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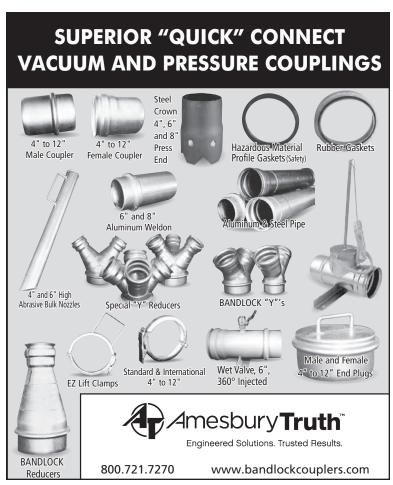
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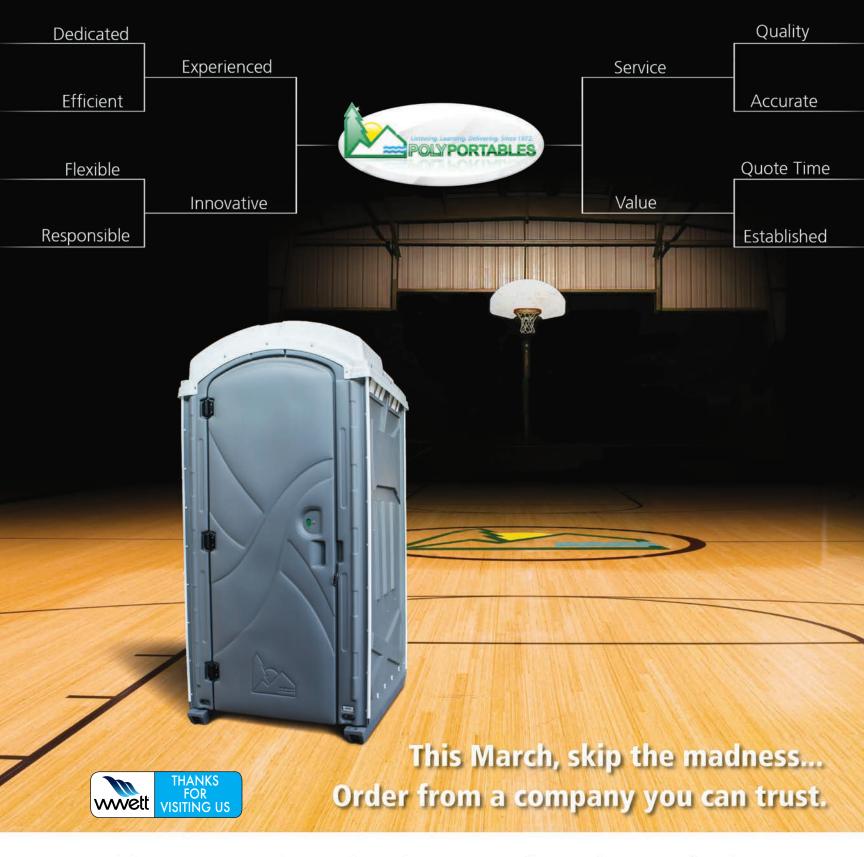
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Contact Jim with your comments, questions and opinions at editor@pumper.com.

Sending a Big Thank-You to Onsite Educators

The septic service industry should recognize the inspectors, regulators and public health professionals who constantly promote routine pumping and maintenance. By Jim Kneiszel, Editor

read a story from a small Missouri newspaper recently that illustrated just how uneducated homeowners can be about septic system maintenance. And it gave me a big idea.

The writer in the *Boone County Connection,* Lelslie Limberg, was explaining how a power outage forced her to get her septic tank pumped for the first time after 16 years of home ownership. Later, when she found out she should have her tank pumped regularly, her response was succinct: "Oops."

Limberg learned her aerator was nonfunctioning and "to make matters worse, the filter was jammed (Filters need regular cleaning, right?) Gross. Who knew? No one said anything about this when we bought the house.

"Is everybody else up on their septic tanks?"

You know the answer to that question: No way. Wish they were.

This is just another random story showing the dire need for consumer

education about the need for regular pumping and septic system maintenance in general.

THE WASTEWATER GURU

The writer turned to her county's "formidable, all-knowing wastewater guru," Sandy May. For 25 years, May has served as wastewater system inspection specialist for St. Charles County, Missouri, where she oversees 7,000 onsite systems. May quickly shared a list of 12 tips to avoid septic system failure, including "pump your tank every two to three years and every year if you have an alternative-type system."

Problem solved.

This is where my idea comes in. We as the industry should give an award every year to a

strong advocate for better public education about septic system care. We need to recognize those hardworking folks who act as a conduit between the uninformed homeowner and the professional pumper; the people who recognize when a consumer is lacking the basic knowledge about their septic system and sets them on the right path.

Sandy May

And I would nominate Sandy May as the first honoree.

I can't imagine how many homeowners May has helped in her inspection career. And every time she educates a homeowner, a system designer, an engineer or a Realtor, she's helping the pumpers in her region. May recognizes that the pumpers often bear the brunt of the criticism when they're called out to address a neglected system.

"They wait until it breaks and then they start pointing fingers at every-body, and everybody is at fault but them. It's amazing," May says of homeowners, especially those who are living in their first home with an onsite system. "Then you ask if they knew three toilets in their house were running for 30 days."

SPREADING THE WORD

When she started working in the Division of Building Code Enforcement, May quickly noticed an education gap among septic system users, Realtors, and even the professional engineers who were designing systems.

She meets with people having systems installed at new homes and finds out if they've ever lived off the public sewer grid. She patiently explains how their water-use habits will have to change moving off the sewer. She gives them the checklist and suggests they follow all of the recommendations.

"Once you get a feel for (who's used a septic system before) you know which ones you have to work with ... then I go to town," she says. She sends them the tips list, a soil report to keep on file, and provides lists of licensed installers and pumpers when that's requested.

As someone who can design systems in suitable soils and has learned the lay of the land in her part of Missouri, she focuses on working closely with engineers on all of the practical issues learned over the years working with installers and pumpers on the front line of maintenance. May's father and son are both engineers and she respects the profession, but she also says it's unfortunate there is no statewide training about onsite work for engineers.

"A lot of times they're not going to the site," she says in regard to a burgeoning business in new systems of late. "They draw stuff so pretty, it looks so nice on paper. Then when they get out there it's different. The ground doesn't lay like they show it on the plan. They're designing at their desk. If they'd have gone out there, they'd see that."

And Realtors get special attention as well. May organizes septic seminars for real estate agents 10-15 times per year, attended by 20 to 80 people each. She says 90 percent of the Realtors are concerned about the septic systems, while "others don't care. They're just going to sell." While her county code doesn't mandate pumping or real estate inspections, she's always pushing to improve oversight.

(continued)

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"I'd like to get into the real estate agents' pockets, and then they'd decide real estate inspections are a good idea," she concludes.

GLIMMER OF HOPE

There's good and bad when you're pushing education, May says.

"The idea is to get people interested and involved in maintaining their systems," May says. "I think we don't do enough training. I try to call on homeowners, discuss systems on the front end and explain as much as I can. But people, once they flush, it goes bye-bye and they don't care."

Well, that's not entirely true, May admits. She had a recent experience that gives her hope.

May remembers giving her pitch to a woman building a new home in the early 1990s shortly after she started working for the county. She caught up with the homeowner recently as she was selling the same house. There were no problems with her onsite system after all the years.

"She did everything I told her, and when it came time to sell that house, it passed a septic inspection, didn't need the tank pumped, the aerator re-

'Since I did every never had a proble and then they start pointing fingers at everybody and everybody is at fault but them ... Then you ask if they knew 'Since I did every never had a proble Another ho May out to than shooter and an Ime, 'You're not to get into someone me'. After all these pretty good."

Sandy May

three toilets in their

house were running

for 30 days. ""

placed or the filter cleaned. She told me, 'Since I did everything you told me to do, I've never had a problem with the system."

Another homeowner recently called May out to thank her for being a straight shooter and an honest evaluator. "He told me, 'You're not the good old boy trying to get into someone's pocket. You're out to help me.' After all these years, that made me feel pretty good."

DOING GOOD WORK

Quietly going about her business, May is making a difference for the pumpers in her county. Homeowner by homeowner, she's working to prevent premature system failure and show the value of calling a pumping professional for routine service. Without her

efforts, there would be more blame thrown to wastewater contractors and doubts about the effectiveness of decentralized wastewater in general. For that we owe her and others like her a debt of gratitude.

So what should the wastewater educator's award be? How about a plaque with a golden vacuum truck? \blacksquare





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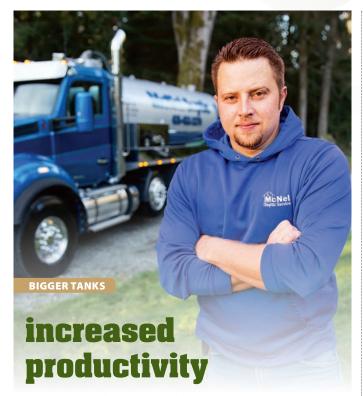
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For the first five years after he purchased McNel Septic, Shawn Carlton relied on a 1995 International truck with a 2,300-gallon tank. It was a reliable vacuum rig, but he had visions of bigger things. That dream became a reality this year when he took delivery of a 2016 Kenworth T880 with a 4,000-gallon steel tank outfitted by Erickson Tank & Pump and increased his productivity as a result.

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NEW vs. USED

get behind the wheel

Brad LaVoy, owner of Brad's Septic & Sewer Service of Temperance, Mich., knew exactly what he wanted when he ordered his new 2016 International 7500 vacuum truck. After driving used rigs for more than 20 years, he says the difference is significant. Read his story in this month's Classy Conversation, a companion piece to Pumper's Classy Trucks.

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With everyone relying on you to make the right choices for the business, big decisions like buying a truck can feel stressful. To add to that frustration, financing is shrouded by misconceptions. To make your decision a little easier, take a look at the most common equipment financing myths.

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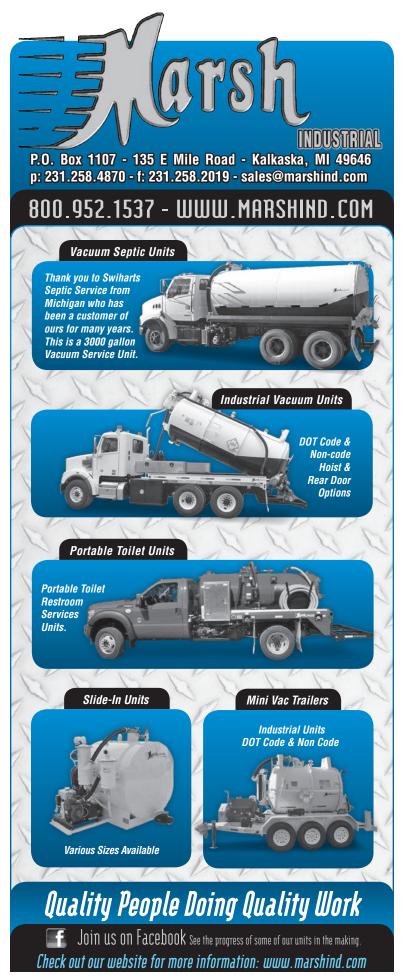


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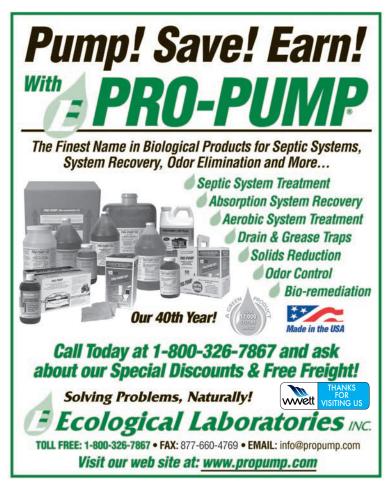
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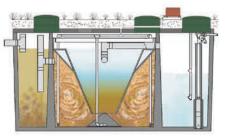
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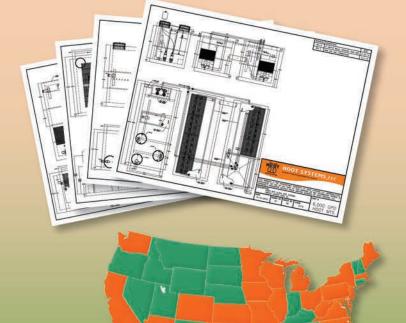
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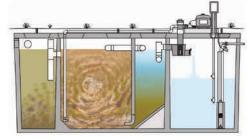




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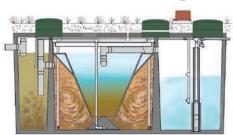
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COVER STORY In the aftermath of the fire at Clean Delaware, you can see this truck, barely recognizable, with its burned out cab and melted vacuum tank.

Clean Delaware returns stronger than ever after a devastating fire takes out its vacuum trucks, restroom inventory and facilities

By Peter Kenter

RISING FROM THE ASIA ES

erry Desmond recalls exactly where he left a shipment of decals designated for portable restrooms the night of a fire that ravaged the premises of Clean Delaware in Milton, Delaware. "We'd received enough decals to cover 100 portable restrooms," says Desmond, the company's general manager. "I left them on the seat of one of the trucks Thursday night. That's the last time I saw the shop before it was destroyed."

Desmond believes the fire started shortly after 6 a.m. on Jan. 9, 2015. "One of my employees who lives nearby called me to say that there was a fire," he says. "On the way over I heard a giant 'whuff' and saw a fireball 200 feet tall — that was the propane tank exploding."

Nine fire companies battled the blaze and brought it under control by 9:30 a.m. The fire had consumed the entire shop, 11 vacuum trucks parked inside and 175 portable restrooms located around the propane tank. Also gone: pumps, timers, controls, fittings and other inventory. The company's onsite wastewater treatment plant was also significantly damaged. (continued)

Profile

Clean Delaware Inc.

Milton, Delaware

GENERAL MANAGER: Gerry Desmond

FOUNDED: 1984

EMPLOYEES: 30

SERVICE AREA: Sussex and Kent counties

SERVICES: Septic pumping, installation,

repair and inspection; restaurant grease trap service, industrial and municipal pumping; portable sanitation

AFFILIATIONS: Portable Sanitation Association International,

National Onsite Wastewater Recycling Association, Delaware Onsite Wastewater Recycling Association

WEBSITE: www.cleandelaware.com







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RESTORING SERVICE

"After the fire, all that was left of a Kenworth truck with a 5,000-gallon aluminum tank was an engine block and frame — not even a steering wheel," Desmond recalls. "Some of the guys tried to recover their favorite hooks from the ashes, but few succeeded."

