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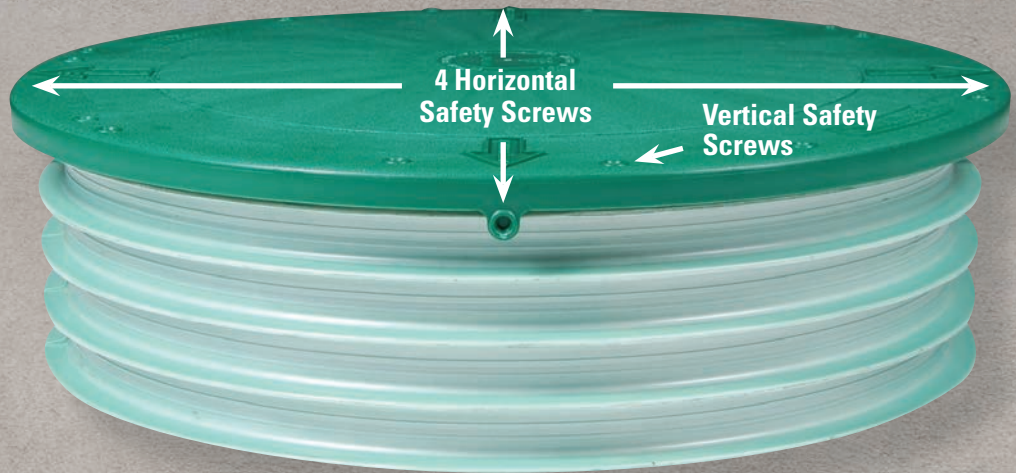


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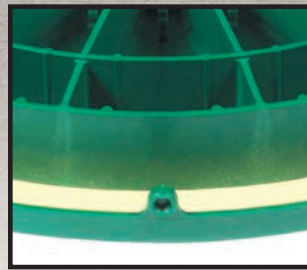
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### INSTALLER PROFILE:

**Onsite in the Ozarks** By David Steinkraus

### ON THE COVER:

The rugged lakes country across the Ozarks region offers up interesting site challenges for the installers at Envirotek Systems in Nixa and Branson, Missouri. Owner Jon Hancock is shown using a Sim/Tech Filter TruCore sludge sampler during an inspection. (Photo by Bruce E. Stidham)

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Be sure to check out our exclusive online content.

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System Profile: Building a mound in a wetland area





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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**

# We All Need to Speak Up for Septic

A Rhode Island town's residents don't want to give up their onsite systems; we can support their argument

**W**henever a community wants to expand its municipal sewer service territory, government leaders are quick to point out the benefits of hooking up the big pipe. Doubtlessly you've heard it many times if you live near a sprawling urban area. They say the expansion represents progress and that it allows property owners with higher wastewater demands to receive more reliable service. These may be businesses, residential health care facilities, and apartment complexes.

Additionally municipal sewer proponents are quick to say it's a good trade-off for homeowners currently being served by onsite wastewater systems; these residents will no longer have to worry about maintenance or repairs on their systems . . . and all they'll have to cover is one small quarterly wastewater bill from the city. Certainly there is a reward for some property owners who fill in their septic tanks and tap into the big pipe.

But this is not always the case. Those who favor constant expansion of municipal sewer lines don't want to hear it, but oftentimes folks are perfectly content with their onsite systems. Their systems function as designed, effectively handling their small-flow treatment needs and return valuable clean water to the groundwater aquifers right in their backyards. They think onsite wastewater treatment is reasonable, prudent and economical.

Such is the case in the town of Coventry, Rhode Island, located just south of Providence, where residents are fighting back against municipal sewer expansion. They don't want to hook up, so they banded together and recently convinced the Town Council to suspend further sewer construction without considering the socio-economic demographic data and impact on neighborhoods.

## HEAR BOTH SIDES

According to a story in *The Coventry Courier* newspaper, a hookup to the new lines costs an average of \$20,000 per property. That's an expense many don't want to bear, especially since they are happy with the performance of their individual septic systems.

"I have a septic tank that works perfectly, and now they tell me I have to come up with another \$20,000. I'm 84 years old. I'm a senior citizen. There is no way I can come up with that kind of money," one resident says. Those thoughts were echoed over and over during a public debate. An engineer at the meeting countered that onsite systems are not meant as a permanent solution to handling wastewater.

"Generally, they fail over time," says Kent Nichols, of engineering firm Weston & Sampson. "A small amount of solids escape the tank. It's not something you can prevent, so over time, the field tends to plug. There are

septic systems that can be in place and appear functional but are not performing up to standard. They can stop treating and discharge things into the environment. Just because the water goes away doesn't always mean it's working."

As professionals in the wastewater industry, you know he is partially right and partially wrong. And he's furthering a common argument made by those who would dismiss decentralized wastewater treatment through broad generalities.

Nichols is right about the potential for failure in onsite systems. But that goes for any system that is not properly maintained by its caretakers — even a municipal sewer system. If any utility, large or small, public or private, is not maintained to an accepted standard, it can stop working effectively. Yes, many homeowners ignore necessary inspection, maintenance, and repair of their septic systems, and they help the pro-sewer faction make its point. As installers, you are constantly engaged in consumer education to change all of that. And I believe your efforts are making a difference.

## A CHANGING DEBATE

Where Nichols is wrong is in not understanding how the debate over onsite wastewater is changing. It is no longer always thought of as a stopgap wastewater solution until a sewer line comes along. Onsite systems are being recognized as a permanent solution and a way to prevent costly expansion of sewer lines. Perhaps Nichols isn't aware of the U.S. Environmental Protection Agency Memorandum of Understanding with numerous onsite septic groups that states decentralized treatment can be a once-and-forever solution for wastewater in many circumstances.

Sure, there's a long way to go to assure the engineers, local governments and general public that septic systems are a safe and effective treatment alternative. Ongoing education programs are a big part of that effort. So is continuing to enhance the technologies used in the onsite industry. The infrastructure of manufacturers are constantly looking for new ways to improve septic system components. It's the job of the entire installer community to preach maintenance and mandatory inspections of aging systems.

Together, with a little help from citizens like those in Coventry, onsite will thrive as a viable alternative to the big pipe.

## COUNTING OUR BLESSINGS

A sanitation story that has spanned the globe in recent months hits home in a sobering way. It involves a centuries-old method of disposing of human





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Many homeowners ignore necessary inspection, maintenance, and repair of their septic systems, and they help the pro-sewer faction make its point. As installers, you are constantly engaged in consumer education to change all of that. **And I believe your efforts are making a difference.**

waste in India called "manual scavenging." Maybe you've never heard this term before, but it explains how waste removal is still done by hand in regions that are still struggling for a basic, safe lifestyle. I am reminded of this practice often through seeing frequent news dispatches about sanitation workers being overcome by hydrogen sulfide fumes and dying. We hear of this happening a few times a year in the U.S., but these tragedies are a regular occurrence in parts of the developing world.

Human rights groups in India have been trying to bring these dangerous working conditions to light through news stories and documentary films. One worker told the Society for Participatory Research in Asia about his experience cleaning septic tanks for years. "There are certain safety measures which are mandatory while going to clean a septic tank air manhole, but I have been working without any apron, safety jacket and no one pinpoints or questions," he explains. Another says, "Once I asked my contractor for safety gear before going down a manhole but that made him only furious and I was thrown out of my job."

