — 90-95% of treatment in the tank — and provide dissolved oxygen to the drainfield,” Cisneros says. “This helps to assure the clogging layer is reduced or never forms in the first place.”

RetroFAST systems are available in sizes to fit various applications from one-person dwellings to households with eight people. The RetroFAST 0.150 is designed for 150 gpd, the 0.250 unit is for up to 250 gpd and the 0.375 unit will handle 375 gpd. The package ships fully assembled and includes a collapsible module liner, mounting tabs, attached growth media blocks, airlift assembly, plastic cover for access lid, PVC vent/cleanout assembly and an air blower with plastic blower housing. 800-753-3278; www.biomicrobics.com □

Grundfos high-efficiency IE5 motors and pumps

Grundfos’ E-pumps with integrated frequency converters are designed for total control, customer convenience and environmental sustainability. Grundfos’ MGE E-motors exceed the IE5 requirements by more than 2% with a motor efficiency of 95.7% at 380 V/2,600 rpm. The built-in application control in MGE E-Motors reduces energy consumption of the pump and optimizes the performance and efficiency of the entire system. The permanent magnet synchronous motors (PMSM) are designed for frequency converter operations and optimized for pump applications and high part-load efficiency. The PMSM also has a built-in frequency converter for variable-speed operation with benefits in pump applications ranging from energy savings, process control, extra functionalities, built-in motor protection, higher performance and more compact pumps, reduced water hammer due to long ramp times and low starting currents. 800-926-6688; www.grundfos.com/us



Franklin Electric Little Giant 16G Series 1 hp grinder pump

Franklin Electric’s Little Giant 16G Series is a heavy-duty 1 hp grinder pump designed to deliver power as a new or replacement pump for challenging residential and light commercial wastewater applications. It is available in both 115 V or 230 V models. The cutting mechanism produces over 745,000 cuts per minute and is based on the patented design used in larger Franklin Electric models. The class F motor provides optimal power to prevent flushables and other debris from clogging and causing downtime, while the discharge is customizable to a contractor’s needs. Installers can choose to use the 1 1/4-inch discharge or utilize the 2-inch adapter pre-assembled to the pump as a drop-in replacement for any effluent or sewage pump struggling with clogs and binding, regardless of discharge size. 866-271-2859; www.franklinengineered.com □



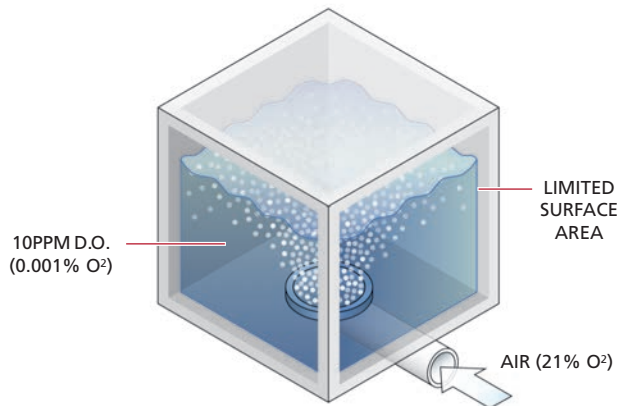
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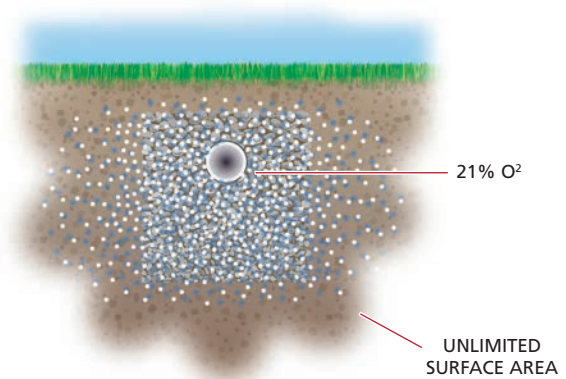


Conventional: Box system has limited surface area for treatment. Water holds 21,000 times LESS oxygen than air.