The folks at Clean Delaware made a decision to survive that day.

Launched in 1984, the business has prospered serving Sussex and Kent counties, and now employs 30 people. The company divides its time between three primary pursuits:

- Commercial and municipal pumping represents 60 percent of business. Clients include agricultural operations and food processing plants, breweries and municipalities requiring removal of biosolids and treated sludge.
- Septic tank pumping, installation and repair represents 25 percent of the work. About half the installations are advanced treatment systems with associated operations and maintenance contracts required by state law.
- Portable sanitation service for 800 restrooms represents the remainder of the work.

Clean Delaware was first profiled in Pumper 10 years ago as a pumping company celebrating its 25th anniversary. The magazine returned to check out how a small business comes back after a devastating fire.



Above: Technician Chad Jones cleans debris from the tank of a 2014 Kenworth with a 4,200-gallon Presvac tank with NVE blower pump.

Right: Chad Jones, left, and Joey Everitt open the rear hatch of the Kenworth. This truck was ordered before a fire that destroyed Clean Delaware's fleet and was delivered afterward.

KEEP CREWS BUSY

Desmond's two immediate priorities in the aftermath of the devastation: keeping his workers busy and servicing as many customers as possible. While the local office was destroyed, the company's head office is located offsite and provided continuity.

"A lot of our crew has been with us 10 years or more," says Desmond.

"There were more than a few tears as they wondered if they had jobs to go back to. We immediately began to find things for them to do, like taking stock of surviving equipment."

Only two vacuum trucks parked away from the shop survived: a 2007 Kenworth T800 pulling a 7,000-gallon aluminum tank trailer by Polar with a Masport pump, and a 1991 Freightliner FLD120 pulling a 5,500-gallon stainless steel tank trailer from Presvac Systems.

"That was good news because we still had some pumping capacity," says Desmond. "The bad news was that it's not easy to drive a tractor trailer to a customer's house There were more than a few tears as (employees) wondered if they had jobs to go back to. We immediately began to find things for them to do, like taking stock of surviving equipment.

GERRY DESMOND

to pump their septic system. But the most important thing was to keep our people working."

Desmond secured an office trailer and ordered electrical and telephone hookups and a new coffee machine.

(continued)



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Turning a profit with restrooms

Clean Delaware operates a thriving portable restroom business.

The company fields almost 800 units: 500 K2s from Five Peaks, and 250 Fleets and 30 Comfort XL from PolyJohn Enterprises. They're primarily delivered on a 12-unit trailer from Liquid Waste Industries. Two event trailers are from Black Tie Products — two-stall units, one ADA compliant. Deodorants are from Walex.

"Construction provides the bulk of our contracts," says Gerry Desmond, general manager. "We've got a nice construction boom going in Delaware."

The company once sought out contracts to service the largest events in the state, including the Punkin Chunkin World Championship, a pumpkin-throwing event held in Millsboro, which drew almost 50,000 people and required 200 restrooms.

"We found that on larger events like these, we were seeing damage to our units — portables with burn marks, tipped over and run over by trucks," says Desmond. "After crunching the numbers, and discounting repairs and maintenance, we realized that we weren't netting enough money from these events. We decided we would be better off focusing on smaller, controlled events and supplying nicer units. Today, we love doing events like farm festivals or road races where we can put out fewer but nicer units, maybe 20 to 40 with sinks and freshwater supplied with foot-activated pumps. For us, that's the sweet spot."

Vacuum Sales in Lindenwold, New Jersey, also rushed a trade-in truck off the lot, which was ready to use by Friday evening.

"We called our operator network to find out if there were any new pumpers available," says Desmond. "Lane's Mobile John in Ken-

tucky had three Dodge 5500s coming off the line. Generally nobody sells you a truck without a two- to three-month lead time, but we flew three guys out to Kentucky and they drove them back."

A Kenworth T-800

is used to haul yeast byproducts from a brewery

in Milton, Delaware.

running in tandem with a

7,000-gallon Polar tanker

The company had also been interested in buying the assets of another pumping company — the deal was closed in a day. Desmond recalls painting the company logo onto that truck.

"That really boosted morale," he says. "We had our identity back."

DOING MORE WITH LESS

While Clean Delaware's pumper fleet featured tanks with an average

4,200-gallon capacity, the replacement fleet initially averaged closer to 2,000 gallons, requiring the crew to drive longer hours to cover the same ground.

"We had a brutally cold winter, so with pumpers parked outside instead of inside, we were dealing with frozen valves and lines," says Desmond. "Everything took longer. It was a perfect storm of bad events."

The cause of the fire was never determined. However, a replacement 60- by 90-foot building was erected by November. Insurance fully covered the replacement costs of the building, although vehicles were compensated at depreciated value, requiring Clean Delaware to commit additional capital to replace vehicles. While major inventory over \$2,000 was covered for insurance purposes, Desmond notes that replacing smaller tools remains an ongoing effort.

"Not a week goes by without someone asking where they can find the 'doohickey' machine," he says.

Today, the fleet is fully built out. The company's six commercial vacuum trucks include three Internationals — a 2001 8100 with a 3,300-gallon steel tank and Jurop/Chandler pump; a 2003 4900 with a 3,600-gallon Progress aluminum tank and Wittig pump (Gardner Denver); and a 2013 7600 with 4,800-gallon Progress aluminum tank and Masport pump. The remain-

ing trucks all have pumps by National Vacuum Equipment: a 1999 Sterling with 3,400-gallon steel tank; a 2014 Kenworth T440 with 4,200-gallon Presvac aluminum tank; a 2014 Freightliner

Eric Luciano checks out a control panel for the company's Lakeside Raptor septage acceptance plant.

(continued)







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M2 106 with 4,000-gallon Amthor International aluminum tank; and a 2015 Western Star 4700 with 4,000-gallon aluminum Amthor tank.

Dan Cleary performs a residential septic system inspection.

A Lakeside Raptor septage acceptance plant assists in processing waste for the company's on-site waste processing facility.

The portable sanitation fleet includes five trucks, all with Masport pumps: three Dodge 550s with 950-gallon waste/300-gallon freshwater tanks, two steel and one aluminum, from Lane's Vacuum Tank; and two Isuzu NRR trucks from Crescent Tank with 750-gallon waste/350-gallon freshwater steel tanks that carry six portable restrooms.

Of five shop trucks, four have utility bodies — two 2013 Ford F-450s with lifts and two 2016 Chevy 3500s. The fifth is a 1996 Chevy 3500 flatbed with stake body that can carry six portable restrooms.

Two dump trucks are used in septic tank installations: a 2006 Kenworth with Morgan dump body and a 2000 Sterling. Four excavators include two Kubotas, a Volvo and a Takeuchi.

BACK ON OUR FEET

"Before the fire, we had tried to move the truck fleet toward a single manufacturer because we thought that it might be easier for in-house maintenance and stocking replacement parts," says Desmond. "We now have a menagerie of trucks from a range of manufacturers and I can honestly say that it doesn't appear to make much of a difference."

He notes that the company may have lost five or six portable restroom contracts in the first weeks following the fire.

Before the fire, we had tried to move the truck fleet toward a single manufacturer because we thought that it might be easier. ... We now have a menagerie of trucks from a range of manufacturers and I can honestly say that it doesn't appear to make much of a difference.

GERRY DESMOND

"Ironically, the publicity resulting from the fire probably made up the business with new customers," says Desmond. "While I wouldn't wish a fire on anyone, it helped us to focus on defining and rebuilding the core of our business. Almost two years after the fire, we're in a better position than before the fire. We're a more focused and efficient company."



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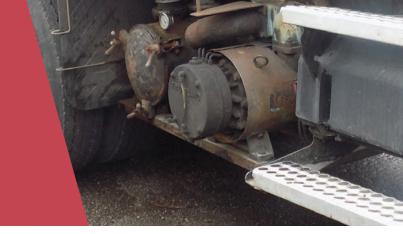


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- **1.** A solar panel unit that will recharge the battery to power the 12-volt water pump that provides flushing abilities 24/7 to the RV porcelain bowl. No matter where you are on this earth, you can adjust the tilt of the panel to capture the sun.
- **2.** An odor exhaust fan to remove odors.
- **3.** The water and waste tanks hold about 43 gallons of water and 68 gallons of waste.

Note: Frequency of pumping will depend on volume, etc.

- **4.** We use non-potable water so as not to waste drinking water.
- **5.** An RV bowl that requires only 16 ounces per flush or half full, to carry the solids through the neck of the bowl.
- **6.** Chemical deodorizers are not needed to control odors.
- 7. A pressure plate switch below the polyethylene floor mat, allowing the lights and fan to turn on and off upon entry and exit.
- **8.** An electric 12-volt water pump creates a washdown feature so anyone having a fecal accident can clean the unit without the help of others. You can clean the interior first, then refill the water tank. There's no need to move the pump truck or drag a hose around or between the units.
- **9.** The water fill, battery box and waste tank openings are all in the rear of the unit, so attendees can still use it while it's being cleaned. Without having to get equipment in and out of doors, you can clean it faster than a chemical portable restroom.
- **10.** The Sure Seal™ odorless waste tank design is like a P-trap in your home. No chemical deodorizers are needed, so profits are saved.

 The unit vent pipe above to the rear will exhaust the fecal odor gases.
- **11.** The invention of plastic produced three great products in the early 1970s, the models of Poly-Portables, PolyJohn and Tufway. Other portable restroom products have since come to market,

but we've been told these have been the most sold over time.

- 11a. Because of that, we have adopted these three models for our retrofit kit. Vendors who own one of these great portable restroom shells will not need to purchase another model. The existing model will fit on our retrofit tank, solar panel roof top, and fan adapter.

 The idea is to use your existing models and reduce the cost of another purchase of walls, doors, and roof tops, while still owning a restroom with a solar panel feature. Use older models for construction. Save your profits.
- **12.** These units are not air conditioned. They're designed as an inbetween of the high-end air conditioned units and chemical portable restrooms.
- **13.** The industry standard of the chemical portable restroom is over 45 years old.
- **13a.** The cost to purchase a chemical portable restroom is about \$450-\$1,200. *Cost to purchase a single air conditioned unit is about \$3,900 to \$5,000. Nice units.*
- 14. Construction of our retrofit kit.

 We have designed the water, waste tanks and skid to be about 200 pounds of polyethylene material, 70 pounds for the water and waste tanks, and 60 pounds for the skid that holds the two tanks together. After adding the shell and bowl and fan adapter and solar panel system the unit will be heavy. A chemical restroom weighs about 100 to 175 pounds.
- **14a**. We created on the tank's side a set of forklift ports for easier placement and removal/loading onto the truck with a forklift. You can load it full of 43 gallons of water for delivery to an event. The size of the VIP Best 1 unit is about 48" x 72" long. Four can fit atop the typical truck bed.
- **15.** We made an adapter to recess into the roof and hold the exhaust fan to remove odors. The side vents must be sealed to work properly.

16. We offer an 80 watt solar panel; it produces almost 4.35 amps per hour in peak sun. Frequency of use to restoration will determine the size of battery wattage needed.

The solar panel bracket is also mounted on the back wall of the unit. It is reinforced by two

The existing walls are about 1/8" thick and not

enough to support the panel and adjuster alone.17. We have developed a patent pending towable dolly system attachable to the base of the unit; it is available as an option. Used only for

aluminum 1/8" straps inside and outside.

18. We were issued a utility patent pending by the U.S. Patent Office for copyright protection.

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Jeff Haden is a contributing editor for Inc.com and a LinkedIn

Watch out for These Nasty Employee Behaviors

Backstabbing, shirking responsibilities and planting seeds of distrust should get these nightmare workers the pink slip By Jeff Haden

t isn't the truly terrible employees who cause the real problems. Whether clearly incompetent or unbelievably lazy, they're easy to spot. With these workers, you quickly identify the problem — then let the person go and move on.

The real problems are caused by employees who appear to be doing a satisfactory job but meanwhile act like what a friend once called an "insidious cancer," slowly destroying other employees' performance, attitude and morale — and with them, your business.

Here are eight destructive qualities of employees you absolutely must address — or, worst case, need to let go:

1. They lead the meeting after the meeting

You have a meeting. Issues are raised. Concerns are shared. Decisions are made. Everyone in attendance fully supports those decisions. Then someone holds the "meeting after the meeting." Now she talks about issues she didn't share earlier with the group. Now he disagrees with the decisions made. And now, what was going to happen never will. Waiting until after a meeting to say, "I'm not going to support that," is like saying, "I'll agree to anything, but that doesn't mean I'll actually do it. I'll even work against it."

2. They say, "That's not my job"

The smaller the company, the more important it is that employees think on their feet, adapt quickly to shifting priorities, and do whatever it takes to get things done. Even if that means a manager has to help load a truck or the office staff has to perform a task in the shop. Any task an employee is asked to do — as long as it isn't unethical, immoral or illegal, and it's below his or her current position — is a task an employee should be willing to do. "It's not my job," says, "I care only about me." That attitude quickly turns a cohesive team into a dysfunctional group of individuals.

3. They act as if they've already paid their dues

An employee did great things last year, last month, or even yesterday. You're appreciative. You're grateful. But today is a new day. Dues aren't paid. Dues get paid. The only real measure of any employee's value is the tangible contribution he or she makes on a daily basis. Saying, "I've paid my dues," is like saying, "I no longer need to work as hard." And before you know it, other employees start to feel they've earned the right to coast, too.

4. They think experience is a tangible commodity

Experience is definitely important, but experience that doesn't trans-

Nothing important is ever accomplished alone, even if some people love to act like it. A good employee and good team player shares the glory.

late into better skills, better performance and greater achievement is worthless. For example, a colleague once said to younger supervisors, "My role is to be a resource." Great, but then he sat in his office all day waiting for us to come by so he could dispense his pearls of wisdom. Of course, none of us did stop by. We were all busy thinking, "I respect your experience, but I wish your role was to do your job."