Reports indicated that a staggering 22,000 sanitation workers die every year on the job. The *Intercontinental Journal of Human Resources Research Review* in 2014 stated that on average almost 20 sewer workers were dying per

month in Mumbai from suffocation, exposure to toxic gases and other accidents. If you search out this topic on the internet, it doesn't take long to find horrifying video of workers standing in septic tanks, knee-deep in wastewater, pulling out trash or buckets of waste with their bare hands. These images are deplorable and should sadden any of us who enjoy safe working conditions and a privileged life in the Western world.

I applaud anyone who would take action to help change these unsafe practices, but it's easy to feel helpless and overwhelmed at that prospect from halfway around the world. I'm sure many relief agencies and church-based charities in the U.S. and Canada are aware of the suffering of the unfortunate poor in India and countries are trying to make a difference.

These stories should, at the very least, make us thankful that our wastewater industry at home is so far advanced and protects our workers from these tragedies, the general public from disease, and the quality of groundwater and waterways. Sometimes your customers will complain about health department regulations that can raise the cost of installing onsite systems. And I know installers can have difficulty meeting increasing job site safety requirements, for example. But these rules protect people and the environment.

I am humbled and grateful for my own good fortune when I read about ongoing problems with wastewater in other parts of the world. And I appreciate how hardworking installers and onsite system manufacturers are always striving to make this industry better. □

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



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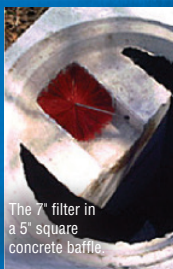
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### MAKING THE GRADE

#### Hillside Installing

This month's cover feature, starring Jan Hancock of Envirotek Systems, talks about the challenges of installing onsite systems in the Ozarks hills. Go online to see more about the equipment Hancock relies on for those tough jobs. [onsiteinstaller.com/featured](http://onsiteinstaller.com/featured)

### TROUBLESHOOTING 101

#### Water-Use Issues

Expert Jim Anderson continues his troubleshooting tips with this article on communicating with the homeowner about water use and how and when to check for hydraulic overloading. [onsiteinstaller.com/featured](http://onsiteinstaller.com/featured)

### Overheard Online

"If you can make the numbers work, adding retirement savings to your benefits package will only bolster your company culture and your recruiting."

– *Should You Offer Your Employees Retirement Plans?*  
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### SHOWING OFF

#### Next-Level Skills

If you missed it, check out this video of a guy assembling a hot dog and building a little Lego truck with an excavator. It's pretty impressive. [onsiteinstaller.com/featured](http://onsiteinstaller.com/featured)



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▲ The Envirotek Systems team includes, from left, Danny Addison, Ryan Groeteke, Cheryl Hancock, Jon Hancock and Chrissy Groeteke. (Photos by Bruce E. Stidham)

# ONSITE IN THE OZARKS

Rustic terrain, miles and miles of waterfront properties bring design and execution challenges to experienced Missouri installers

By David Steinkraus

**F**rom the time he moved to the Ozarks, Jon Hancock found the wastewater business a productive one.

“We liked this part of the country. There’s beautiful scenery here, lots of lakes. I love to fish, even though I stay too busy with work. I don’t make enough time for fishing,” Hancock says.

Since he came to the Ozark towns of Branson and Nixa in southwestern Missouri, he built Envirotek Systems into a company that thrives on challenges. Now he is expanding into a new enterprise that promises to keep him away from that fishing boat for a while longer.

## BUILDING ON SERVICE

About 90 to 95 percent of Envirotek Systems’ business is repair and remediation work on wastewater systems. The rest is installations and inspections.

Hancock sees problems in both conventional systems and advanced treatment systems that he is called in to fix. He sees systems that are malfunctioning because of a combination of poor choices in design and installation as well as operation and maintenance. Poor choices probably stem from a lack of knowledge in installation and operation or determination to do a job well, he says.



“It could be someone not understanding or ignoring that a drainline needs to run downhill, not up and down. I see simple things like that overlooked during installations. I see lateral lines that run uphill instead of being level. How does that happen? I don’t know,” he says. “My working idea on that one is someone didn’t have experience with elevation equipment because grade stick measurements increase the higher you look on the stick. My idea is someone may have got the concept backward and thought he should read a lower number to get a falling elevation.”

He has seen a lack of compaction around pump stations or septic tank pipes settle and break. He sees electrical connections placed inside a pump chamber so they can be immersed by high water during a power failure. Or, a property changes hands, and the new owners are not familiar with the system and hire someone not familiar with the technology and how to maintain it.

Because of the number of lake lots he deals with, conventional septic tanks are not in the picture very often. For new systems, he will use something with advanced treatment such as the Bio-Microbics products. Troubled conventional systems in his area are commonly remediated with newer technology.

“We work in Arkansas a bit. I am licensed there, and I’m considering expanding farther than that. But right now, most of our work is in Missouri,” Hancock says.

The first company office was in Branson and still is, but after a time, Hancock opened a second office in Nixa, about 30 miles north of Branson and near the larger community of Springfield (population about 167,000).



## Envirotek Systems LLC

**Location:** Nixa, Missouri

**Owners:** Jon and Cheryl Hancock

**Founded:** 2014

**Employees:** 6

**Service area:** A 200-mile radius around Nixa

**Services:** Installation, repair and inspection of onsite systems

**Associations:** National Onsite Wastewater Recycling Association

**Website:** [www.enviroteksystems.com](http://www.enviroteksystems.com)

▼ Jon Hancock operates a JCB North America backhoe while preparing a hole for a new septic tank.





» Jon Hancock locates a camera head in a buried pipe with the help of a receiver/locator from Radiodetection.



Hancock was receiving many job requests from that area, and it was also close to the suppliers he uses for his new venture: building pumps and control systems.

### **DOING IT HIMSELF**

At least 50 percent of the service and repair work consists of building his own components.

“In 2017, we might have had a larger percentage because we did a big commercial project with our pump and controls systems,” Hancock says.

“I started building my own equipment because I wanted more reliability, functionality and flexibility in our systems. One of the big things was control over the pressure and flow of the system,” he says.

Some of the solutions he has come up with lie in his controls, some in his own designs for mechanical parts, and he doesn't want to say more because there are patents pending on his ideas. His equipment finds a place in the treatment and distribution portion of wastewater systems he installs.

This part of his business has grown to the point where Hancock has rented space for a research and development shop. Perhaps there will be a need for machinery expansion in the future as the shop grows into other space and does more building, but at the moment, it is intended to build and test pump and control systems for projects.

“One thing we're big on is trying to recreate, as much as we can, the exact conditions that we're going to experience in the field,” he says.





He started development of his own components about eight years ago. Through his work, he befriended an electrical engineer who serves as a mentor and provides important design, programming and integration services for his systems.

“Of course there was a learning curve for me involved in being able to build our own systems, and it took a while for me to get up to speed on that,” Hancock says.

He likes hands-on learning but is being pulled away from it.

“I think that’s what a lot of small-business guys suffer from. They start out liking to do something, whether it be dirt work or plumbing, and then they often struggle with increasing the volume of their business or expanding because they’re too involved in everyday aspects and are on job sites. I’m still on every job site, and I’m hoping that I’ll be changing that in the near future as I grow my staff,” he says.