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Advanced Treatment Units

By Craig Mandli

ADVANCED TREATMENT UNITS

Delta Treatment Systems ECOPOD

The ECOPOD for advanced wastewater treatment from Delta Treatment Systems is a series of products that are easy to install, low maintenance and effective in reducing levels of nitrogen, BOD and TSS. The design is simple, can treat 500 to 1,500 gpd for residential systems and up to 250,000 gpd for commercial systems, and is NSF/ANSI 40 and 245 certified. The intratank bioreactor can be inserted into an average sized round or rectangular concrete, fiberglass or plastic onsite wastewater treatment tank or vault. It uses a fixed-film process that is stable, reliable and robust, according to the maker. It is customizable for individual residential installations, cluster designs and small- to medium-size commercial applications. The ECOPOD system is FHA- and VA-acceptable and is suitable for intermittent usage. Minimum sludge production reduces pumpout frequency, and a remote monitoring system is available. 800-219-9183; www.deltatreatment.com



MicroSepTec EnviroServer ES

The MicroSepTec EnviroServer ES series utilizes five chambers to achieve primary settling, treatment and clarification in one tank. The units use a moving-bed biological reactor made specifically for the residential market. The first compartment of the system is the primary clarifier for settling sludge and solids. The second section houses the first of two aeration chambers and contains biomedium providing surface area to promote a healthy population of microorganisms. The third compartment is used for further aeration to amplify the growth of nitrifying bacteria and the process of nitrification. The fourth chamber is the final clarifier where suspended solids settle out. Wastewater is then recirculated back to the primary clarifier in the first compartment, which contains enough carbon to promote denitrification removing high levels of nitrate. Clarified water then moves through an effluent filter before entering the fifth compartment, an effluent chamber for storage. 877-473-7842; www.microseptecc.com



NextGen Septic technology

Treated water exiting NextGen Septic technology meets higher water-quality standards than treated water leaving a typical centralized wastewater treatment plant. The system is suitable for sites traditionally requiring costly drainfield construction due to size restrictions and/or hilly, rocky, clay or sandy soil conditions. It is approved for surface discharge in Kentucky, and it uses a combination of anoxic treatment of the raw wastewater followed by aerobic degradation of the contaminants. An ultra-filtration membrane further treats the water before being disinfected using ozone. Treated water has less than 15 mg/L of BOD5, less than 2 mg/L ammonia, less than 1 mg/L phosphorus and no TSS. Ozone decomposes to oxygen, which increases the dissolved oxygen level in the discharged water. This treated water can be used for irrigation or to resurrect a clogged leachfield. 513-673-3583; www.nextgensепtic.com

Presby Environmental Advanced Enviro-Septic

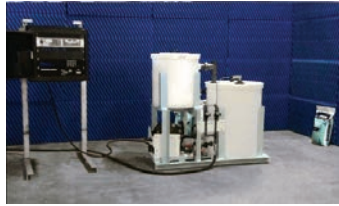
Advanced Enviro-Septic (AES) from Presby Environmental is a combined treatment and dispersal system for residential, commercial and community use designed to remove 99% of wastewater contaminants. It requires no replacement media or additives and no electricity or mechanical devices. The NSF 40 Class 1 certified system treats effluent efficiently, providing long system life and protecting the environment, according to the maker. It quickly and naturally establishes multiple bacterial treatment environments throughout the system that break down and digest wastewater contaminants that leave the septic tank. Following the filtering of suspended solids, it releases highly purified wastewater to the soil, recharging the groundwater and preventing soil and groundwater contamination. It is BNQ certified for secondary and advanced secondary treatment. 800-473-5298; www.presbyeco.com