5. They love gossip

Before a meeting, some of us were talking about supervisors in another department when our new boss looked up and said, "Stop. From now on we will never say anything bad about anyone unless they are actually in the room. Period." Until then, I never thought of gossip as a part of a company's culture — gossip just was. We all did it. And it sucked — especially because being the focus of gossip sucked.

Employees who create a culture of gossip waste time better spent on productive conversations. They also cause other people to respect their coworkers a little less. And anything that diminishes the dignity or respect of any employee should never be tolerated.

6. They use peer pressure to hold others back

The new employee works hard. She's hitting targets and exceeding expectations. And she eventually hears, from a more "experienced" employee, "You're working too hard and making the rest of us look bad." A great employee doesn't compare herself with others — she compares herself with herself. She wants to "win" that comparison by improving and doing better today than she did yesterday.

Poor employees don't want to do more; they want others to do less. They don't want to win. They just want others to make sure they don't lose. Saying, "You're working too hard," is like saying, "No one should work hard, because I don't want to work hard." And pretty soon very few people do — and the ones who keep trying get shunned for a quality you need every employee to possess.



7. They rush to grab the glory ...

OK, maybe he did do nearly all the work. Maybe he did overcome almost every obstacle. Maybe without him, that high-performance team would have been anything but. But probably not. Nothing important is ever accomplished alone, even if some people love to act like it.

A good employee and good team player shares the glory. He credits others. He praises. He appreciates. He lets others shine. That's especially true for an employee in a leadership position. He celebrates the accomplishments of others secure in the knowledge that their success reflects well on him, too.

Saying, "I did all the work," or "It was all my idea," is like saying, "The world revolves around me, and I need everyone to know it." And even if other people don't adopt the same philosophy, they resent having to fight for recognition that is rightfully theirs.

8. ... And they rush to throw others under the bus.

A vendor complains. A customer feels shortchanged. A co-worker gets mad. No matter what has happened, it's someone else's fault. Sometimes, whatever the issue and regardless of who is actually at fault, some people step in and take the hit. They willingly accept the criticism or abuse, because they know they can handle it. Few acts are more selfless than taking the undeserved hit. And few acts better cement a relationship. Few acts are more selfish than saying, "It wasn't me." At the best companies, everyone is in it together. Anyone who isn't needs to go.





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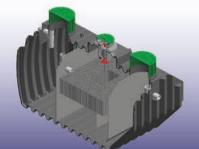
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18.5	70.0	2000	138	1450	25.4	1.181	30	0.906	23

Max. GPM	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	Bore Dia. in.	Bore Dia. mm	Stroke in.	Stroke mm
22.5	85.0	2200	151.7	1450	34.0	1.181	30	1.102	28

Max. GPM	Max. LMP	Max. PSI	Max. Bar	Max. RPM	Req. HP	Bore Dia. in.	Bore Dia. mm	Stroke in.	Stroke mm
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Florida Recommends Bypassing Water Softener Discharge Away from Onsite Systems

By Doug Day

n a memo to county health departments, the Florida Bureau of Environmental Health Onsite Sewage Program said it is now recommending that brine waste from water softeners not be discharged into an onsite wastewater system. This is a reversal of a position first taken in 2003, based on further research since then.

The memo states, "While more recent studies indicate that an 'efficiently run' water softener should not impair the OSTDS (onsite sewage treatment and disposal systems) and may enhance treatment, these appear to be the best-case scenarios. In worst-case scenarios, this practice results in the discharge of excessive amounts of salt and/or volume of backwash water into the system, which can affect the ability of the contents of the septic tank to properly settle, leading to increased solids bypassing the outlet filter and improper formation of the scum layer, as well as hydraulic overload of the system. It is also known that the soil structure of fine-textured soils can be affected by high sodium levels (decreasing) soil permeability, which can result in drainage problems. It is also possible to have leaks in the water softener unit, which can result in the discharge of hundreds of gallons per day of excessive water. Any excessive water being discharged over a sustained period will have an adverse effect on the OSTDS."

The agency is recommending against the practice for the following

- The volume from the water treatment system brine recharge has not been calculated into the estimated sewage flow, including using ondemand versus timed-recharge functions
- The effects of the volume and content of brine on an individual system cannot be predetermined based on regulations
- Accounting for lack of appropriate maintenance as well as inefficiently operated water softeners is beyond the scope of the permitting, use and maintenance of a septic tank system

A proposal to charge a half-cent sales tax to clean up the Indian River Lagoon passed easily in a November vote in Brevard, Florida. The tax passed with 62.3 percent of the vote. It will provide \$340 million over 10 years to clean the body of water, including removal of nitrogen and phosphorus that have been feeding algae blooms over the last five years, resulting in the deaths of manatees, dolphins, pelicans and other marine animals. About 66 percent of the money goes toward dredging muck and silt. Another \$10.8 million will go toward stormwater projects, \$9.4 million for sewer plant upgrades, and \$41.7 million for septic system removal and upgrades.

Maryland

New construction in Maryland will no longer be required to use the Best Available Technology (BAT) for septic systems statewide. BAT with enhanced nutrient removal has been required across the state since 2012, adding around \$10,000 to the cost of building a new home. Gov. Larry Hogan announced the rollback of the regulations by the Department of Environment last fall. BAT is still required in critical areas, defined as within 1,000 feet of tidal water. Such systems also require a service agreement for operations and regular maintenance. Local governments can still require BAT outside of critical areas.

Proponents of the BAT requirement say it helps protect water quality in the sensitive Chesapeake Bay, while opponents have said it harms economic development in the state. According to the DEQ, there are about 420,000 septic systems in Maryland, with 52,000 in critical areas. The Bay Restoration Fund Onsite Sewer Disposal System grant program has upgraded more than 8,000 septic systems to include technology that removes nitrogen from the effluent.

New Jersey

The New Jersey legislature may fight the proposed relaxing of rules governing the number of septic systems allowed in the Highlands region, stretching for 60 miles along the Atlantic Ocean that provides about 70 percent of the state's drinking water. The current standard is one individual septic system for every 25 acres of non-forested areas and one for every 88 acres of forested land. The new density standard, announced in spring 2016, establishes three zones and would increase the number of allowed septic systems by about 12 percent: developed communities (32,896 acres) — one system per 11-acre lot; agricultural and woodlands (54,555 acres) — one system per 12-acre lot; lands important to water quality protection (327,449 acres) — one septic system per 23 acres.

The state Senate held a hearing to question state and federal officials about the methods used to establish the new limits, and a bill has been introduced in the Assembly to block the new rules.

Rhode Island

A referendum allowing a community septic system loan program in North Kingstown Township passed with 67.4 percent approving (9,454 votes) and 32.5 percent against (4,554 votes). The referendum allows the town to set aside \$2 million for loans to residents and homeowners to upgrade their septic systems to rid the town of cesspools. While new cesspools have been banned since 1968, a 2015 law requires all of them to be disconnected within 12 months of the sale of a property.



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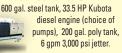
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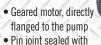
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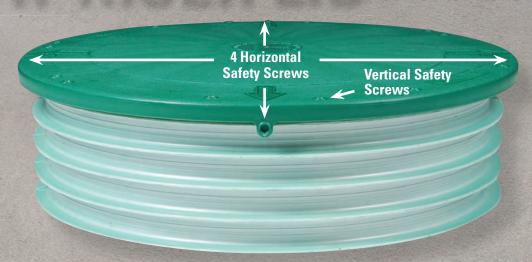


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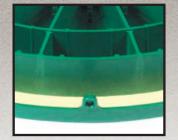
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Right: The Miene Septic Service crew is shown with one of the company vacuum trucks, a Peterbilt 367 built out by Advance Pump & Equipment with 4,200-gallon aluminum tank and National Vacuum Equipment blower. From left to right are Joedy Hurtt, Dylan Jacobs, Anthony Schmitz, Rick Miene and Ray Heasty.

Below: Equipment operator Ray Heasty uses a Bobcat excavator to dig for a new septic tank at a home in Cedar Rapids, Iowa.





Rick Miene, 48, took over the business in 2008 when his father, Richard, retired. On his team are two office workers, including his mother, Faith, three technicians handling septic maintenance and inspections, four installers, a dump truck driver and a grader operator. Camron Miene, Rick and Faith's 17-year-old son, is also starting to work in the business. Rick Miene also does a lot of grading, but fills in anywhere needed.

"It's funny how many hats an individual has to wear," he says.

The company works in a 50- to 75-mile radius of the Cedar Rapids area. Septic pumping, repairs, time-of-transfer inspections and installations account for 90 percent of their work. The balance is anything they can do with the equipment they've got — land clearing, grading, basement excavations, driveway installations and snow plowing.

MAINTENANCE SERVICES

The two technicians on the maintenance side handle pumping and time-of-transfer inspections. They are also certified service providers for annual maintenance contracts the Iowa Department of Natural Resources requires on certain septic systems.

Pumping is done with two Peterbilt 367s (2011 and 2015) built out by Advance Pump & Equipment with 4,200-gallon aluminum tanks and National Vacuum Equipment blowers, each equipped with a RIDGID SeeSnake camera, a Crust Buster tank agitator and a Nasco Whirl-Pak Sludge Judge for measuring solids. The company is starting to put safety features on their

vehicles — reflective detailing and strobe lights — to make sure the guys can be seen at all times. One truck has a back-up camera — not foolproof, but a nice tool to have, Miene says.

The office staff makes reminder calls to customers for maintenance. Miene likes to have homeowners present during septic service, not only to help flush toilets, but so technicians have an opportunity to educate users

about how their system works. He's concerned about clean water and believes putting water back into the ground is the right thing to do to replenish the aquifers. And homeowners play an important role by properly caring for their systems, he says.

ONSITE WORK

Each year the company installs 40 to 50 systems during an eight-month weather window. Most are replacements of failing systems discovered through real estate inspections. Although they install conventional systems, most are more advanced, primarily sand filter systems, AdvanTex units from

Then we just started buying more attachments and doing more for people, and really trying to accommodate them while they were already under construction. We could get their properties into better shape for their needs.

RICK MIENE

Orenco, and Coco Filter systems from Premier Tech Aqua.

The majority of work is residential, but they also get involved in commercial systems. On bigger projects, Miene learned the hard way that his ability to do a job right is often dependent on others doing their jobs right. In one situation, they placed four 5,000-gallon concrete tanks weighing 38,000 pounds each at a site. As they started to backfill, it began to rain and the tanks floated out of the ground because another contractor had not properly

(continued)



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Above: Rick Miene, Anthony Schmitz and Dylan Jacobs install components of an Orenco AdvanTex system at a home in Cedar Rapids, Iowa.

Right: Dylan Jacobs, left, and Anthony Schmitz seal a concrete tank lid during a septic system installation.

filled them with water. "It reminds me to go the extra step and make sure everybody is doing what they're supposed to do," he says.

The company has three excavators, all zero-tail-swing models — a 12,000-pound Bobcat E50, a 20,000-pound Bobcat E85 used for most of their septic installs, and a 56,000-pound John Deere 245. For skid-steers they have a wheeled Bobcat S300 used to move attachments around and for snow removal, and three tracked Bobcat T770s, one for grading and timber clearing, one for installs and a third for miscellaneous applications.

Other equipment includes two triple-axle dump trucks — a 2000 Sterling with a Beau-Roc dump body and a 2016 Mack with a Henderson Products dump body, a John Deere 650 crawler dozer used for site development, and a John Deere tractor with an attached Bush Hog flex-wing rotary cutter.

Horse country

Rick Miene, owner of Miene Septic Service in Robins, Iowa, is not a horse person, but in rural Iowa a lot of people are, including his 12-year-old daughter Marissa. So naturally he's been drawn into that world.

Of course, a lot of horse ranches have septic systems, so he's developed a good clientele through networking, maintaining and installing systems. But as he's picked up more equipment, he's been able to branch out and do other things for the equestrian crowd.

"One of the big things we've been doing is building horse arenas, whether it be a residential or a commercial site," he says. For these projects, whether fenced-in outdoor arenas or wood-construction indoor facilities, the company constructs the riding pad, which involves site clearing, excavation of topsoil, compacting and grading the soil base, and laying down a sand footing.

Miene has also gotten involved in supporting the National Barrel Horse Association, the organization his daughter belongs to. He sponsors some of their activities and donates grading and leveling services during events. In return he puts up a company banner at the arena.

"Septic work can open a lot of doors," he says. "It all works hand in hand."

A Kubota BX25 backhoe is used for inspections. Over-the-deck 25-foot trailers from B & B Trailers are used to haul equipment.

CARE OF THE FLEET

The company has always kept its vehicles and equipment indoors.

"We're pretty proud about the equipment, so we want to keep everything nice. And we have a lot less issues in the winter with startups." By 2010, they purchased more land and built a 17,000-square-foot structure — but they're outgrowing that, too, he says, and looking to add on.

Miene says their trucks are a major source of advertising. "It's the first



impression," he says. "Every unit is a billboard that's going down the road." They work hard to keep the trucks shiny and spotless, and Miene credits his kids, Adriana, 20; Camron; and Marissa, 12; (and soon 6-year-old Raegan) with being big contributors to that effort.

The company performs routine equipment maintenance when they have time, otherwise they outsource it. They try to avoid major problems by keeping the fleet relatively new, but these days Miene's enthusiasm for buying new equipment has been tempered a bit as he faces increased costs and maintenance requirements resulting from the U.S. Environmental Protection Agency's Tier 4 emissions rules that apply to more and more of his machines.

"There's been some real trying times to figure out financially is it time to buy the new machinery or do you wait? You're scared about what the maintenances are going to be and the quirks to all of that," he says.

Like everyone, Miene has no choice but to deal with keeping trucks topped off with diesel exhaust fluid (DEF) and vehicles going into regeneration mode. "The frustrations are there and I think will continue," he says, "but you live and learn, and you learn to adapt."

BRANCHING OUT

When the company started installing septic systems, Miene quickly saw other site work opportunities. Using the skid-steer, he started doing his own grading and then offered that as an added service.

"Then we just started buying more attachments and doing more for people, and really trying to accommodate them while they were already under construction. We could get their properties into better shape for their needs." By the late 1990s they'd accumulated several pieces of equipment and grew the staff to handle the workload. "It was starting to become a real,

'Wow, what did we get into?" Miene says, "But things were just working."

Once they bought the big excavator, they began digging basements and putting in small ponds, or occasionally installing water and sewer lines. Working for developers, they saw the need for land-clearing equipment, so they picked up a number of forestry attachments for their skid-steers and doing everything from building driveways to clearing fully timbered areas.