▼ Envirotek Systems’ Jon Hancock uses a JCB North America backhoe to lower a Roth Global Plastics tank as Danny Addison guides it in from below.



**“I’m not too big on mediocrity. I would prefer to excel at something, and that’s the type of individual I’m looking for. ... Typically you find a person with one skill set and train them in others because guys who know dirt work and plumbing and electrical — they don’t just fall off trees.”**

**Jon Hancock**

**Mama always said...  
“It’s what’s on the  
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» Line location is performed by Jon Hancock using a Wopson sewer camera system.

In other words, he is looking for someone else to work for him — not that this search is an easy task.

## EQUIPMENT CORNER

Because Envirotek Systems has a specific niche, it maintains a small list of equipment. The company owns:

- A JCB North America model 214 backhoe from 1995. With this is a hydraulic rock breaker and a compactor.
- A 1996 compact track loader, model DL7000 made by ICC.
- A 1980 F2275 International truck tractor.
- A custom-built air-tilt and air suspension low-boy trailer (homemade). The air suspension was already installed when Hancock bought the trailer. Air tilts the bed, and because the suspension is air, there is no need to constantly replace springs or bushings.
- A Wopson brand model WPS712DKC sewer camera.
- An Amazing Machinery brand model AM400 sewer jetter.
- A Radiodetection locator/receiver.
- A 22-foot-long United Express Lines cargo trailer that houses all the pipe, fittings, camera, jetter and hand tools.
- Three Wacker Neuson tampers, two of the small jumping models and a walk-behind vibrating plate model for road crossings.
- A Northrock Industries concrete vibrator.

The concrete vibrator is useful for settling gravel used to bed poly tanks. Most poly tanks have ribs for strength, and when a tank is set, bedding material has to fill the void created by ribs under the tank, he says.



“So we were getting tired of pushing a short shovel in there to compact the small-diameter gravel we were using to fill in those voids, and I just happened to remember we had that concrete vibrator. And we can use it in tight quarters. You can take the point of that tool and shove it in cracks and crevices and get your compaction and also make your material flow to that area so it will fill up all the voids,” Hancock says.

He prefers poly tanks because he often works in tight quarters around lake homes where there is little room for big trucks and cranes. Because they’re so light, poly tanks are easy to maneuver into place. They can be set with the JCB North America backhoe. Connections are watertight, and there is no degradation of the tank by gases inside, he says. He likes to use Roth Global Plastics tanks.

continued »

## ATTRACTING WORKERS

As his business expands, Jon Hancock needs help at Envirotek Systems. He still works in the field on every job, but he feels a strong pull from the office and a pump and controls research and development shop. What he really needs is additional staff.

“I’m not too big on mediocrity. I would prefer to excel at something, and that’s the type of individual I’m looking for,” Hancock says. He wants an operator, laborer and technician for installation and service work, but such people are hard to find. Hancock says there is a shortage of qualified people based on the poor work he sees on wastewater systems he’s called in to fix.

“Typically you find a person with one skill set and train them in others because guys who know dirt work and plumbing and electrical — they don’t just fall off trees,” Hancock says. “I’ve noticed what may be a lack of passion in people in this line of work. They’re not passionate about learning.”

The exception is his dedicated staff and his wife, Cheryl, who are instrumental in the success of the business.

For the right person, there may be even more opportunity because at some point, Hancock will want to retire and pursue the fishing that he loves to do on the many lakes dotting the Ozark country where he lives. That right person may wind up getting the whole business.



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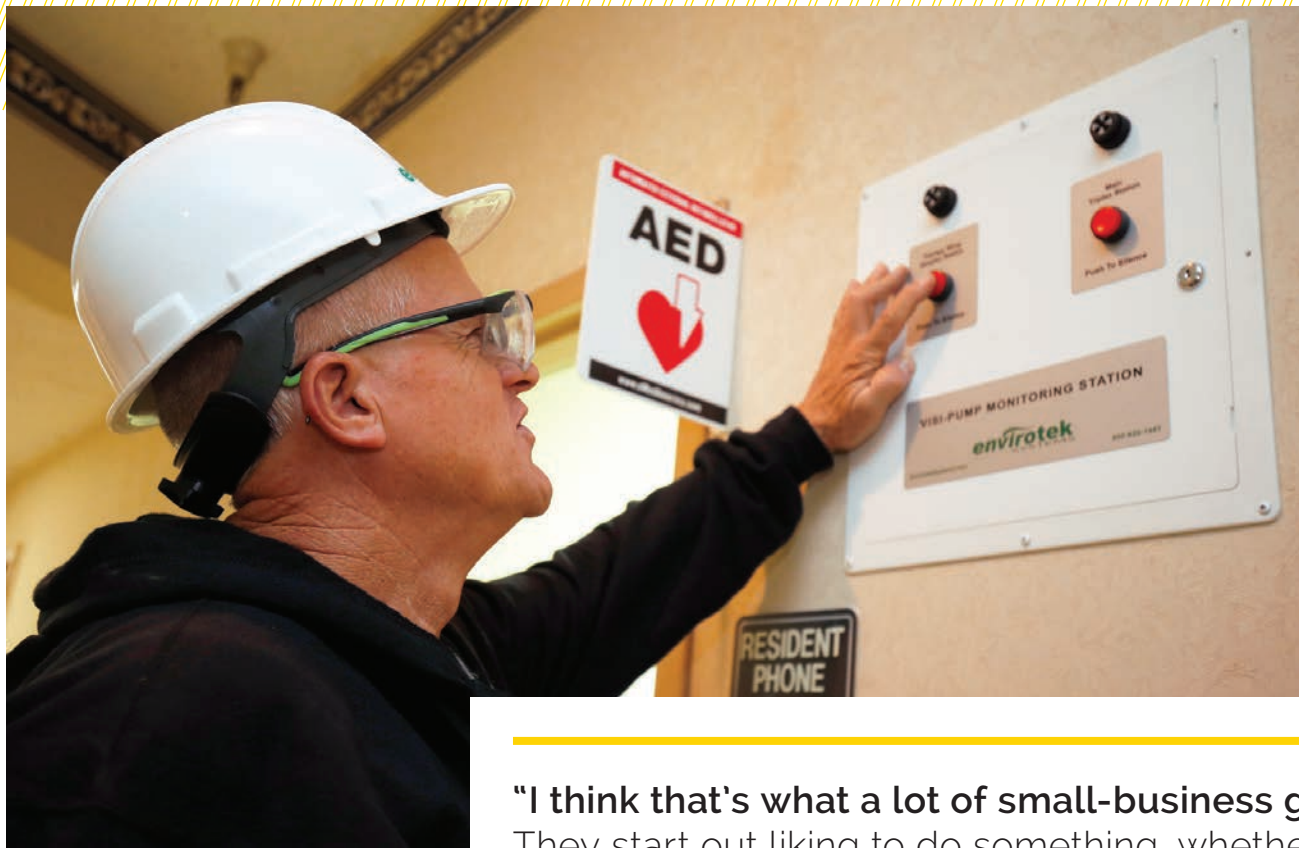
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◀◀ Jon Hancock checks the control panel he built for a tank alarm on a wastewater system at a nursing home in Anderson, Missouri.