DISINFECTION

Scienco/FAST - a division of BioMicrobics SciCHLOR

SciCHLOR from Scienco/FAST - a division of BioMicrobics is a sodium hypochlorite generator designed to give a large span of markets a safe and effective way to disinfect. With salt, water and electricity, the system with multipass SciCELL electro-chemical activation technology will produce an available supply of 10 to 60 pounds chlorine-equivalent/day sizes. Connected to an incoming water source and with multiple operating modes, the brine solution makes multiple passes through the low-voltage DC electrolytic cell to provide a reliable method for the needs of medium to large onsite disinfection applications. Its recirculation method keeps control of desired chlorine concentration while the assembly minimizes maintenance downtime. 866-652-4539; www.sciencofast.com



NITROGEN REDUCTION SYSTEMS

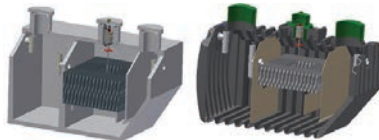
Eliminite Commercial C-Series

The Commercial C-Series system from Eliminite is designed to provide reliable treatment with emphasis on total nitrogen reduction for high-strength waste applications such as work camps, RV parks, restaurants, ski and golf resorts, breweries, mines and agricultural operations. It is designed to work with locally sourced tanks and components when possible. MetaRocks treatment media is designed to withstand a variety of high-strength waste-loading scenarios, particularly where clogging and odor control are major considerations. The system is scalable and may be adapted to suit specific phasing requirements, site constraints and unique demands. 888-406-2289; www.eliminite.com



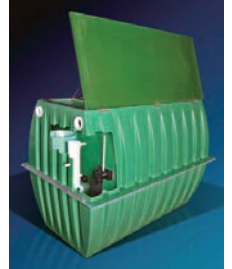
Jet Inc. J-1500CF Series

The J-1500CF Series nutrient-reducing BAT media plant from Jet Inc. offers variable capacity in an NSF-245-tested treatment system. It provides complete effluent treatment from 500 to 1,500 gpd. The 500- and 800-gpd PLT Series tanks are the lightweight, rotational molded alternative to the concrete J-1500CF Series. The seamless polyethylene tanks are easy to transport and install in difficult site conditions. The system uses a 700++ aerator, effluent filter and the Jet 197 control panel, which cycles the aerator to reduce nitrogen by over 60%. 800-321-6960; www.jetincorp.com



Orenco Systems AdvanTex AX20-RTUV

The AdvanTex AX20-RTUV treatment system from Orenco Systems is a self-contained module designed to treat typical septic tank effluent to better than secondary standards, with nitrogen reduction and UV disinfection. It is designed for homes with up to four bedrooms and suited for small sites with poor soils or sites requiring shallow burial. It helps protect surface waters and aquifers and can be an effective solution for areas that have strict discharge limits, according to the maker. It is installed following a septic tank equipped with Biotube effluent filters. The unit eliminates the need for separate recirculation, treatment, discharge and disinfection tanks and basins; and it reduces the number of risers and lids needed in the treatment train. 800-348-9843; www.orenco.com



RECIRCULATING FILTERS

Anua BioCoir

The BioCoir recirculating media biofilter from Anua is designed to be simple to install and easy to operate. It provides stable treatment across a broad range of applications with no constantly running noisy blowers or motors, according to the maker. It uses coconut coir media housed in a preassembled pod. Coir refers to the fibers that make up the thick husk of a coconut. The coconut fiber is low cost, an upcycled resource and high in lignin content, which results in a durable material. Pre-treated effluent is time-dosed over the media using helical spray nozzles to provide uniform distribution. Treatment is optimized by recirculating effluent through the media multiple times. It is certified to NSF/ANSI Standard 40, Class I and third-party tested to reduce nitrogen by more than 50%. Residential and commercial configurations are available. 336-547-9338; www.anuainternational.com