When work slows down in the winter, they put plow blades on the trucks and wheeled skid-steer and offer snow removal services. Employees typically take vacations or work on an on-call basis during the off-season.

Miene says the crew thrives on unusual challenges. For example, in 2016 they had a contract to install a commercial septic system at a new facility for the Indian Creek Nature Center in Cedar Rapids. They were eventually asked to also build an amphitheater at the facility using natural stone from the adjacent hillside. "That's the neat thing," he says. "One day it might be one thing, the next something totally different and once in a while something totally off the wall."

We have a real dedication to the customer being satisfied. I like it when you see them light up and they're happy about what they get in the end.

RICK MIENE

In another interesting twist, a residential customer had them install his septic system, which led to grading work, then building a pond — and then to his eventual employment with the company. Miene now calls Kyle Mekvinda the rock of the company. "He's the go-to guy; positive about everything and great with customers."

KEEP CUSTOMERS HAPPY

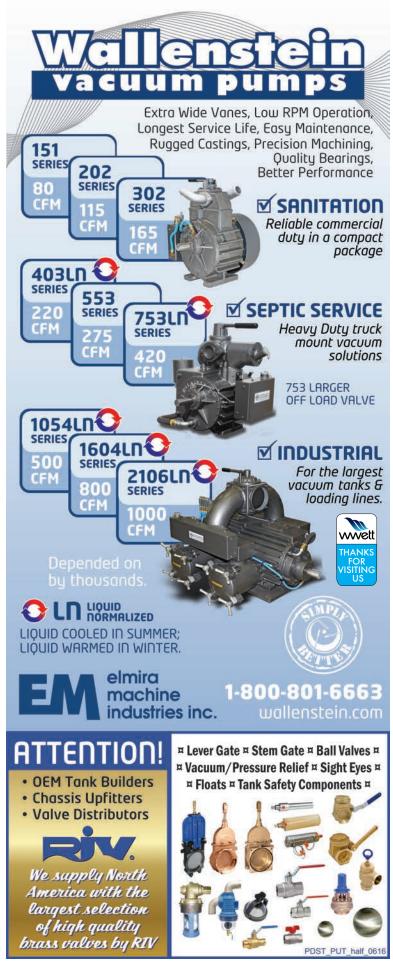
Miene says one of his favorite things about the business is meeting people, getting a vision of what they want to do and figuring out how to make it happen.

"Maybe they want a new septic system, but they also want a (home) addition. We try to problem-solve and maybe even look a little further and say, 'What if we move it over here so you hide your tank and at the same time give it a little better location for servic-

ing?' There's a lot of things people don't think about and we might be able to come up with something that may actually work out better for them.

"A happy customer makes it all worthwhile," he says. "We have a real dedication to the customer being satisfied. I like it when you see them light up and they're happy about what they get in the end." \blacksquare





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Jim Anderson, Ph.D., is an emeritus professor at the University of Minnesota Department of Soil, Water and Climate and recipient of the pumping industry's Ralph Macchio Lifetime Achievement Award. Email Jim questions about septic system maintenance and operation at editor@pumper.com.

Tips You Must Share with Pumping Customers, Part 2

When they follow these operation and maintenance rules, homeowners will be happier and you'll have fewer emergency calls By Jim Anderson, Ph.D.

ast month I discussed the first five things you need to tell homeowners about their septic system. They were: 1) Provide a diagram of their system; 2) Explain the system design capacity; 3) Talk about how water usage habits impact the system; 4) Promote regular maintenance; and 5) Tell them what to avoid flushing into the system. Here are the remaining five important things a homeowner should know:

6. Tell them not to build over the septic system. There are a number of items in this category. Don't install a deck or patio over their septic tank or any other type of tank in the system. Since sewage tanks are usually installed near the residence, they are sometimes in the area where a homeowner would like to put a patio or another outdoor living space. They should not do anything that would limit access to the tanks or the house sewer with clean-outs. Putting a trap door in the deck is not a good solution to this problem. Also, no additional fill should be placed over the soil treatment area other than cosmetic filling of areas over trenches where settling may have occurred.

7. Explain how excess water runoff can cause hydraulic failure. Water from surfaces such as roofs, driveways, garages, etc., should not be allowed to drain over any part of the system. This could potentially flood out the drainfield. All runoff should be diverted away from the system. This may involve installing roof gutters or landscaping berms to direct water away from the system. In addition to the potential for flooding the system, extra water can cause additional biomat to form by reducing the oxygen available for the breakdown of the organic portion of the wastewater. This, in turn, reduces the long-term acceptance rate of the soil, meaning a reduction in system capacity.

8. Caution them to be careful when landscaping around the system. Make sure not to put fill over the system, but also keep heavy equipment used to haul landscape materials from running over the system. One client years ago wanted a tennis court in that open yard out back without realizing the area was occupied by his septic system! He got to replace his drainfield in addition to building a tennis court. As I did, you probably wonder about the wisdom of the contractor who was doing the grading on that project. Plant choice over the septic system can also have a negative impact through root intrusion.

Trees and shrubs should be kept away from the system and any plant-

Educating homeowners and getting them actively involved in the care of their septic system will make for more satisfied customers and provide you with more business.

ing other than grasses should be shallow-rooted over the soil treatment area. It is amazing how roots from water-loving plants can penetrate parts of the system, clogging pipes and interfering with performance. Sprinkler systems can also add too much water to a system. If watering is necessary to maintain grass during dry periods, manual sprinklers should be used. This often happens with mound systems where I live. The soil on the top of the mound dries out, making it necessary to add water to keep the grass growing.

9. Tell them to keep off the grass! Avoid any unnecessary foot or animal traffic over the soil treatment area and avoid vehicle traffic over any part of the system. It is amazing how often the drainfield area is looked at as an ideal parking area for a boat or RV. Since most systems are relatively shallow, this traffic can damage pipe as well as compact the soil in the soil treatment area, which interferes with the acceptance of sewage effluent. In the winter in my part of the world, parking snowmobiles in the area or tying the dog out on top of the mound can help drive frost into the soil. This can cause freezing in supply pipes between parts of the system.

10. Show them how to do a homeowner check of the system. They should walk around the soil treatment area checking for any evidence of effluent surfacing, rodents digging into the area or other potential problems. If there are inspection pipes on the trenches they can see and record how much of the system is being used. This information can help them regulate water use and call you as the service provider at the first sign of a problem rather than letting things go until there is a much larger problem. Emphasizing early warning and recognition can prevent really bad experiences later.

Educating homeowners and getting them actively involved in the care of their septic system will make for more satisfied customers and provide you with more business, while protecting health and environment. If you have more items to add to our homeowner education checklist, send the tips to me and we'll feature them in a future column.



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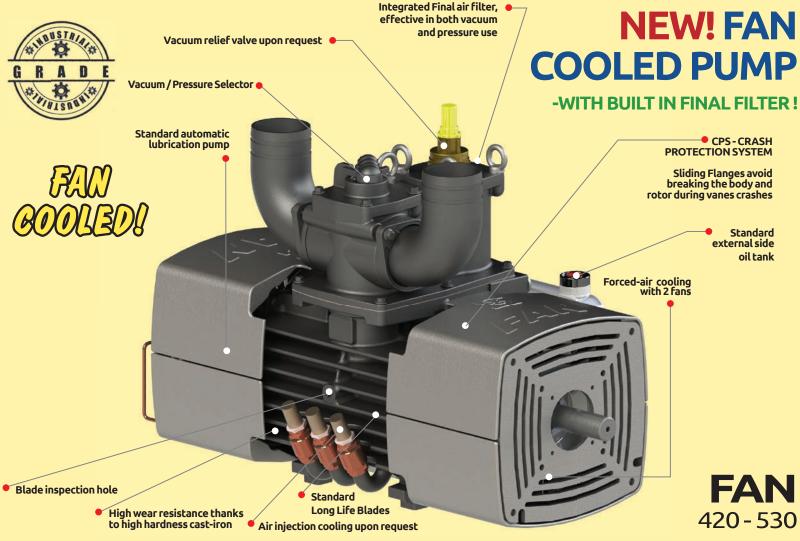
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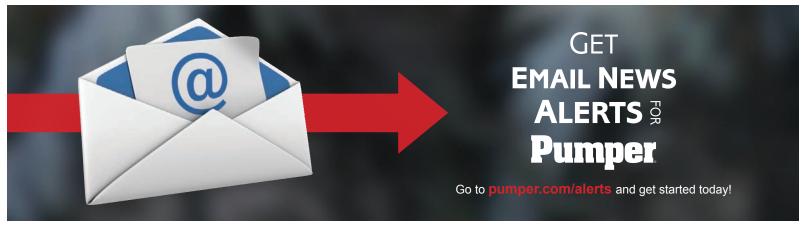
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Erik Gunn is a magazine business writer in Racine, Wisconsin. Direct inquiries to him at editor@pumper.com.

Are Employees Driving Your Rigs After-Hours?

Watch out for the tax consequences of sending your fleet of trucks home with your employees By Erik Gunn

oes your septic service business have a fleet of company-owned service trucks?

Dumb question! Of course it does.

Do you cover a sizeable territory — larger than a small town, say? Chances are pretty good the answer to that is "yes," too.

And do some of your employees drive their service trucks home after work — at least sometimes — so that the next morning they can drive straight to the day's first job without stopping at the shop?

If your response is another "yes" — well, no surprise there. Especially if your business reaches beyond your city limits, or even crosses county lines, and if your workforce is just as far-flung as your customers, that sounds like a commonsense practice.

TAX IMPLICATIONS

Say that your technician lives 15 miles away in the next town and the first customer on tomorrow's calendar lives in that very same community. Isn't it smart scheduling to send Frank to that homeowner right away?

If your driver doesn't first have to travel to the shop, get in his service truck and drive back, he could be at the customer's home up to a half-hour earlier. It can be a great way to save your customers money and help your business maximize the number of service calls you can make in a day.

Many contractors may take this practice for granted. If you're one of them, pay close attention: You need to make sure you're doing it right so that the IRS doesn't come back to bug you. Yes, it's an obscure problem, but that doesn't make it any less real. As with many wrinkles in the tax code, what you don't know can hurt you.

On the bright side, careful but fairly straightforward recordkeeping can solve the problem without dropping the basic practice.

DEDUCTIBLE OR NOT?

Tax attorney Patricia Hintz, a partner at Quarles & Brady in Milwaukee, counts many small businesses among her clients, and small-business ownership runs in her family.

Hintz was explaining the broader tax issue of how company vehicles get used day to day when this specific subject came up. "Vehicles are a real hotbutton issue," she says. Company fleet vehicles are no exception.

Whether we're talking about a company-owned vehicle or a private vehicle that an employee uses on the job, issue No. 1 is this, says Hintz: The only tax-deductible miles are the ones driven for work. Commuting miles don't count.

A simple example: Suppose you, the business owner, drive a car owned

by your company. During the day you drive it to meetings with clients, to check on your work crews at their job sites, and more.

All those on-the-job miles are legitimate business miles. They qualify for a deduction on your business federal tax return. (The same is true if you don't have a company car but simply make those trips with your personal vehicle; the only difference is that the deduction for the mileage would be made on your personal income tax return — not the one your business files.)

But some miles you drive every day aren't deductible — either in the company car or in your personal car: the miles you commute back and forth from home to work. IRS rules treat those as personal miles.

SERVICE COMPLICATIONS

See how this can get complicated with service fleet vehicles?

Suppose your next-town-over employee drives a service truck home from the shop at the end of every day, and drives back to the shop first thing every morning.

Those are commuting trips. Your company can't treat them as business mileage even though they're driven in your business service truck.

But remember — one of the reasons you and many service contractors permit employees to drive service vehicles home is so they can go straight to that first job — and, in all likelihood, home from the day's final job.

In that case, the very first leg of the day from the employee's house to the first customer's location should be counted as commuting miles and therefore not tax deductible for your business (the truck's owner). The same is true for the last leg of the day: The miles driven from the last customer to the employee's home are nondeductible commuting miles.

All the other miles in between, from the first customer to the shop to every other job of the day and to the last customer, are legitimate, deductible business miles.

So you need to make sure your employee differentiates between those first and last nondeductible commuting legs and all the other deductible travel during the day in performing the job.

OTHER COMPLICATIONS

But here's another wrinkle: The gas that the tech uses to drive from home to work and back every day. If you're not charging the employee for it, that's a form of income that must find its way onto your employee's annual W2 form come tax time.

You could charge it back to your employee, but do you really want to send a message that makes you, the boss, look money-grubbing? Psychologically, if for no other reason, it's better just to add it to the employee's

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income statement. It's probably easier to manage your records that way, too.

A bigger headache can arise when employees make personal use of the company vehicle on their own time. If you don't capture those costs, they risk turning into a black hole. And once again, they need to be included in the employee's income statement.

Mileage records are essential for those nonbusiness uses, Hintz advises. Better yet, set strict rules on how employees use the vehicle off-hours.

Still another complication involves on-call policies. For an employee who is on call overnight and so drives the service vehicle home, that might not count as commuting, Hintz notes. The key will be exactly how your on-call responsibilities are worded, among other things.

Ultimately, you'll need to consult with your lawyer and tax professional to draw up clear policies and procedures about how and when your employees take your service vehicles home.

KEEP GOOD RECORDS

Make sure there is clear recordkeeping and consistent application of the rules. And make sure you keep good records. Numerous smartphone apps can keep personal or business mileage records. If your techs use smartphones on the job, it's worth investigating which of these tools might best help your business easily keep records and transfer them to whatever form you need for your annual business tax return.

By taking care to cross those t's and dot those i's, you can reap the benefits of flexibility and efficiency that come with enabling employees to take service trucks home for a legitimate business purpose.