## HANDLING THE MACHINES

Hancock has deep experience in dirt work. He grew up on a farm around Kansas City, worked primarily by his older brothers. His brother-in-law, who did custom farming, taught him to handle a tractor and a stick shift automobile. If there was a mechanical breakdown, Hancock could drive the 5 miles to town at age 9 and fetch parts. At age 10, he started in his dad's waterproofing business. His older brothers, David and Dennis, taught him to run heavy equipment while he was in high school and have been invaluable mentors throughout his career.

When he graduated from high school in 1975, he ran crews for his father for four years before starting his own business doing excavations for residential construction. Because it was a rural area, some clients began asking him to work on their septic systems. He had worked part time for a plumber while he was in high school, so he agreed.

In 1993, at the tail end of a boom, he moved to Branson where wastewater work was more plentiful and the country more pleasant.

"I got work from just returning a phone call," Hancock says. "Some people don't know this about the Ozarks, but the culture here is a bit different. It's not uncommon for someone to set a job appointment for a Tuesday but leave early because hunting season is open. One key to my success is showing up on time."

## ONLINE REFERRALS ARE KEY

He still has the Branson office and will keep it. Administrative work is done there along with consulting with clients, but what's more important is its recognizable name. Envirotek Systems also has a lot of contacts in that area, so it is not one to abandon. It is in the Nixa area where the growth is happening.

Hancock's daughter, Chrissy, has a degree in marketing and helps her father with that. He recently hired an outside internet marketing company,

**"I think that's what a lot of small-business guys suffer from. They start out liking to do something, whether it be dirt work or plumbing, and then they often struggle with increasing the volume of their business or expanding because they're too involved in everyday aspects and are on job sites."**

**Jon Hancock**

First Page Access, to manage the company website. They specialize in search engine rankings, and since hiring them, he has noticed a significant increase in calls and business. There are some word-of-mouth referrals, but the website is bringing in much more business, especially younger people in the Nixa-Springfield area. Retirees and second homes are common around Branson.

"I still provide content and information, but I hired First Page Access because they make sure no other business in my industry uses my copyrighted material and they know how to make my website effective online. And online is how business gets done now," Hancock says.

The website is split into two primary sections with content specific to each community. The Branson page talks about tank repair and installation with a section on the signs of a failing system. The Nixa pages include information about the company's pump systems and inspection service. The content is constantly updated, and there is also a blog covering broad industry topics.

## CHALLENGES ACCEPTED

"Interestingly enough, I've gotten some jobs in the Nixa area because a customer had a more challenging site and did an internet search around Branson. They assumed an installer from the Branson area might be faced with more challenging conditions because of the lakes," Hancock says.

Typically these clients are professional people who tend to do a lot of research on the internet.

"Our clientele is becoming more and more information-minded. And I've noticed that some of the clientele are beginning to realize that they need to look for a special individual or a special firm that really does know their



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business. Clients don't rely only on a license or certification," he says.

Hancock is pushing Envirotek Systems' expertise to make the company an obvious choice.

"I had a client make an interesting comment to me recently. He's an engineer — I think a civil engineer — and he said, 'I've had numerous people come out to look at this, and I've not yet found anybody who has instilled any confidence in me.' That guy was ready to sign up with me before I even showed up," Hancock recalls.

"I don't know where we're headed in our culture, but it seems that a lot of the younger generation once were of a mindset that they needed to get a degree in something and not necessarily learn a trade. I actually see the service industry evolving. I think it's getting to the point where for guys like myself, their trade will be valued more than it once was, and people will be paying rates to services like mine that they pay to doctors and lawyers. That may be stretching it a bit," he says.

For now, fishing will have to wait. Expansion of his business may give Hancock less time in a boat, but for the moment, he's having too much fun to worry about it. ■

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# A Granny Pod May Require More Than the Trendy New Structure in the Backyard

Proper sizing of components, study of the type of wastewater system in use are critical to the success of a tiny home aimed at caring for the elderly

By Jim Anderson and David Gustafson

Last month, we discussed potential impacts on septic system design and operation if an elderly family member in need of additional care moves into the existing household. Another caregiving scenario becoming more common involves a granny pod, where a separate small residence is placed in the backyard. These are essentially temporary tiny houses.

Depending on the health needs of the intended resident, these pods take the form on the inside of either a luxurious hotel suite or a well-equipped extended care suite complete with hospital bed, medical equipment and any other necessary features. Typically, the pods have one bedroom, a kitchen, and a living room, with a size of 400 to 500 square feet.

When the backyard is in an urban area served by municipal sewer, the granny pod is connected directly to the sewer line. When the backyard is in an area served by septic systems, handling the waste becomes more of an issue. The question is somewhat the same as moving into created living space in the home; but in this case, there is a detached small residence that probably deserves or, in a lot of areas, requires its own waste treatment system on the lot.

## ESTIMATED FLOW CHANGES

Obviously the first thing that needs to be checked is whether there is room for the granny pod and the necessary system on the lot as well as meeting all the setback requirements. Not every lot is going to be large enough.

Estimated daily sewage flow for such a residence under our state code would be 180 gallons per day. With this estimated flow, a 1,000-gallon septic tank would be required (since that is the minimum allowed by code). Some other codes we have seen allow 500-750 gallon capacity tanks to serve a one-bedroom residence.

The required soil treatment area depends on the soil conditions. For example, a loam soil would require about 400 square feet of trench bottom area to accommodate a flow of 180 gpd. This would be 133 lineal feet of 3-foot wide trench. This could be two 70-foot-long trenches installed 8 feet on center for a required area of about 600 square feet. As we indicated above, not every lot is going to have the area needed to accommodate a separate system. Where it makes sense or is necessary to use the existing system and add to it, effluent from the septic tank serving the pod can be connected by the supply line to the system.

Similarly, if grandma moves into a basement apartment where a bedroom is added, estimated sewage flow would increase by 150 gpd. Approximately 333 square feet of trench bottom area would be required or

When the resident is on numerous medications or chemotherapy, additional antibiotics, cleaning supplies and other chemicals may be introduced to the system.

**This will require continual monitoring and more frequent cleaning of septic tanks.**

111 lineal feet of 3-foot wide trench. In this case, the current system will need to be enlarged in both cases to accommodate the increased flow. Whether that can be accomplished depends on the soil conditions and the layout of the current system.

If the existing system has dropbox distribution, adding a trench assuming good soil conditions will be relatively easy. If the current system is a mound or at-grade system or trenches with pressure distribution, it becomes more difficult to add capacity. All parts of the distribution system will need to be reevaluated, redesigned and changed as necessary. Increased flow may require a larger pump tank and a larger pump may be needed to serve the larger pressure distribution system in addition to physically increasing the size of the soil treatment area.

## DEALING WITH MEDS

Some of the stories we've seen about granny pods make the point they have the same characteristics as a hospital room or extended care unit. When the resident is on numerous medications or chemotherapy, additional antibiotics, cleaning supplies and other chemicals may be introduced to the system. This will require continual monitoring and more frequent cleaning of septic tanks.

If an existing soil treatment unit is going to be used, timing of effluent flows from the two residences may suggest a time-dosed type of system makes sense. This is where the pump tank is sized large enough to hold flow from peak use times to be spread out during the entire 24-hour period. It is also a way to manage washing machine flows because there may be the need for



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increased usage due to elderly medical conditions such as incontinence. For pressure distribution systems (mounds, at-grades, pressure trenches), time dosing is a desired practice to meter out the flow during the day.