Clarus Environmental WW4

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



SeptiTech STAAR

Designed for both multifamily domestic and high-strength commercial wastewater, SeptiTech STAAR (Smart Trickling Anaerobic/Aerobic Recirculation) filter systems range from 100 to more than 150,000 gpd treatment applications. The technology allows for simple, automatic and reliable equalization and clarification processes. The biological trickling filter technology also maintains low levels of Nitrate-N and achieves lower operating costs and power requirements with all below-grade components that fit readily in available concrete, plastic or fiberglass tanks. It is suitable in areas where large tracts of land are not available for land intensive wastewater treatment systems, and it may qualify for equivalent secondary discharge standards. Systems are appropriate for small-to-medium-sized communities to rapidly reduce soluble BOD5 with efficient nitrification and denitrification for environmentally sensitive areas. They utilize partially submerged media to treat high organic loads with durable process elements and low power requirements. 207-333-6940; www.septitech.com



UV DISINFECTION

Polylok PL-UV1 UV Disinfection Unit

The PL-UV1 UV Disinfection Unit from Polylok reduces bacteria levels from secondary effluent to achieve strict water quality standards. Every component of the compact unit is engineered and constructed to provide reliable disinfection and long operational life, according to the manufacturer. It has a dual-pass design, a long-life UV bulb, weatherproof electrical components and no chemical residual or harmful byproducts. It is easy and inexpensive to install and operate, and it has low electrical usage. Rates for gravity flow only are 100 through 8,640 gpd, with 100 through 4,320 gpd with 30 mg/L BOD and 30 mg/L SS, and 4,321 to 8,640 gpd with 10 mg/L BOD and 10 mg/L SS. It offers a UV dose greater than 40,000 microwatt-seconds per square cm at 254 nanometers, with transmissivity of 65%. 888-765-9565; www.polylok.com



SALCOR 3G UV Wastewater Disinfection Unit

The 3G UV Wastewater Disinfection Unit from SALCOR is used for residential, commercial and municipal applications, and it is UL-certified NEMA 6P flood-proof and NSF/Washington State Protocol six-month tested (with 21 upstream treatment systems). It inactivates bacteria/virus pathogens, including superbugs. Rated at 9,000 gpd gravity flow, it is meant as a reliable building block for large water recovery/reuse systems. When installed in 12-unit parallel/series arrays with ABS pipe fittings, systems can disinfect more than 100,000 gpd. Gravity flow equalizes without distribution boxes. Each unit has a foul-resistant Teflon lamp covering, two-year long-life lamp with efficient installation, minimal annual maintenance and energy use of less than 40 watts. 760-731-0745; www.salcor.world

WATER/WASTEWATER REUSE SYSTEM

Norweco Singulair R3 Green

The Singulair R3 Green reduces water consumption, reuses treated effluent and recycles water to conserve and recharge water resources. It provides a solution to chronic water shortages and reduces energy costs associated with water and wastewater treatment. The system quietly, efficiently and automatically treats all incoming wastewater to the highest level for restricted indoor and unrestricted outdoor use. The system exceeds the effluent requirements of NSF/ANSI Standards 40, 245 and 350. It qualifies for green building credits under both the LEED rating system and the National Association of Home Builders ICC 700 National Green Building Standard. By using the system and following local building code, a homeowner can expect to dramatically reduce water usage, according to the maker. 800-667-9326; www.norweco.com



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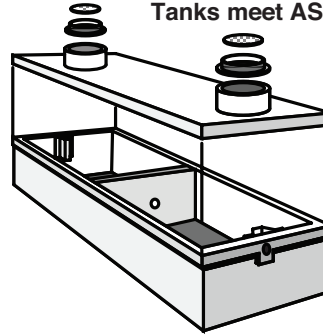
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Advanced Treatment Units

By Craig Mandli

Sand filter system a fit for convenience store advanced treatment unit project



Problem: A gas station and convenience store in Alabama needed a replacement system after the existing drainfield failed. There was no available space on the property, but the owners were able to acquire a small neighboring lot for sale. Soil tests showed 18 inches to the restrictive layer and had a 0.36 gpd per square foot application rate. The store uses approximately 650 gpd.