And you can do so without getting tied up in tax knots.. ■

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MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTOR LOCATIONS
BIO MICROBICS Bio-Microbics, Inc. 8450 Cole Parkway Shawnee, KS 66227 800-753-3278 • 913-422-0707 Fax: 913-422-0808 sales@biomicrobics.com www.biomicrobics.com	FAST BioBarrier	150 to 600,000+	1996	Simple, works on any scale. Recommended for various residential/commercial property needs for any size from upgrading existing septic systems to multi-family, new construction developments, using FAST Systems solves most onsite wastewater treatment issues. With a small footprint, the RetroFAST system is ideal to upgrade an existing tank. The MicroFAST offers higher levels of nitrogen removal (NSF/ANSI 245). With the SFR feature, intermittent operation of the blower reduces electricity usage up to 45% and can provide improved nitrogen performance (in specific situations). Enables cost-effective treatment with less maintenance and more reliability, than most other biological process treatment systems. Sustainable Water Engineering dramatically simplifies the settling, screening, direct aeration	U.S. and 70+ Countries
See ad, page 81	MBR	100,000		and ultrafiltration of the wastewater treatment process to remove 99.9% of the contaminants. Installed above or below grade, locally-sourced tanks and certified to NSF/ANSI 40 class 1, NSF/ANSI 245 (nitrogen reduction), and NSF/ANSI 350 standards, this blackwater/ greywater treatment system establishes the material, design, construction and performance requirements for onsite residential and commercial applications. The BioBarrier MBR and HSMBR, from 500 GPD to 100,000+ GPD flows, meets water quality requirements that can be used for restricted indoor water use and/or unrestricted outdoor water use.	
	SeptiTech STARR	150 to 600,000+	1996	Trickling Filter Systems. STAAR (Smart Trickling Anaerobic/Aerobic Recirculation) Filter Systems are designed for both residential and commercial wastewater treatment applications. The STAAR System treats high organic loads that integrate with other technologies and accessories. The simple, automatic and reliable equalization and clarification process maintains low levels of Nitrate-N with all below-grade components that fit in readily available concrete, plastic or fiberglass tanks. SeptiTech's "Smart" technology allows the system to go into a sleep mode that will dial down activity and eventually shut all power off until normal flow conditions are detected.	
CromaFlow, Inc. 143 Lumber Ln. Montoursville, PA 17754 570-435-5550 Fax: 570-435-5570 info@cromaflowinc.com www.cromaflowinc.com See ad, page 38	Water & Wastewater Treatment System	500 to 1 million	1965	Provides on-site advanced secondary and tertiary treatment for wastewater, recycle and reuse applications to improve water quality and exceeds World Health Organization requirements.	Worldwide
Eliminite, Inc. PO Box 359 Belgrade, MT 59714 888-406-2289 info@eliminite.com www.eliminite.com	Eliminite Grizzly	Up to 50,000	1997	The Eliminite 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, worker 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.	U.S.
Eljen Corporation 125 McKee St. East Hartford, CT 06108 800-444-1359 info@eljen.com www.eljen.com See ad, page 85	GSF	Scalable to site conditions	1982	The Eljen Geotextile Sand Filter (GSF) is an advanced wastewater treatment and dispersal technology. The GSF's unique design provides treatment and dispersal in the same footprint while keeping installations easy and maintenance minimal. Independent testing has shown that the Eljen GSF's performance meets NSF/ANSI Standard 40 and provides advanced treatment of septic tank effluent to better-than-secondary levels.	North America and Australia

MANUFACTURER	BRAND	GPD	RELEASED	DESCRIPTION	DISTRIBUTOR LOCATIONS
ност	LA-Hoot	500 to 1,000	1986	LA-Hoot is an improved version from the original Hoot Treatment System introduced in 1984. Results are better than 10/10 mg/L on CBOD asd TSS, with more than a 95% reduction of the wastewater influent. Two-year warranty/NSF Standard 40 certified.	Nationwide
Hoot Systems, LLC 2885 Highway 14 E Lake Charles, LA 70607	H-Series	500 to 1,200	1995	Five-stage, one piece system with a pretreatment tank, aeration chamber, final clarifier, optional disinfection device and a pump tank. Results are better than 5/5 mg/L on CBOD/TSS. A 99% reduction on CBOD and TSS. Marketed as BNR in MD and FL with Biological Nitrogen Reduction of >50%. Three-year warranty/NSF Standard 40 certified.	
888-878-4668 • 337-474-2804 questions@hootsystems.com www.hootsystems.com See ad, page 17	ANR	450 to 900	2007	Adds Advanced Nutrient Reduction to the Hoot System. Results of 5.8 mg/L on TN, better than 10/10/10 mg/L on CBOD/TSS and Total Nitrogen. Areas where 10 mg/L is the discharge limit for Total Nitrogen, the federal level for drinking water. Three-year warranty/NSF Standard 40 and 245 certified.	
Hydro-Action PO Box 640 Plymouth, IN 46563 574-936-2542 • 800-370-3749 pete@hydro-action.com		500 to 6,000	1988	The Hydro-Action technology utilizes an activated sludge treatment process, which constantly infuses oxygen to wastewater where aerobic bacteria metabolize the waste. We offer both residential and commercial treatment systems. Our commercial units are available as "Set-N-Go" designs for 1,000 to 1,500 GPD. Our technology can be modularly designed and treat up to 6,000 GPD. These units are made of lightweight, high-strengh fiberglass resulting in easier installation.	Contact us for local distributors
www.hydro-action.com	Nitrogen Reduction Series	500 to 1,500	2013	The Hydro-Action technology utilizes an activated sludge treatment process, which constantly infuses oxygen to wastewater where aerobic bacteria metabolize the waste. Then it separates in a clarification chamber without the use of media filters, carbon additives, or expensive, high maintenance technologies. We offer our products in a three tank combination as a single unit: pretreatment, aerobic treatment, and pump tank design as the "Set-N-Go" unit. Tanks can be sold as individual treatment plants. 72" tall standard and 52" tall Low Profile systems available. NSF Standard 40 & 245 Nitrogen Reduction approved. Nitrogen Reduction averaged less than 10mg/L TN and 79% reduction in Total Nitrogen removal.	
Jet, Inc. 750 Alpha Dr. Cleveland, 0H 44143 800-321-6960 • 440-461-2000 Fax: 440-442-9008	J 1500 BAT Media Plant; J 500-800 PLT R-Series	500 to 1,500 450 to 1,500		Jet's residential wastewater treatment plants employ the Jet BAT Process Media which provides the ideal environment for nature's own bacteria to thrive and grow. Great numbers of these living microorganisms attach themselves to this submerged structure to create a "biomass" that rapidly treats wastewater. The Jet 700++ Aerator provides the mixing and fresh oxygen the microorganisms require to live while the Jet BAT Process Media provides the environment to support the microorganisms that allow natural filtration and biological reduction to take place. Available in concrete and plastic.	U.S. and International
email@jetincorp.com www.jetincorp.com See ad, page 34					
Norweco, Inc. 220 Republic St. Norwalk, OH 44857 800-667-9326 (NORWECO) 419-668-4471 Fax: 419-663-5440 email@norweco.com	Hydro- Kinetic	500 to 1,500		The Hydro-Kinetic wastewater treatment system employs innovative Hydro-Kinetic filtration technology to produce the cleanest, most consistent effluent quality available. They Hydro-Kinetic system uses the extended aeration and attached growth processes to treat wastewater, and features innovative nitrification-denitrification technology. The Hydro-Kinetic FEU system is the only NSF/ANSI Standard 40 and 245 certified residentail wastewater treatment system to pass two consecutive back-to-back tests without performing routine maintenance for a full 12 months. It quietly, efficiently and automatically pretreats, aerates, flow equalizes and filters all wastewater returning only the purest effluent back to the environment.	North America, Central America, South America, Europe, Africa and Middle East
www.norweco.com See ad, page 71	Singulair	500 to 1,500		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.	
	Singulair Green	500 to 1,500		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.	
Presby Environmental 143 Airport Rd. Whitefield, NH 03598 800-473-5298 • 603-837-3826 Fax: 603-837-9864 info@presbyeco.com	Advanced Enviro-Septic	Varies	2005	Advanced Enviro-Septic (AES) is a passive 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.	30 States and 14 Countries
www.presbyenvironmental.com	EnviroFin	Residential/ Commercial	2016	The Enviro-Fin passive onsite wastewater treatment and dispersal system is designed to have a small footprint and ship easily, while maintaining and exceeding NSF/ANSI Standard 40 treatment. Effluent leaves the septic tank and enters the fin distribution unit, where it settles and breaks down suspended solids. Effluent is distributed to the eight treatment fins, which are filled with coarse green plastic fibers, filtering and digesting more suspended solids.	NH, ME, AL



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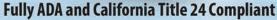


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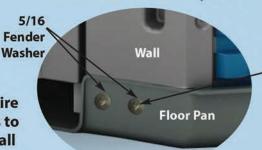






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Unit does not require angled metal parts to attach floor and wall







Trenching Deaths Double in 2016

Federal officials warn incidents show 'an alarming and unacceptable trend that must be halted' By Doug Day

ever again" he wrote on his Facebook page after a trench in which he was working collapsed in May. A month later, he was dead — killed in another trench cave-in.

He was one of at least 23 workers who died in U.S. trenching mishaps in 2016, compared to just 11 in each of 2014 and 2015. The Occupational Safety and Health Administration released the troubling statistic last November with six weeks left in the calendar year. "There is no excuse," says Dr. David Michaels, OSHA's assistant secretary of labor. "These fatalities are completely preventable by complying with OSHA standards that every construction contractor should know."

According to local media reports, the 33-year-old victim in Ohio posted "Never again ain't worth it" on his Facebook page after the first incident May

10, 2016. On June 15, he was killed when a sewer line trench that collapsed earlier the same day gave way again. Despite the history of instability, no cave-in protection was provided. OSHA issued the company two willful and two serious safety violations with a proposed penalty of \$274,359.

The citations state that the 60-foot by 12-foot-deep trench had no protection against cave-in, the walls were not property sloped, shored, benched or protected against collapse, and spoils had been placed within 2 feet of the trench. After the trench had collapsed earlier, workers were sent back in to dig out the caved-in soil from the trench. It later collapsed again, trapping the victim under 8 feet of dirt. His body was not recovered until several hours later.

Michaels calls the number of deaths "an alarming and unacceptable trend that must be halted." The dramatic increase in deaths comes as OSHA has a national emphasis program directed at trenching and excavation, which it lists as one of the most hazardous operations in the construction industry.

"It is truly sad that so many trench collapse fatalities are still occurring despite availability of a wide variety of shoring systems and trench boxes," says Tony Simunac, sales manager for Pronal-USA, which manufactures and sells the SmartShore inflatable trench shoring system. "The easier the system is to use, the more likely the crews will use it."

RULES ARE CLEAR

OSHA's Trenching and Excavation Safety fact sheet summarizes the requirements for trenching operations:

Do not enter an unprotected trench! Trenches 5 feet deep or greater require a protective system unless the excavation is made entirely in stable rock. Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer.

Protective systems

Protect yourself

There are different types of protective systems. Sloping involves cutting back the trench wall at an angle inclined away from the excavation. Shoring requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins. Shielding protects workers by using

trench boxes or other types of supports to prevent soil cave-ins. Designing a protective system can be complex because you must consider many factors: soil classification, depth of cut, water content of soil, changes due to weather or climate, surcharge loads (spoil, other materials to be used in the trench) and other operations in the vicinity.

Competent person

OSHA standards require that trenches be inspected daily and as conditions change by a competent person prior to worker entry to ensure elimination of excavation hazards. A competent person is an individual who is capable of identifying existing and predictable hazards or working conditions that are hazardous, unsanitary or dangerous to employees, and who is authorized to take prompt corrective measures to eliminate or control these hazards and conditions.

Access and egress

OSHA requires safe access and egress to all excavations, including ladders, steps, ramps or other safe means of exit for employees working in trench excavations 4 feet or deeper. These devices must be located within 25 feet of all workers. \blacksquare

General trenching and excavation rules

- Keep heavy equipment away from trench edges
- Keep surcharge loads at least 2 feet from trench edges
- Know where underground utilities are located.
- Test for low oxygen, hazardous fumes and toxic gases
- Inspect trenches at the start of each
- Inspect trenches following a rainstorm
- Do not work under raised loads





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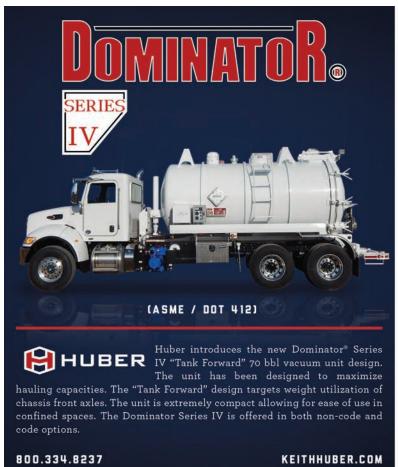
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Georgia Onsite Wastewater Association www.onsitewastewater.org; 678/646-0379

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

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NATIONAL

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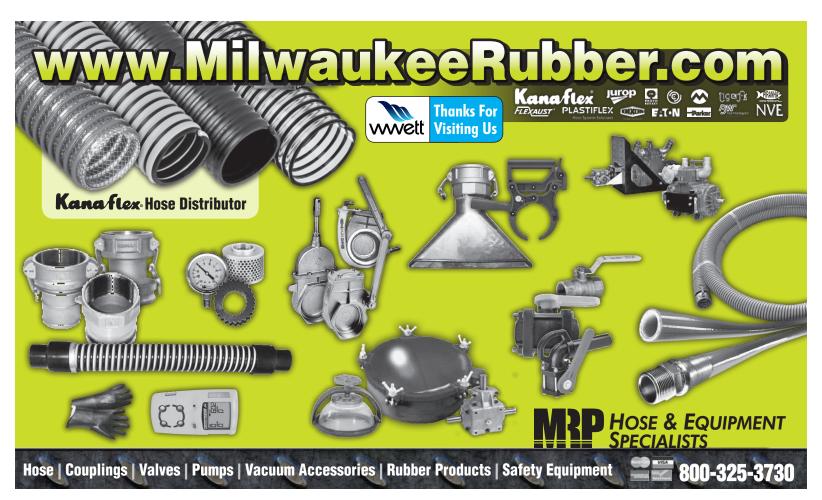
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Grease Composting Approval Requires Patience, Major Investment

North Carolina's Jason Gibson had no idea how much time and money would be necessary for the permit to dispose of his own grease trap waste By Doug Day

n 2010, Jason Gibson began thinking there may be a business opportunity in grease. He was already operating a successful portable sanitation company that had grown from one unit to 400 in about five years. His business, 64 Portables just outside of Lexington, North Carolina, was suffering a bit from a slowdown in the construction industry and was looking for new ways to diversify.