When using a pretreatment unit other than a septic tank, such as a media filter or ATU, checks will also be necessary to determine if they handle the increased flows. A larger system may be necessary or adding to the existing device, or even employing a different type of pretreatment.

The bottom line is that before the family decides to have grandma come and live with them, there are a number of factors concerning the septic system to be considered. Make sure there are no surprises lurking that cannot be fixed or managed. □

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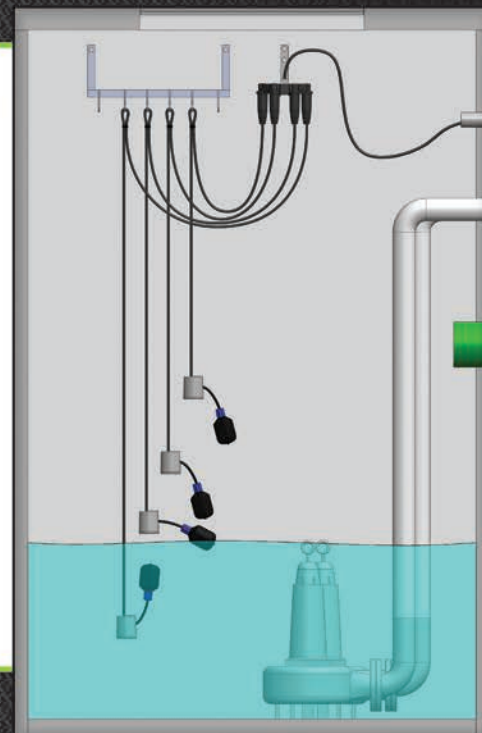
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# Florida Inspection Bill Is Watered Down; Jacksonville Reels From Septic Tragedy

By David Steinkraus

When a Florida legislator introduced a bill in early 2017 to require point-of-sale inspections, part of the justification for the bill was the contribution of septic tanks to poor water quality in the Indian River Lagoon along Florida's east coast. No one argues the water quality point, but there is reason to doubt how much septic tanks contribute.

In 2016, there was a massive algae bloom in the St. Lucie River at the southern end of the lagoon. Because of the bloom, St. Lucie County closed its beaches for the first time, manatees died, and the local tourism economy generally took a hit.

The lagoon starts at about the latitude of Orlando and stretches south for about 50 miles along the coast to Port St. Lucie. Experts agree the prime cause of the algae bloom was a discharge from Lake Okeechobee, which takes in fertilizer-rich water flowing off the vegetable farms that cover central Florida. Algae grew there and flowed downstream in rivers and streams until they collected in the lagoon.

The continuing question, reports the *TCPalm* newspapers, is whether nutrients leaking from septic tanks turned the algae bloom into what more than one news outlet described as a guacamole-like blanket that covers the water. The paper interviewed three scientists who had differing views.

Brian Lapointe at Florida Atlantic University says he took samples during the bloom and found algae were feeding. He maintains septic tank nutrients fed the bloom.

Edward J. Philips of the University of Florida says algae in the lagoon were dying and not feeding. Algae can be found at all depths in a lake, but when they reached the lagoon, they were stressed by the increased salinity, began dying, and floated to the top of the water. Instead of a bloom, the algae mass was concentrated by winds.

Edith Widder, founder and head of the Ocean Research & Conservation Association in Fort Pierce, says algae probably didn't feed on septic tank nutrients. Freshwater from the lake would have floated above the saltier water in the estuary, and that means any nutrients feeding the algae would have come with them in the freshwater from the lake, she says.

As to the Florida Legislature bill requiring septic inspections, it never went anywhere. A committee diluted the bill to require only that a property seller disclose the presence of an onsite system, and it also requires the state to build a database of all properties with onsite systems. That version passed the House, but it died in a state Senate committee.

In other Florida news, a state report suggests the city of Jacksonville

may have hired an improperly licensed contractor following the death of a 3-year-old boy who fell into a septic tank and drowned.

Amari Harley died on Oct. 22 after he fell into the tank in Bruce Park during a party. The city had received complaints about an uncovered tank in the park, and a girl told television station WJAX that she fell into the same tank about two months before Harley.

The TV station subsequently reported that the state Department of Health contacted Environmental Remediation Services, hired by the city to perform maintenance work, and was told the company did not have licensed people on staff. When the station asked the city about the state report, a spokesperson said the company is licensed to repair lift station pumps and dosing tank pumps and met the city's bid specifications.

An attorney for Harley's family says the city either did not do its due diligence or knew the contractor was not licensed and hired them anyway. She says the family plans to take legal action against the city.

## New York

In keeping with a push to control nitrogen in the waters of the Atlantic Ocean, Suffolk County is proposing a bill that would require homeowners to replace failing cesspools with a septic system.

Cesspools are widespread in the county, which covers the eastern end of Long Island and includes such wealthy communities as the Hamptons. Since 1973, the county has allowed homeowners to replace a failing cesspool with another cesspool, reports *Newsday*. County officials estimate that of 360,000 homes not on municipal sewer service, 252,000 have cesspools.

If approved, the bill would take effect in 2019 and would affect 5,000 to 9,000 homes each year. The bill would also require liquid waste haulers to report pumpouts to the county. Three or more pumpouts in a year would indicate a failed system. Deputy County Executive Peter Scully says county legislators will probably be asked this year to approve a bill requiring advanced treatment systems for new construction and as replacements for failing systems.

## Colorado

New regulations will give homeowners in three counties more wastewater system choices and require inspections at the time of property sale. The regulations were adopted by the San Juan Basin Public Health Board. It covers La Plata, San Juan and Archuleta counties in the southwestern corner of Colorado near the New Mexico border.



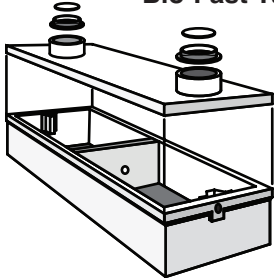
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Under the regulations, tiny homes (typically up to about 400 square feet) may have smaller wastewater systems than traditional homes. Homes using advanced treatment systems may have smaller systems with regular maintenance. Also, homeowners will be required to obtain permits if they intend to use any low-cost remediations on septic systems.

The rules took effect in January, but the point-of-sale inspection rule will not take effect until January 2019 to allow time to train inspectors, reports the *Durango Herald*. □

"Rules and Regs" is a monthly feature in *Onsite Installer*™. We welcome information about state or local regulations of potential broad interest to onsite contractors. Send ideas to [editor@onsiteinstaller.com](mailto:editor@onsiteinstaller.com).

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## SYSTEM PROFILE



◀ John Crandell and Tom Foster wire connections and begin backfilling the excavation. (Photos courtesy of John Crandell)

# Upgrades From Cesspools to Advanced Systems Begin on Long Island, New York

Installer John Crandell installs five nitrogen-removal Hydro-Action units in Suffolk County onsite pilot program

By David Steinkraus

**O**n the eastern end of New York's Long Island, Suffolk County is home to wealthy communities such as the Hamptons. It's also home to a large number of cesspools, which are blamed for a number of water-quality problems along the county's shoreline.

To address the problem, local officials have begun a campaign to replace cesspools as the only predominant means of wastewater treatment. In August 2017, the town of East Hampton became the first in the county to require low-nitrogen wastewater systems in all new construction and projects involving substantial renovation. The town also approved a rebate system that will give people money to replace older systems with those that reduce nitrogen to 19 mg/L, and these rebates can be paired with a similar rebate program adopted by the county.