Solution: A treatment system with a reduced footprint was needed to manage the waste strength and to fit in the available space with a reserved replacement area for a future system. Eljen worked with engineer Jon Perkins to find a solution for the site. The drainfield was designed in a bed configuration, 61 feet long by 31 feet wide, with a 6-inch base of ASTM C33 sand. Ninety Geotextile Sand Filter A42 units were used, with 15 units in six rows. The system is gravity fed, and laterals are “stepped down” to follow the natural contour of the site. Effluent is routed behind the parking areas to a distribution box from the existing septic tank.

Result: The treatment system fits into the available space with room for a replacement area required by local code. The new drainfield and the remaining replacement area are protected from traffic so natural pore space in the soils won’t be compacted. 800-444-1359; www.eljen.com

System increases oxygen levels to avoid effluent surfacing



Problem: A healthcare facility in Old Saybrook, Connecticut, had a long history of septic system performance issues. The system was repaired in 2003 with concrete chambers and began to experience problems within three years of operation, including effluent surfacing that forced the facility’s operators to pump the tank and chambers approximately three times per week.

Solution: All potential solutions were considered, including system replacement and the addition of a tank-based aerobic treatment unit. The most cost-effective solution was to add Geomatrix’s SoilAir to the existing chambers. SoilAir increases oxygen levels to sufficiently aid in the effluent treatment process and is efficient to install and operate. In 2009, a SoilAir system was added to the existing chamber system to increase oxygen levels within the leach field.


Result: Before the addition of SoilAir, 100% of the system was in use; after introducing air, use has fallen to 25%, and the system has not experienced any septic issues in the last decade. The system is monitored through a logic-based control system designed to react to issues before they become problems. Using SoilAir without excavation of the chambers allowed the owners to adopt a normal pumping schedule, removing the scum and sludge from the tank as needed. 860-510-0730; www.geomatrixsystems.com

Onsite system accommodates new build with stringent permit requirements



Problem: To make a proposed gas station/convenience store project a reality, Fairton and its engineering firm, ADR & Associates of Newark, Ohio, looked for a cost-efficient, sustainable and long-term solution that would be easy to operate and consistently meet the stringent permit conditions for BOD, TSS, ammonia and fecal coliforms.

Solution: Fairton & ADR worked with Premier Tech Water and Environment to design and locally source primary reactor and equalization tanks. These are used in combination with Premier Tech's ready-to-use polyethylene Rewatec MBBR and clarifier configuration. With the design and chosen equipment, the treatment process reduces incoming BOD and TSS strengths to low domestic levels. The process is then completed by two Ecoflo biofilters used as polishing units.

Result: Influent numbers ultimately exceeded those in the original design. Due to the COVID-19 pandemic, the system also experienced dramatically reduced flows and dilution. Premier Tech's team worked with the operator to make adjustments that overcame these challenges and brought the system into full compliance. The system continues to show resilience and meets original design parameters on a daily basis to ensure adherence to permit conditions. 800-632-6356; www.pt-waterenvironment.com 



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Long Island Liquid Waste
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National Association of Wastewater Technicians; www.nawt.org; 800-236-6298

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British Columbia Onsite Wastewater Association; www.bcossa.org; 778-432-2120

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

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Manitoba Onsite Wastewater Management Association; www.mowma.org; 877-489-7471

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

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

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

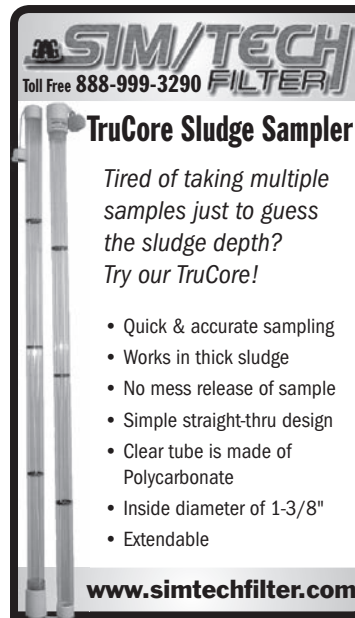
Ontario Association of Sewage Industry Services; www.oasisontario.on.ca; 877-202-0082

SASKATCHEWAN

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

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