He had added septic and grease pumping to his portable restroom business and began studying grease recycling. Two years ago, he settled on his grease plan — composting it for soil enhancement in agriculture, landscaping and gardening. He purchased 70 acres of land less than a mile from his business and began what turned into a long engineering and permitting process.

Pumper: Does grease still have the potential you envisioned in 2010?

Gibson: I sure hope so now, after all this work. I think grease is a big growth opportunity. I don't know if it's in composting, dewatering, but I think grease is the big thing.

Pumper: You chose composting. How does it work?

Gibson: We're taking the grease, mixing it with wood chips, and putting it into windrows to compost. We have our own grease pumping company and are charging three other pumpers to accept their grease, about 10,000 gallons a week. We're trying to start out really slow with this.

The trucks come in and dump the grease into a 30-foot by 60-foot concrete pit that will hold about 8,000 gallons. We have a Caterpillar 906 loader with a 2-yard bucket and put in some wood chips, mix it up until it's dry, and put it into

windrows about 115 feet long. We get the wood chips from a friend of mine who runs Todco, a wood recycling and mulch company in Lexington.

There's more labor than I thought there would be. It has to be turned about every three days and we check the temperature every morning with a 6-foot thermometer. If it's not turned right, you're not going to make compost, you're going to make a landfill product. You have to mix the right wood chips with whatever grease products you have.

You really need to make sure when you step into this that you have the money. ... It was a several hundred thousand dollar project with buying the land, the engineering, buying the loader, the concrete pit ... and getting everything going.

- Jason Gibson



Pumper: Can you explain the challenge further?

Gibson: You need the carbon mix right. Depending on what material you bring in, you might need a wood chip that has a lot of nitrogen or one that has a lot of carbon. I've

Rubble is removed during construction of the clay base for the windrow area of the compost facility. (Photos courtesy of 64 Portables)

had a chemist working on this for quite a while. It has to sit at 130 degrees F for 30 days. But we're going to let ours sit for six months and have it tested by the University of North Carolina to make sure it's ready. Testing takes about five to seven days.

The compost can be used for any number of things from your yard to farms. We're wholesaling everything to one company right now. I think we're in really good shape with what we're doing, I think it's going to work out well.

Pumper: You started accepting grease last July after a permitting process that took a lot longer than expected. How long?

Gibson: It took us two years and two months. The (North Carolina) Department of Natural Resources is very familiar with it (grease composting) and everything has to be done according to their specifications and standards, and everything has to be engineered.

I wish someone would have told me about engineers and their prices. You really need to make sure when you step into this that you have the money. There was so much I was clueless about. It was a several hundred

(continued)

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thousand dollar project with buying the land, the engineering, buying the loader, the concrete pit — that was pretty expensive — and getting everything going. I had a geologist and a soil scientist. I had no idea until I got into it and got too deep to stop or I would have never started.

The engineers finally fought it out. We went from a clay pit to a concrete pit, and then they wanted the whole site concrete. I checked on the cost of that and it was going to be around \$400,000, so that obviously wasn't go-

Left: Grease waste is dumped into an 8,000-gallon, 30- by 60-foot concrete pit, where it is mixed with wood chips. A loader is used to move the compost material into 115-foot windrows on the company's 70-acre property.

Below: An operator uses a Caterpillar loader to turn a windrow of grease waste composted with wood chips. The piles must be turned every three days for proper composting.

ing to work. We got them back to allowing a clay base (to hold the composting material).

Pumper: What made you even start thinking about grease in 2010?

Gibson: Disposal costs in my area. Obviously there's grease being made every day and I thought there had to be a better way than dewatering it and hauling it off somewhere. So I wanted to do something to make a usable product. I just had to figure out what it was and composting was the answer for me.

I guess I'm just too dumb to stop. When I started this company I was working in a factory and didn't even know how to turn on the truck. I bought my first truck from Bill Abernethy (Abernethy Welding in Vale, North Carolina) and had to ask him to come out and show me how to work it, I

didn't even know how to turn on the pump. He said, "You won't be in business long." I bought six trucks from Bill before he died.

Pumper: What does the market look like for getting grease?

Gibson: I imagine I could get 15,000 to 20,000 gallons a day easily, but I'm not set up for that kind of volume right now. I want to go slow. There's a guy just north of me who started a compost facility and they had a meeting recently with 150 people trying to shut him down because of the smell. So I'm being very cautious with what I take, the amounts I take. I want to make sure I know what I'm doing so I don't get in over my head and have to start hauling stuff off to the landfill or having EPA problems.

Pumper: How does the rest of the business look?

Gibson: We're going wide open. We're running about 700 portable restrooms now and have about 150 customers for septics and grease pumping. We bought four loads of portable restrooms from T.S.F. Company in 2015 and

Jason Gibson can be reached at 336/250-9848 or jason@64portables.com.

a couple in 2016. In 2010, we only had a couple of drivers and now there are five plus me, and I don't have enough. I would like to have seven.

Pumper: What's your vision for five years from now?

Gibson: I'd like to see the company double in size. I don't know if I want to see the composting grow that fast. Maybe in five years I'll know what I'm doing and we'll have a 200-acre site. But right now, I'm so new into it that I just want to take my time and figure it out.

If I'm going to do anything, I want to do it right and that normally takes some time. I think that's where a lot of people mess up, even in the septic and portable toilet industry. They go gung-ho and want 10,000 customers, but don't figure out that they can't take care of all them. \blacksquare



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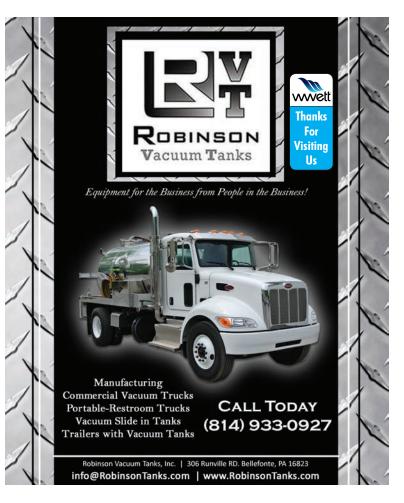
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wner Jason Long added a red and white 2013 International 7600 WorkStar built out by Imperial Industries with a 3,600-gallon steel tank and National Vacuum Equipment 4307 blower. The truck is powered by a 430 hp MaxxForce engine tied to a Fuller 8LL transmission. The truck has a 40,000-pound rear suspension and 18,000-pound front suspension. It features a driver's side heated 3-inch intake, two 4-inch heated rear intakes, a 6-inch air-controlled heated dump valve and two rear 1-inch lime and sample valves. It has three sight glasses in the rear and an NVE stainless steel float indicator on the driver's side. Bright work includes aluminum toolboxes, aluminum wheels and fuel tank. Interior features include AC, power windows, heated mirrors, cruise control, tilt steering and air-ride seat. Graphics were provided by John Krukowski at Acme Graphx. The truck is used for residential and commercial septic service. The driver is Kelly Hammerschmidt.

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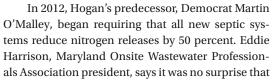
The Wastewater Industry Copes with Maryland Regulatory Flip-Flop

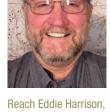
A new governor draws back on statewide advanced system requirements, prompting market changes for contractors and manufacturers By Doug Day

itrogen removal is no longer required for every septic system installed in the state of Maryland. The Best Available Technology (BAT) regulation has been unpopular in rural areas of the state that saw it as a barrier to development because of the approximate \$10,000 added cost for building a home.

Republican Gov. Larry Hogan announced the rollback of the regulations by the state Department of Environment in August during a speech to the state's Association of Counties, calling it a "cost-prohibitive burden on Maryland homeowners and businesses."

The change became effective in late November after a rulemaking process by the Department of Environment. The new regulation allows conventional septic systems outside of the Critical Area, defined as within 1,000 feet of tidal water, and such systems require a two-year service agreement for operations and maintenance, and must be inspected annually. Local governments can still require BAT outside of critical areas in order to protect public health or water quality, and all systems with design flows of 5,000 gpd or more still require BAT.





MOWPA president, at Harrison Contracting, 410/795-8691; rdsefe@aol.com.

Hogan overturned his action. "Not to anybody that's been aware of things. When Mr. O'Malley put it in, there was a very strong kickback amongst the rural voters that voted in Mr. Hogan."

Hogan's 2014 win over the then-Lt. Governor in the heavily Democratic state was seen as a big upset. Hogan campaigned on a theme of blocking taxes and regulations from the O'Malley administration. "O'Malley implemented it for political reasons and Hogan pulled it out for the same reasons," says Harrison of the BAT requirement. "Neither one did it for the environment or anything to do with the (onsite) industry, it was about satisfying a political agenda."

POTENTIAL IMPACT

According to the DEQ, there are about 420,000 septic systems in Maryland, with 52,000 in critical areas. The Bay Restoration Fund Onsite Sewer Disposal System grant program has upgraded more than 8,000 septic systems to include technology that removes nitrogen from the effluent as part of the efforts to clean up Chesapeake Bay.

On the Department of Environment website, Ben Grumbles, MDE secretary, published a statement saying the agency was committed to clean water and meeting the state's goals for cleaning up Chesapeake Bay.

"This is a measured step to reduce regulatory burden and build public support for a smarter and more effective septics program across the state," he wrote. "We are customizing the statewide requirement to meet local watershed needs more effectively while still insisting on excellent environmental results. Innovation and collaboration at the local level, rather than locking into one particular technology, will lead to more success in protecting and sustaining Maryland's precious environment. We will work hard to make sure it happens through regulatory reform, education, compliance assistance and enforcement."

Harrison says for the most part, members of MOWPA agree with Hogan's action to overturn the BAT requirement. A survey of members showed

0'Malley implemented it for political reasons and Hogan pulled it out for the same reasons. Neither one did it for the environment or anything to do with the (onsite) industry, it was about satisfying a political agenda.

- Eddie Harrison

about two-thirds, mainly installers and local regulators, were in favor of it and a third, equipment manufacturers and some installers, were opposed.

"It was sold as 'save the Bay," Harrison explains. "Any person with a basic knowledge of septic knows that the nitrogen (from septic systems outside Critical Areas) is never going to make it to the Bay." He adds that other benefits of BAT, such as protection of wells and groundwater and longevity of the systems, was not promoted when the requirement was added. "When you get a bad taste in your mouth about something, it's hard to convince you that it's good."

While there is support for the BAT rollback, some installers may be

lamenting the costs they incurred in meeting the 2012 law. "People had to invest a lot of money in training and materials to satisfy the change," says Harrison. "They spent, cumulatively, millions of dollars for equipment that is just going to be parked with weeds growing out of it. Most of our membership is glad it rolled back, but for a sector of our membership, it hurt them pretty bad."

Harrison says counties are adjusting to the new regulation. "Counties are handling it differently as far as modifying existing permits. Some coun-



ties are still leaving BAT as an option to put in depending on their soils and site conditions. There are some counties that like it (BAT) and still want to put them in. But they can't require them everywhere; they have to come up with a good reason to have it."

NOTHING IS FINAL

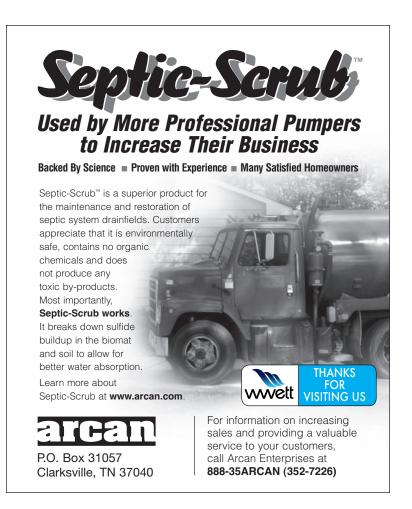
Politics being what they are, Harrison says the future of BAT regulations in Maryland is uncertain. "The (onsite) manufacturing industry really got upset. They've started their own movement to bring it back. They were upset that they were forced into the business. But once they made the investment, they're upset that they spent all that money for a few short years and now the bottom has dropped out of it."

There is also a chance the legislature, controlled by the Democrats, may get involved, though that has failed in the past. Democrat Gov. Parris Glendening (1993-'03) was the first who tried to get it passed into law without success. "O'Malley had tried earlier through legislation and it wouldn't go because the rural legislators' constituents wouldn't stand for them voting for it, so he did it by regulation right before he left office," says Harrison.

"Now Hogan has pulled it back through regulation. But now that it's already been in and all the pains of getting it started have passed, the legislature may — there's a chance that they will pass it for political reasons," he continues. "It's a Democratic legislature and a Republican Governor, so it may come back."

Because of the mixed feelings of its membership, MOWPA hasn't taken an official position. "It's all about politics; it's not about science. And it's very frustrating for those of us in the industry," Harrison continues. "Stay tuned."





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2011 MACK GU713 VACUUM TANK TRUCK MACK MP8 @ 505 HP, FULLER 10 SPEED TRANS, 20/46 ON AIR RIDE SUSPENSION, GALYEAN TANK, JUROP PUMP, 292"WB, 202"CT, DOUBLE FRAME



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Advanced Treatment Units

By Craig Mandli

ADVANCED TREATMENT UNITS

KNIGHT TREATMENT SYSTEMS WHITE KNIGHT MICROBIAL INOCULATOR GENERATOR

The White Knight Microbial Inoculator Generator from Knight Treatment Systems offers an enhanced form of aerobic treatment technology that introduces, cultivates and re-



leases 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. 800/560-2454; www.knighttreatment.com.

NITROGEN REDUCTION SYSTEMS

ANUA PURASYS SBR

The **PuraSys** sequencing batch reactor from **Anua** batches treatment in cycles, including aerobic and anaerobic steps, to clean water and reduce total nitrogen. It allows nitrification and denitrification to occur in the same chamber, saving space. The smart controls adjust aeration for varying flows, eliminating excessive air that can lead to system failure through sludge bulking. Flexible tank configurations include the retrofit of existing tanks. The system can reduce BOD₅ and TSS to less than 10 mg/L and provide greater than 50 percent total nitrogen reduction, per NSF 40 and 245 testing results. It can be scaled up for commercial applications. **336/547-9338**; www.anuainternational.com.