## Pilot project

John Crandell, who owns A & A Sewer and Drain Maintenance, became involved in the nitrogen-removal effort through a county pilot program. What the county wanted to do was test various systems for their ability to remove nitrogen, Crandell says.

The county picked 19 homeowners to receive free systems donated by manufacturers and free service for five years, also donated by the manufacturers. Crandell worked with Joe Densieski of Wastewater Works, the local distributor for Hydro-Action systems, and Tom Foster of Eco Supply, the local dealer for Hydro-Action.

"So the three of us teamed up and put five Hydro-Action systems in on the island to start this project," Crandell says. "Suffolk County first approved





◀◀ The two Hydro-Action tanks go in the hole with Pete Sabo and John Crandell ready for the next step.

⚡ The only piece of earth-moving equipment needed for the job in Dix Hills, New York, was this John Deere 60D. It took care of all the digging and had enough power to set the two Hydro-Action tanks.

Hydro-Action in the spring of 2017, only five to six months before we did our installation.”

It was the first advanced system to be approved, and the county will be taking samples for tests, as will Hydro-Action in conjunction with Wastewater Works, to monitor how the system works under Long Island conditions. As Crandell understands the process, units will be monitored for a year, and then another 15 will be installed. Once 20 units are in the ground and meeting the county limit of 19 mg/L of nitrogen, the Hydro-Action units will be out of the provisional stage. The five units are averaging only 12 mg/L, Crandell reports.

### Step by step

The site for this installation was a four-bedroom, single-family home in the community of Dix Hills, just about in the middle of Long Island. Water from the community drains mostly toward Long Island Sound. The home chosen for the pilot installation sits on a lot of about a half acre, but the system had to fit between the home and a street. The plan also called for the existing 1,000-gallon concrete septic tank to be pumped out, cleaned and abandoned in place.

“That was required by the health department in the first pilot program. They want to make sure the new technologies work as expected before they authorize people to rip out the old systems,” Crandell says. If something went wrong, the old tanks could be quickly reconnected. But as the pilot project went on, county specialists saw the new technologies were working, so the next set of plans provide for removal of old tanks, he says.

### System details

From the wall of the house, wastewater leaves in a 4-inch, Schedule 35 PVC pipe and travels 10 to 12 feet to the first of two Hydro-Action tanks.



## System Profile

**Location:** Dix Hills, New York

**Facility served:** Single-family home

**Designer:** E.S. Kalogeras, P.E.

**Installer:** A & A Sewer and Drain Maintenance, Brooklyn, and Eco Supply, Calverton

**Type of system:** Hydro-Action AN550

**Site conditions:** Silty topsoil changing to sand and gravel

**Hydraulic capacity:** 550 gpd



## SYSTEM PROFILE



» The finished system awaits new grass to grow in.

“They (health department officials) want to make sure the new technologies work as expected **before they authorize people to rip out the old systems.**”

**John Crandell**

The first is 300 gallons and is for anaerobic treatment.

Wastewater then flows by gravity into an 836-gallon tank where air is introduced for aerobic digestion of organics. Air comes from a Hiblow USA HP-100 linear air compressor. At the bottom of this tank is a recirculation pump, a Zoeller Pump N264 nonclogging vortex impeller design with a 2-inch discharge.

Water returned to the first tank is introduced at the bottom. This induces a swirling motion in the tank to keep the solids from settling, Crandell says. For the first 30 days, a pump ran in the anaerobic tank, too. That was a Barnes SP33 (Crane Pumps & Systems) submersible effluent pump capable of handling 1/2-inch solids. Its only purpose was to produce an initial mix of the solids, and it won't be turned on again unless the system must be pumped down and restarted, he says.

Only 10 percent of the water is drawn out of the second tank for dispersal. That flows through a 4-inch, Schedule 35 PVC pipe into a cesspool about 12 feet from the tanks.

For these pilot projects, the cesspools are being reused, Crandell says. But, of course, the effluent flowing in now is cleaner.

The system is controlled by a custom control panel from Septic Products.

The only piece of equipment Crandell needed was a John Deere 60D mini-excavator. It did the digging and had enough power to set the tanks in the hole, he says.

All the tanks were fitted with risers and lids from Polylok Inc. / Zabel.

### No power, no problem

Because the wastewater flows through the unit by gravity, there is an advantage, Crandell says. If the power fails, the system will continue working as a gravity-fed conventional septic system. It won't aerate, but it also

won't back up into a home in the absence of power. And although the power grid seems to have improved lately, there have been frequent, long, and widespread outages on Long Island in the past, he says.

For systems that do not allow gravity flow in the event of a power loss, the county is requiring either an overflow pipe with a separate drainfield or a backup generator.

Because of the water quality problems, business will not be slowing down for Crandell and other installers anytime soon.

“Since the county started on this project and began the second phase of testing with the installation of more systems, I've been getting a lot of calls from people who want the Hydro-Action system,” Crandell says. □

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# No Such Thing as a Routine Service Call

In rural New Mexico, Jay Carroll has learned to expect the unexpected when inspecting, pumping or installing a septic system

Compiled by Betty Dageforde

*In States Snapshot, we visit with a member of a state, provincial or national trade association in the decentralized wastewater industry. This time we learn about a member of the Professional Onsite Wastewater Reuse Association of New Mexico.*



### Association involvement:

We have been a member of the Professional Onsite Wastewater Reuse Association of New Mexico for the last seven years. We are grateful for the organization and its professional leadership.

### Benefits of belonging to the association:

The ability to periodically gather with other professionals in our industry. I am always gratified by the fact that there is a sense of camaraderie among our members. While the Stool Bus provides a service to a primarily rural community with a plethora of conventional systems, I am always interested to get some schooling from other technicians who deal with advanced systems and technologies.

### Biggest issue facing your association right now:

Just as in every other industry — government! In the end, the customer is the most important person in the mix, and the business of wastewater

professionals is to provide a reliable service at an affordable price. The service professional carries the burden of providing that service while abiding by the sometimes-oppressive regulations.

### Our crew includes:

We are a family-owned and -operated company. My wife, Penny, handles paperwork and office functions. The primary truck and equipment operators are my son, Justin, and myself, but we are always accompanied by Agustin Contreras, Adrian Martinez or Jerry Hicks. In our remote area, we rarely travel alone. The distances are too great, and no call is routine.

### Typical day on the job:

When it rains, it pours. Our service area encompasses a large portion of rural western New Mexico, which is about a 10,000-square-mile range. We don't get a call every day, but when we do, it can be anything from a simple pumping to an emergency repair, inspection, installation, drain cleaning or a request for a portable restroom. Adding to the challenge of providing the wide range of services, we might travel 70 miles one-way to perform a given task.

### Helping hands - Indispensable crew member:

Our MVP is, without a doubt, my wife and life partner of 42 years, Penny. She keeps us on track with all of the calls, inquiries, scheduling, permits and jobs. Her impeccable attention to detail and timely reminders are invaluable.