BIO-MICROBICS MICROFAST

MicroFAST wastewater treatment systems from **Bio-Microbics** are recommended for individual, small community and commercial applications. With a small footprint, the system is integrated into a standard septic tank

and does not require additional space. It is designed for low maintenance. Alternate modes of operation include recirculation of nitrified wastewater to the primary settling chamber for denitrification and (with the SFR feature) intermittent operation of the blower to reduce electricity usage and improve nitrogen performance in specific situations. 800/753-3278 www.biomicrobics.com.

NORWECO HYDRO-KINETIC GREEN

The **Hydro-Kinetic Green** wastewater treatment system from **Nor-**



cal, demand-use flow equalization device, as well as the Hydro-Kinetic Bio-

Film Reactor. 800/667-9326; www.norweco.com.

PREMIER TECH
AQUA ECOFLO BIOFILTER

The **Ecoflo Biofilter** from **Premier Tech Aqua** is now offered as a nitrogen-reducing unit, thanks to an add-on kit comprised of a pressurized flow divider that recirculates a fraction of the water back to the primary tank, and a simplex control panel that manages the dosing pump cycles and monitors all records. Available in ready-to-use rotomolded shells or as a kit to be integrated into exist-

ing tanks, this ecological, high-performance and low-maintenance septic system uses a natural and compostable coco husk-based filtering media capable of sustaining high hydraulic load rates, according to the manufacturer. The system is NSF-245 certified. **717/479-0005**; www.premiertechaqua.com.



STAAR residential trickling filter systems from **SeptiTech** are NSF/ANSI Standard 40, Class I and NSF/ANSI Standard 245 (nitrogen removal) certified. The clean effluent prevents biomat formation and leachfield clogging. They are compatible with shallow drip, direct discharge, pressure distribution, spray irrigation and conventional leachfields. Utilizing an enhanced, biological,



unsaturated media filter process, they are ETV-U.S. Environmental Protection Agency verified. With an optional UV disinfection system, the systems are designed for direct discharge or water reuse and engineered to fit most typical small-flow residential and commercial applications. 800/318-7967; www.septitech.com.

(continued)



2007 Freightliner M2-106 C7:

Cat 210 HP, 6 Speed, New Imperial 2500 Gal Alum Tank, 4" & 6" Heated Valves, NVE 607 Pump, 51,000 Miles



2004 Sterling LT9513:

Mercedes MBE 4000, 450 HP, 8LL Trans, Air Ride, 366,000 Miles, 5500 Gal Steel Tank, Steerable Pusher, Non Steer Tag, Alum Rims



2007 Freightliner M2-106:

MBE 900, 6 Speed, 2800 Gal Advance Tank, NVE Pump, Pusher Axle, Good Clean Truck



New 2015 W/Star 4700SB:

DD13 470 HP, Allison Auto, 20,000 Front 46,000 Rear TufTrac Suspension, New Imperial TMV3200 Steel ASME DOT Tank, 72" Rear Hyd Door, 20' Manways, Air 4" and 6" Valves, RCF500 LUFH Fruitland Pump \$200,970 FET In

> 2016 Western Star DOT Tank

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UV DISINFECTION EQUIPMENT

JET INC. ILLUMI-JET UV DISINFECTION UNIT

The Illumi-Jet UV Disinfection Unit from Jet Inc. is capable of reducing fecal coliform bacteria levels to well below the most stringent U.S. treatment standards, according to the manufacturer. It uses a germicidal lamp, which emits 95 percent of the ultraviolet energy at the wavelength of 254 nanometers. This wavelength is in the region of maximum germicidal effectiveness and is highly lethal to virus, bacteria, protozoa and mold. The disinfection chamber couples directly to any system's 4-inch discharge pipe, and is permanently installed below grade. When fully inserted, the lamp housing is correctly positioned by an integrated keyway near the top of the disinfection chamber and creates a well-defined flow path, ensuring system effluent has the proper ultraviolet exposure time. Under standard operating conditions, fecal coliform reduction exceeds 99.9 percent. 800/321-6960; www.jetincorp.com.

SALCOR 3G UV WASTEWATER DISINFECTION UNIT



The **3G UV Wastewater Disinfection Unit** from **Salcor** is for residential, commercial and municipal uses, and is UL certified NEMA 6P flood-proof and NSF/Washington State Protocol 6-month-tested (with 21 upstream treatment systems). It inactivates pathogens, including superbugs. Rated at 9,000 gpd gravity flow, it is a re-

liable building block for large water recovery/reuse systems, according to the maker. When installed in 12-unit parallel/series arrays with ABS pipe fittings, systems are disinfecting over 100,000 gpd. Gravity flow equalizes without distribution boxes. Each unit has a foul-resistant Teflon lamp covering, two-year long-life lamp, easy installation, minimal annual maintenance, and energy usage of less than 30 watts. **760/731-0745.**

WASTEWATER TREATMENT SYSTEMS

BIONETIX INTERNATIONAL BIO-BOOST TABLET 1T

Bio-Boost Tablet 1T from **Bionetix International** is a natural treatment for septic tank maintenance and aftershock treatment. It relies on a high-density, one-trillion-count blend of bacteria with biological nutrients and stimulants to naturally biodegrade paper, oils, greases and waste.



It can be efficient for treatment after toxic shock from the use of strong bleaches or other harmful chemicals, such as root killers for removing roots from pipelines. The tablet nourishes and replenishes bacteria in the septic tank to biologically digest waste and reduce sludge buildup. The manufacturer states that results can include reduction of odors and methane, prevention of pipe and drain blockage, and decrease of septic tank pumping frequency. It can replace chemical products and does not attack plastic or metal pipes. Use two tablets in the startup month, followed by one tablet per month for maintenance. 514/457-2914; www.bionetix-international.com.

PRESBY ENVIRONMENTAL ENVIROFIN

The **EnviroFin** passive onsite wastewater treatment and dispersal system from **Presby Environmental** is designed to have a small footprint and ship easily, while maintaining and exceeding NSF/ANSI Standard 40 treatment. Effluent leaves the septic tank and enters the fin distribution unit, where it settles and breaks down suspended solids.



Skimmer tabs located at the perforations prevent grease and suspended solids from leaving. Effluent is distributed to the eight treatment fins, which are filled with coarse green plastic fibers, filtering and digesting more suspended solids while creating a large bacteria treatment area. Each treatment fin has a perforated pipe functioning as an air duct across the top, providing oxygen to promote bacterial growth. 800/473-5298; www.presbyenvironmental.com.

SCIENCO/FAST SCICHLOR

The **SciCHLOR** sodium hypochlorite generator system with multi-pass SciCELL electrochemical activation technology from **Scienco/FAST** can produce an available supply of disinfectant solution. It is available in sizes

of 10 to 60 pounds chlorine equivalent per day to provide a reliable method of safely producing liquid chlorine for medium to large on-site disinfection applications, while surpassing operational efficiency performance requirements, according to the manufacturer. Connected to an incoming water source and with operating modes of batch, continuous, clean, setup and diagnostic, the brine solution multi-passes through a low-voltage DC electrolytic cell to produce the sodium hypochlorite. When it reaches the low-level float setpoint, the system automatically restarts to replenish its water supply. If no solution is used, the system shuts down to save power. With an 800 ppm FAC sample taken from the generator, the solution killed 100 percent of the Staphylococcus aureus and E. coli organisms within 30 seconds, the maker reports. **866/652-4539**; www.sciencofast.com.

WATER/WASTEWATER REUSE SYSTEMS

BOERGER BLUELINE ROTARY LOBE PUMP

The **Boerger BLUEline** rotary lobe pump is a self-priming, valveless, positive displacement pump used to convey viscous and abrasive materials. Applications include sludge, biosolids, grease, sewage, scum, lime slurry, alum sludge, permeate



and polymers, etc. There are 21 pump models in six series with pulsation-free operation, fully reversible rotation, dry-run capabilities and flow rates up to 7,500 gpm. According to the manufacturer, they are stable and wear-resistant with a maintenance-in-place design that allows for all wetted parts to be easily replaced through the front cover without the removal of pipe or drive systems. **612/435-7300; www.boerger.com.** ■

CLASSY TRUCK SHOULD BE A









Advanced Treatment Units

By Craig Mandli

CASE STUDY: BAKERY SEEKS SOLUTION FOR TREATMENT OF HIGHSTRENGTH WASTE

Problem: Rise'n Roll Bakery and Deli in Middlebury, Indiana, had an existing septic system that was no match for its increasingly large flows and high BOD of 6,000 mg/L.

Solution: Installer Akin's Excavating brought in Meade Septic Design to evaluate the situation. Meade developed a design that reused as much of the existing system as possible, while adding components



necessary to handle the flow. The final design incorporated 24-hour time dosing to 12 **AERO-TECH AT-1500** aerobic treatment units (four in parallel and three in series) from 8,000 gallons of time-dose tank capacity. This design also included 6,000 gallons of grease traps, 10,000 gallons of septic tanks, and absorption fields totaling more than 10,000 square feet.

Result: The bakery now has a relatively low-maintenance system that easily handles their unique, high-strength waste needs. **574/935-0908**; **www.aerotech-atu.com.**

CASE STUDY: UNITS HELP REDUCE EFFLUENT NITROGEN LEVELS AT SCHOOL

Problem: A school in Ontario, Canada, had an undersized wastewater treatment plant that was not meeting the Provincial Ministry of the Environment total nitrogen effluent criteria for subsurface discharge. Incoming flow was measured at 1,850 gpd with an ammonia concentration that ranged between 175 to 311 mg/L.

Solution: Modifications were made to treat the increased flows and to facilitate nitrification/denitrification processes to reduce TN to the new MOE-imposed criteria. The design



concept included the addition of **ECOPOD-N** units from **Delta Environmental** to the existing system to provide tertiary treatment, including further BOD/TSS reduction, nitrification and denitrification. The first unit is operated in an aerobic mode. The second is operated in an anaerobic mode to facilitate denitrification. The third is operated in an

aerobic mode to provide polishing of the effluent. The units are fixed-bed biological reactors. A carbon feed is added to the anaerobic unit to provide a carbon source for the denitrifying bacteria. The system recirculated 100 percent of plant effluent discharging from the ATU units back to the initial anaerobic septic holding tanks.

Result: As a result of a combination of the ECOPOD-N's ability to reduce total nitrogen along with some simple process modifications, test data shows the system is able to consistently reduce TN below the MOE criteria of 5 mg/L. **800/219-9183; www.deltaenvironmental.com.**

CASE STUDY: SYSTEM INSTALLED ON SITE WITH MULTIPLE CONSTRAINTS

Problem: A homeowner in Littleton, New Hampshire, had a failed drainfield that was improperly installed. The property had multiple site constraints, including a close property boundary,

a heavily sloped site, and a rock retaining wall made up of boulders. A system with a reduced footprint was needed to minimize impact and the amount of fill material needed to keep costs down.

Solution: Lynn Mayo of Far North Designs specified the 20-unit **Eljen GSF B43** system. The site had a 12-minutesper-inch perc rate for a four-bedroom home. Schofield's Septic Service installed the system in two leach lines, making the system 41 feet long. Fill material was used to level the system area. The leach-



field is comprised of the GSF units placed on a 12-inch stabilized base of ASTM C-33 sand, and is gravity fed from the existing septic tank.

Result: The homeowner was able to get the new, code-compliant system installed quickly with minimal impact to the site. **800/444-1359; www.eljen.com.**



CASE STUDY: LEACHFIELD SYSTEM SOLVES CHALLENGES FOR MINE FACILITY EXPANSION

Problem: An Indiana coal-mining operation was in need of expanded worker facilities. The presence of disturbed

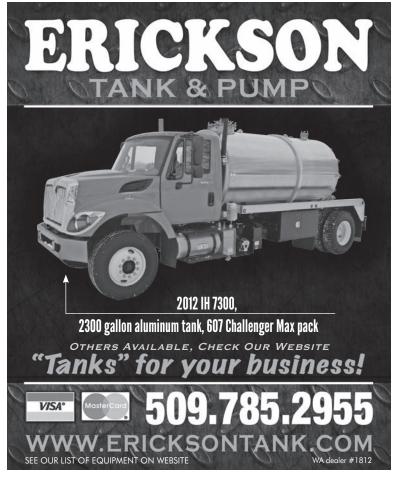
mine spoils, shale and limestone throughout the site made system siting a challenge.

Solution: The design and installation of an **Infiltrator Advanced Treatment Leachfield (ATL)** system reduced the drainfield's footprint by nearly half compared to a stone-and-pipe system. Extensive soils investigation and testing were conducted to locate the 3,150 gpd system over soils without potentially large voids that would allow effluent to migrate into the native soils without proper treatment. The modular geotextile media, sand-lined wastewater treatment and dispersal leachfield system is designed for quick and easy installation, has no moving parts and no venting or additional sand cover requirements.

Result: The system treats the effluent from locker room showers, an administrative office and a machine shop before it enters the disturbed soils. Effluent flows out of the facility via a 4-inch PVC pipe to the first septic tank. It then moves to a pump tank where it is dosed twice daily using on-demand alternating pumps to four ATL beds creating a drainfield. Effluent is absorbed into the underlying native soil. Each zone took two days to install, then was covered with 12 inches of topsoil hauled from another area of the mine and seeded. **800/221-4436**;

www.infiltratorwater.com.







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PRODUCT NEWS



OFFERS CLEAN WATER, SMALL FOOTPRINT AND A RETROFIT TREATMENT SOLUTION

The need for advanced septic systems is on the rise as regulations, varying treatment requirements and failing rural onsite systems necessitate innovation. What are contractors supposed to do when they're faced with a failed system, uncooperative terrain or a lot that's simply too small for a traditional drainfield? That's the question **Green Forward Technologies** CEO Rakesh Govind had in mind when he developed **NextGen Septic.**

The NextGen Septic features a multistage process that uses a combination of conventional anaerobic treatment and aerobic treatment by biofilms. A compartmented tank with a working capacity of 1,509 gallons treats sewage under anoxic conditions to break down solids before moving it to the aerobic stage.

"We expedite the formation of biofilms using specially coated, high-surface-area biomedia," says Govind. "The biofilms are significantly more stable, and they're capable of handling a wide variety of contaminants." The aerobic treatment by biofilms is followed by membrane separation that Govind explains uses proven anti-clog membrane technology.

The final stage is UV disinfection for water that can be reused in toilets or discharged as surface water. NextGen produces effluent that exceeds water-quality standards, Govind says. Since treated water from the system has practically no turbidity, soil clogging is not an issue. Govind says NextGen even helps unclog failed drainfields from legacy systems.