### The job I'll never forget:

"Unacceptable and deadly" comes to mind immediately. We were called to do an inspection on an old ranch property, which was under contract to be sold. Naturally, no one could tell us the location of the septic tank, as is so often the case. (A former employee) and I arrived and began to probe in the areas where we suspected the system might be located. We found a spot that seemed worthy of further investigation. While I went to unload the excavator, Corey continued with a little shovel work. When I returned five minutes later, he had opened up a small hole that was completely open beneath. I plunged the bucket of the excavator through the opening and a 5-foot-diameter area suddenly gave way, exposing an 8-foot-high culvert filled with "goo." As it turned out, the homemade "system" had been covered with a layer of rough-sawn lumber and a few inches of New Mexico dirt, decades ago. The sweet spot we had discovered, to begin our excavation,



was dead in the center of the 5-foot diameter area where 15 minutes earlier our combined 450 pounds was supported by a mere 4-inch layer of New Mexico soil, laced with grass roots. To this day, I still get a cold chill that runs up my spine when I recall that inspection. No call is routine!

### **Most challenging site I've worked on:**

We started the company on a shoestring budget. And while we've seen our share of job site challenges, the most challenging obstacle we have overcome is that we built our first truck with an old, 1,200-gallon water tank and a piston and diaphragm trash pump. It was a sight. ... But it worked. And after a year of making do with what we had, Penny came to me and said, "Babe, that thing is making money."

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

"How could my septic tank be full? It's only been three years." I'm always amused at the general lack of understanding that some people have with regard to how a septic system works.

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

In certain cases, a more liberal interpretation of codes and regulations should be applied. I understand that the rules are the rules, but there are certain situations where a commonsense variance might apply. For instance, the gallons per day design flow rate for a small seasonal RV park versus one that has continuous year-round occupancy.

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

"You have to learn to say no." I'm still working on this one. I hate to turn down work. But the necessity to balance quality production, maintain one's sanity, and achieve customer satisfaction is essential. You can't be all things to all people, but you can try.

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

Be doing construction, which is what we do when we're not doing septic-related work — though I prefer the septic business to construction these days. People call with a need, and we show up, solve their problem, get paid, and move on to the next call. □

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

Send your suggestions to Jim Kneiszal at [editor@onsiteinstaller.com](mailto:editor@onsiteinstaller.com).

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# 5 Steps For Better Routine Equipment Maintenance

Follow key service intervals, investigate and correct minor problems before they become major headaches

By Brenda Silva

In the daily management of construction equipment and job site priorities, busy installing contractors risk having preventive maintenance of vehicles and equipment fall by the wayside. To reduce those risks, contractors are encouraged to establish a preventive maintenance program and educate staff on how to follow it. When maintenance becomes everyone's responsibility, there is less chance for routine maintenance to be neglected.

Aside from routine oil changes and tire checks, several additional maintenance tasks should be at the top of every to-do list. This includes many items that have the potential to decrease productivity and increase costs, ultimately affecting much more than just your vehicle fleet.

Well-maintained vehicles and equipment will help your machines last longer, provide more reliable service, and pay you back when it's time to sell. And more importantly, properly functioning equipment will protect your crew, according to Leighann Follis, marketing specialist at Geneva Equipment of La Salle, Illinois.

"Vehicles in good operating condition also reduce the likelihood of operator injuries due to faulty equipment," she says. "On the other hand, poor maintenance results in employee downtime, untimely project completion, lost wages, and increased operating costs."

According to industry professionals, the following five tips can keep contractors moving in the right direction:

## 1. Create and follow a preventive maintenance program

By creating a preventive maintenance program for your support vehicles and having all employees adhere to it, performing maintenance quickly becomes second nature to everyone. Maintenance program templates are available online for contractors to download, copy, or duplicate; however, some contractors prefer to make their own. With a clearly defined and explained program, there's no reason support vehicles can't receive the same attention as job-specific heavy machinery. Getting into a new habit can play a crucial role in increasing the life of the vehicles and the project bottom line.

## 2. Train your employees to help spot potential problems

All employees should be trained to spot the signs of trouble long before they occur and become much more costly to the job duration and profits. Follis points out the importance of a five-point inspection for all support vehicles and equipment.

"Our staff thoroughly examines the interior and exterior of all vehicles and equipment, specifically looking for signs of damage," Follis says. "This includes checking for any bare wires that may be exposed and that all connectors are intact and not corroded or damaged. We also inspect all brakes, belts, hoses and shifters to ensure they are in good working order. It's also important to check for any front-end maintenance, transmission flushes and to check all fluid levels."

◀ REM Directional workers perform maintenance on a fleet truck. Beyond the routine oil changes and tire checks, additional maintenance tasks should be at the top of every to-do list. (Photo of Meggan Haller)





**“It is always advisable to follow all manufacturer recommendations**

because they are put in place by those who know the vehicle and/or equipment best.”

**Leighann Follis**

Protect electrical wiring from pooled rainwater and melting snow and ice that can end up inside machinery during long periods of field operation. Ongoing exposure can ultimately shorten the life of the equipment.

### 3. Pay close attention to fluid levels

Ensure vehicles and equipment have the proper fluid levels and lubrication to guarantee high performance. While contractors realize fluid levels are vital to machine life, this is a commonly overlooked aspect of regular maintenance. Noticed too late, improper or inadequate fluid levels can lead to faster wear and damage along with a shortened equipment life span. Fluids should be checked and sampled regularly as part of a scheduled preventive maintenance program — adjusted whenever necessary and documented — for optimal operation.

### 4. Follow factory-recommended maintenance scheduling

Follis urges contractors to pay close attention to maintenance scheduling and says, “It is always advisable to follow all manufacturer recommendations because they are put in place by those who know the vehicle and/or equipment best.” It’s a good idea to place stickers on equipment that need maintenance at certain intervals as a constant reminder to schedule service. In addition, contractors should keep original owner’s manuals for equipment as a reference of service-related conditions that can void a warranty.

### 5. Keep detailed records from the time of purchase

Keeping detailed service records cannot be stressed enough. These records serve as the vehicle or equipment’s personal history after purchase and provide new employees or second owners with important information about what is due for service at any given time. Good recordkeeping can add value at resale and is key to maintaining and extending the life of your vehicles and equipment. ▣



▲ Pro Serve’s Daniel Vicknair performs maintenance on a truck in the company’s fleet in Prairieville, Louisiana. Fluids should be checked and sampled regularly as part of a scheduled preventive maintenance program. (Photo by John Ballance)

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An advertisement for Septic Products Inc. It features a blue circular call-to-action bubble on the left that says "Call Today 419-282-5933". The main image shows several grey electrical control panels with their covers removed, revealing internal wiring and components. Above the panels, there are two float switches: one yellow and one black. The background is a light blue gradient with a splash of water. In the bottom right corner, there is a small cartoon green frog character.

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# Pumps

By Craig Mandli

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### Vertiflo Pump 1400 horizontal end suction pump

The Vertiflo Pump 1400 horizontal end suction pump has a heavy-duty, cast-iron frame that incorporates integrally cast support and ribbed mounting feet, which the maker says assures a solid, dependable pump installation and operation. One frame fits all pump sizes. The frame has a back-pullout design that allows for easy inspection or service/maintenance without disturbing the piping to the pump. It offers ease of maintenance with external impeller adjustment. Its semiopen impeller design accommodates passage of solids or fines. Wiping vanes reduce axial loading and prevent dirt from entering the sealing area. Packing or various mechanical seal arrangements are available. It is offered in cast iron, 316 stainless steel fitted, all 316 stainless steel, or CD4MCu. Capacities range up to 3,600 gpm, with heads of 275 feet and temperatures of 250 degrees F. 513-530-0888; [www.vertiflopump.com](http://www.vertiflopump.com).





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The AGP-HC200 grinder pump from Ashland Pump has a radial portion that grinds waste into fine slurry as well as a cutting-edge axial portion that cuts and chops stringy solids and other forms of nonhuman waste into pieces small enough to pass through the small-diameter discharge pipe. Fibrous materials get chopped and cut, while the soft solids become slurry, minimizing downstream solids and preventing clogging. The engineered design prevents wrapping at the inlet. The cutters are made of case-hardened 440 stainless steel and are easy to sharpen and adjust clearances, according to the maker. 855-281-6830; [www.ashlandpump.com](http://www.ashlandpump.com).



### Liberty Pumps ProVore

The ProVore grinder pump from Liberty Pumps is designed for residential applications where bathroom or other fixtures located below sewer lines require pumping. It features the same V-Slice cutter technology utilized in Omnivore Series 2 hp grinder pumps. Powered by a 1 hp motor, it is designed to operate on a standard 115- or 230-volt circuit requiring a 20-amp breaker. No special wiring is needed. Compact factory-assembled systems are available in both simplex and duplex versions. 800-543-2550; [www.libertypumps.com](http://www.libertypumps.com).



## SEWAGE PUMPS

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### Franklin Electric FPS PowerSewer System

The FPS PowerSewer System from Franklin Electric is available in 60-, 72-, 84-, and 96-inch basin sizes and pumps wastewater to a collection or treatment area, making it an alternative to gravity sewer systems and septic tanks. The basin's internal C-channel assembly releases from the top of the unit, simplifying accessibility to and maintenance of its components. The design of the tank provides for easy access and replacement of all other internal components. The float tree is spring-loaded and easily removable, with a lift handle to simplify pump removal. It has an isolated pump support that can accommodate heavier pumps for expanded applications. This provides added installation flexibility through compatibility with the entire line of Franklin Electric FPS 2 hp grinder pumps as well as any single-phase, three-phase, manual or automatic version of Franklin Electric's high head grinder pumps. 260-824-2900; [www.franklinengineered.com](http://www.franklinengineered.com).



### Webtrol Pumps MVPS-RE1

The MVPS-RE1 drop-in package for existing progressive cavity systems from Webtrol Pumps has a progressive cavity pump at its center, which provides reliable operation and nearly constant flow, and is easily able to adjust for pressure variations in any system setting, according to the maker. The package is powered by a 1 1/2 hp motor, spinning at 1,750 rpm to provide grinding torque. With all package parts readily available and easily replaceable, it can quickly and easily be serviced in the field. 800-769-7867; [www.webtrol.com](http://www.webtrol.com).



## PUMP CONTROLS

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The Model 197 control panel from Jet Inc. monitors the operation of the Jet Inc. treatment system aerator and additional components. It can monitor single- or dual-aeration systems with selectable high- and low-amperage monitor settings. The panels have dedicated alarm and control circuits with separate power circuits for aeration devices. In addition to the aerator control circuits, the panel contains three auxiliary 120-volt output circuits for external device control relays. They include three low-voltage auxiliary input circuits selectable for N/O or N/C alarm inputs. An integrated pump power control relay is automatically disabled in an auxiliary device alarm condition. A signal array includes a power indicator LED and four additional equipment alarm indicator LEDs. 800-321-6960; [www.jetincorp.com](http://www.jetincorp.com).





## PRODUCT FOCUS



### See Water Hydra Transducer Panel

Hydra Transducer Panels from See Water are a complete line of simplex, duplex and triplex control panels with a versatile HMI touch-screen controller. The transducer pump control panels come standard with a stainless steel enclosure and a programmable monitoring controller that displays the tank level and

pump status. 888-733-9283; [www.seewaterinc.com](http://www.seewaterinc.com).

### Septic Products 50B019-120-240DD


The 50B019-120-240DD control panel from Septic Products is a duplex time-dosing panel for use in residential or commercial applications. It can be used with 120- or 240-volt incoming power, and it accommodates two dosing pumps controlled by a repeat cycle timer. It has a durable, weather-resistant, NEMA 4X polycarbonate enclosure with SST latches; large, easy-to-access terminal block; circuit breakers for the pumps and control circuits; a rugged, externally mounted, UV-resistant alarm light; audible alarm and run-mute-test switch with UV-resistant sealing boot; definite purpose motor contactors; alternating relay; and pump hand-off-auto switches. Compressor hookups are available. Wiring schematic and detailed connection diagrams are



provided for the installer, as well as mounting feet for the enclosure. It is UL listed. 419-282-5933; [www.septicproducts.com](http://www.septicproducts.com).

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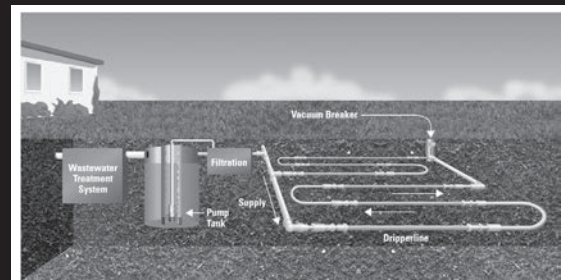


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www.arkowa.com

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www.cpow.net; 720/626-8989

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860/267-1057

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## FLORIDA

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## GEORGIA

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www.georgiafog.com

## IDAHO

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www.owaidaho.org;  
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North Carolina Portable Toilet Group;  
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North Carolina Pumper Group;  
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Pennsylvania Association of Sewage Enforcement Officers;  
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Pennsylvania Onsite Wastewater Recycling Association;  
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Virginia Onsite Wastewater Recycling Association;  
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**WASHINGTON**

Washington On-Site Sewage Association;  
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**WISCONSIN**

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**NATIONAL**

Water Environment Federation;  
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## PRODUCT NEWS

### Water Cannon Inc. - MWBE wet sandblasting kit

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## INDUSTRY NEWS



### Infiltrator Water Technologies works with Habitat for Humanity

Members of the Infiltrator Water Technologies team joined Habitat for Humanity of Eastern Connecticut to help in the early renovation stages of a four-bedroom home in Montville, Connecticut. A septic system was also installed by Norman Wood Excavating using donated products from Infiltrator Water Technologies' line of onsite wastewater products.

### Bio-Microbics wins i-NOVO award

Bio-Microbics announced it won the DirectIndustry 2017 i-NOVO award for its BioBarrier GWMBR Greywater Treatment System. It was voted most innovative in the i-NOVO Eco category by a three-step voting process. The Eco award is given to products that lessen or eliminate impact on the environment.

### Deere and Co. completes acquisition of the Wirtgen Group

Deere and Co. completed the acquisition of the Wirtgen Group, a privately held manufacturer of road construction equipment. The Wirtgen Group has 8,200 employees worldwide and sells products in more than 100 countries through a network of dealers.

### JCB North America's dealer network expands

Westcon JCB, headquartered in Regina, Saskatchewan, is the newest addition to JCB North America's growing North American dealer network. The new dealer will sell, rent and service JCB equipment from branches in Regina and Saskatoon, Saskatchewan, and in Winnipeg, Manitoba. □

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