With water that clear, Govind says there are many possibilities for the NextGen system. "It can be used for business and suburban applications, such as office or apartment buildings," he says. "Because the system requires no drainfield, tanks can be placed in out-of-ground locations like rooftops and piped so that water output is used for irrigation or other nonconsumption use."

The NextGen Septic system also has a retrofit option for system repairs. The technology can be added to standard, approved septic tanks. Govind says the system can be used in many situations beyond the traditional rural onsite system.

"This expandable system can be applied across multiple scenarios," he says. "In cases of community development, NextGen has developed a community septic model, which is a hybrid between a packaged treatment plant and an advanced septic tank."

Using a runtime system for its pump, the NextGen operates for less than \$200 per year. A 1,200-volt, single-phase power connection to the home also relays alarm signals for monitoring purposes. The programmable logic controller is also connected to the internet, allowing for remote monitoring. **513/262-9506 www.nextgenseptic.com.**

COXREELS OFFERS NEW OPTIONS FOR V-100 SERIES REEL

The V-100 Series reel from COXREELS features improved O-ring sealing designed for greater vacuum consistency and performance, and a new swivel-retention system that strengthens the frame and prevents separation of the swivel under excessive lateral loading. The new swivel also allows for connecting a 2-inch hose in addition to the 1.5-inch hose, making the reel more accessible for home and light commercial applications. The V-100 Series is available in either a 35- or 50-foot model. 800/269-7335; www.coxreels.com.



WATER CANNON POLY DRIVE CLEANING MACHINES

The Poly Drive twin-cylinder pressure washer from

Water Cannon features a Honda GX 690 engine and industrial-duty General Pump TSP Series pump. The result is 6,000 psi of power for commercial and industrial cleaning applications. The units are also equipped with a Gates Poly Drive long-life belt system that is laser aligned. Standard accessories include a 50-foot pressure washer hose with quick couplers for continuous washing, four quick-connect spray tips, aluminum frame, safety belt guard and a high-rated trigger gun and wand. 800/333-9274; www.watercannon.com.

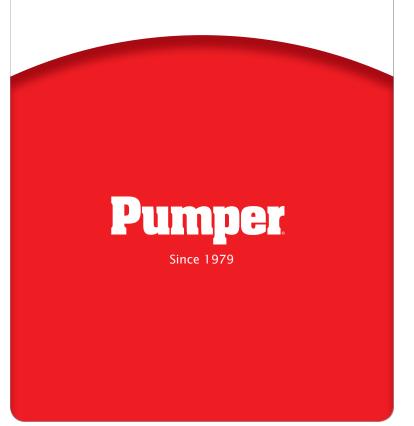
OXFORD PLASTICS TEMPFENCE

Oxford Plastics collaborates with fence contractors to manufacture products for the temporary fence industry. BigFoot Fence Weights offer an alternative to sandbags, OxBlock HiVis are an alternative to concrete feet, and the OxStand provides an alternative to tube stands. All are designed to provide safe alternatives to traditional temporary fencing. Oxford Plastics also offers EnduraMat ground covers, a range of barriers, trench covers and composite modular road plates. 800/567-9182; www.oxford-tempfence.com.



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INDUSTRY NEWS

Ledwell 70th anniversary

Ledwell & Son Enterprises celebrated 70 years of manufacturing trailer and truck bodies in 2016. A few operational features of Ledwell vacuum trucks and trailers are: ASME/DOT 412, multicompartment tanks; hydraulically



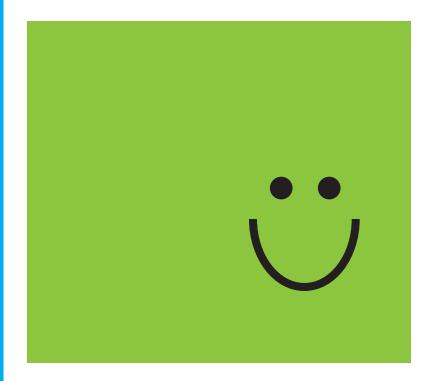
operated front hoists and full-opening rear doors; Liquid Ring technology; and continuous-duty vacuum pumps with auxiliary off-loading capability.

Muncie Power Products M-Power Tech available in Spanish

Muncie Power Products announced that its online power take-off and mobile hydraulic system training program, M-Power Tech, is now available in Spanish. M-Power Tech users can access the online program from anywhere and complete lessons at their own pace.

Continental plant honored with Ambassador of Energy Efficiency award

Continental ContiTech's St. Marys, Ohio, plant received the Ambassador of Energy Efficiency award from Efficiency Smart, a Columbus-based company that assists businesses with implementing energy-efficient products and services. The plant replaced metal halide lights in its facility with high-performance T8s and installed LED wall-packs and floodlights.





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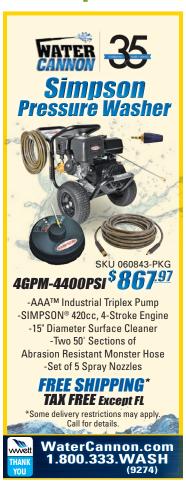


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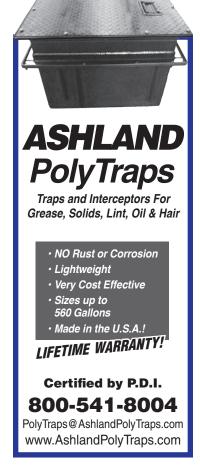




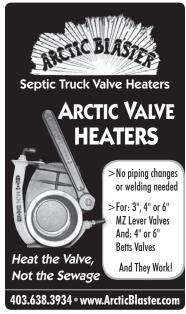
















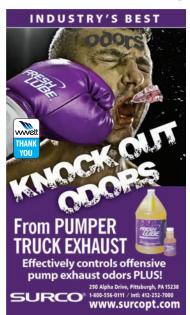
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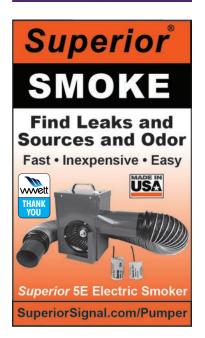
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BUSINESSES

Septic Tank Cleaning & Inspection Service Business for Sale in Central Maine. Owner is retiring and is motivated to sell. Profitable (Average 3-yr Gross \$205K), turnkey business with 5,200 loyal customer base. Two pump truck operation – (1) 2000 GMC - 2,500-gallon capacity. (1) 2004 Peterbilt – 4,500-gallon capacity. Serious inquiries only! Email septicbizsale@gmail.com or call 207-782-1620 (PBM)

For Sale: Very reputable portable restroom company of 25 years. Main office in Edinburg/McCook, TX and yards in Cotulla, TX and Cuero, TX. For more information, price and what's included, please call 956-842-3603. Sale due to owner's retiring. (P04)

Septic Tank Pumping Business, Central North Carolina. Excellent income. Two (2) pump trucks, excellent condition. Owners retiring. Willing to train new owners. \$250,000 firm. Also available: 3-bedroom house with large lot. Contact arlnjss@yahoo.com (P03)

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Florida septic business for sale with two trucks and all equipment. Established 36 years. Specializing in drainfields, tank installations and repairs. \$289,000 negotiable. Commercially-zoned house & office available for an additional \$130,000. Serious inquiries only. Call for more info. 727-326-5044. (P06)

Municipal & Residential Sewer/Septic Company for sale in Conroe, TX, which is on the north side of Houston. 1.7 acres unrestricted zoning, 3,000 sq. ft. of buildings, bunk house, office, work shop with 14' doors, billboard. 2014 3-bedroom, double-wide mobile home. (3) Vactors, (2) Aries cameras, commercial septic truck with hoist & rear door. Services include: municipal sewer line cleaning & televising, root cutting, manhole inspection & repair, lift station cleaning, septic pumping, smoke testing. \$579,000. Contact Ben 952-994-1117.

Septic Business for sale in central Florida, truck and equipment, 40+ yrs., same phone # 352-429-2426. \$250,000. Email tcraigseptic@gmail.com (P05)

Portable Restroom Business for Sale in Midcoast Maine. Loyal customer base for 20 years. Event, contractor, sinks, 12-place trailer, 400/700 Imperial Industries tank on an F-550. Serious inquiries only. \$125,000. portabizsale@gmail.com or 207-449-8741. (P04)

wind river environmental is actively seeking opportunities to acquire companies in the septic, grease, waste hauling, drain cleaning and commercial plumbing service lines on the East Coast. Join a winning team! Check us out at www.wrenvironmental.com. Email Dave@Klinesservices.com or call my cell at 717-587-1909. (P04)

Looking to start your own septic tank business in Florida? I can help. Have license, will sponsor. Call 931-277-5541 or 931-248-1284. (PBM)

National Grease Recycling Inc. Let us teach you how to recycle restaurant's waste, fryer grease and oil (yellow grease) only. Big \$. Over 30 years experience, will guide you through complete process from collection to processing to marketing to end users. Don't lose your trap business to competitors that offer both services. We also buy cooking oil, unprocessed, anywhere in the country. Call for information. References available - many success stories. Dewey Walker, 813-704-6599 or 813-758-2552. (PBM)

COMPUTER SOFTWARE

FreeServiceReminderSoftware.com, FreeServiceDispatchSoftware.com, FreeRouteManagementSoftware.com. (PO3)

DEWATERING

Portable septic and grease receiving stations, dual-screen design. Screens that really work - simple, non-mechanical. Set it up anywhere. 208-790-8770 screencosystems.com sales@screencosystems.com (PBM)

Dewatering Solids Units. 1. Hycor Roto Strainer Screen for removal of core solids. It is stainless steel, 4 ft. long and comes with 20,000 wedge wire screen plus a hydroscreen. Asking \$10,000. 2. Roto Strainer Screen. It is stainless steel, 8 ft. long and comes with hydroscreen. \$25,000. Please contact 734-722-8922. (P03)

DRAIN/SEWER CLEANING EQUIPMENT

2014 Bullfrog Industries Crapshooter: 1,500 psi, 1.65gpm suitcase jetter unit with 100' and 50' jetter hose. Barely used. \$950 OBO. 717-738-2149 (P03)

DRAINFIELD RESTORATION

Terralifts - New and Used. Financing available for qualified buyers. For more information call Dick Crane 800-223-2256 or aalco@tds.net for electronic brochure. www.youtube.com/watch?v=t8ApRUOasnY (PBM)

Small septic company looking for a Terralift machine in good condition. Please contact Tim at 804-539-5657 with available equipment. (P03)

New and used terralifts for sale starting at \$20,000 used and \$38,000 new. Financing available. Call John at AerraTech 413-298-4272. (PBM)

HAZARDOUS WASTE UNITS



2005 Sterling/Presvac PowerVac, stainless steel, DOT certified, 3,500-gallon wet/dry. Dump door with high rail gear and boom, Hibon 27" blower with PV750 vacuum loading offloading pump. Tri-axle truck with CAT 435hp engine with Fuller 8-speed transmission. Runs excellent.

KLM Companies 617-909-9044

PBM



Pre-owned 2016 Presvac 5,500 U.S. gallon, carbon steel, D.O.T. 412 (A.S.M.E.) vacuum tanker with a hydraulic-driven Fruitland RCF500 pump. (Stock# 5002C)

www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) PBM



Pre-owned 2,300 U.S. gallon, carbon steel, D.O.T. certified, vacuum pressure tank. Mounted on 2002 International cab and chassis with a Presvac PV750 vacuum pressure pump. (Stock# 0529V)

www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) PBM



Pre-owned 2,300 U.S. gallon, carbon steel, DOT certified, vacuum pressure tank. Mounted on 2000 International cab and chassis with a Presvac PV750 vacuum pressure pump. (Stock# 4509V)

www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) PBM



New 3,200 U.S. gallon, carbon steel, DOT certified, 407/412 vacuum tank, dump type with full open rear, door and a Presvac PVB 750 vacuum-pressure pump installed on a 2016 Peterbilt 348 cab and chassis. Four (4) units available.

www.VacuumSalesInc.com (888) VAC-UNIT (822-8648)

1998 King Vac, 1998 Mack RD688, 300 Mack, 3,000-gallon tank w/recent inspection. \$49,000. Call 713-206-2540 (P04)



1998 King Vac, 1998 Ford L8T, 8.3-liter Cummins, 3,000-gallon tank replaced 4/2012. \$79,900

800-535-8606, OH

P03

JET VACS



2000 Mack Vac-Con RD688S T/A 350hp, Maxitorque T21130 13-speed, Camelback suspension, 270-inch WB. Vac-Con V312SHCE tank, rear gate, hoist, silver face heater, Cummins 4-cyl. aux., 60,013 miles. 3,000/6,000-watt inverter. Unit has hot water to steam, jetters, LED worklight and backup light. Main 7,068 hours, Auxiliary 2,714 hours. \$65,000 Delivered to Port of Tacoma, Washington. Currently located in Alaska.

907-398-5263, AK mattletzring@gmail.com $$_{\rm P03}$$



2015 Camel Western Star 1200 combo truck, 824 blower, ejector plate, 12-yd. debris tank, 80gpm @ 2,000psi water system, 1,500-gallon freshwater, 600' of 1" jet hose. Front pump-off system. Low hours and miles. Call for more information and pricing.

Jay 317-769-2777, IN PO4



2015 Freightliner Camel combo truck, 824 blower, ejector plate, 12-yd. debris tank, 80gpm at 2,000psi, 1,500-gallon freshwater, 600' of 1" jet hose. Low hours and miles. Front pump-off system. Call for more information and price.

Jay 317-769-2777, IN PO4



Call John 503-887-0070 PBM



1995 Ford L8000 Vactor 2115: 80gpm @ 2,000psi, 120,773 miles, 9,226 pony motor hours. New: Fan blades and clutch, rodder pump, hose reel bearing and lock. Tires are between 50-100%. .. \$48,000

Call Josh 952-873-3292, MN P03

Vac-Con industrial machine mounted on a pre-owned 2006 Sterling cab and chassis. (Stock #8593C) www.VacuumSalesinc. com (888) VAC-UNIT (822-8648) (PBM)

Vac-Con V390LHA combination unit with Roots 827 blower, 1999 International Model 2554 cab and chassis. (Stock #3918C) www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648) (PBM)

Jack Doheny Supplies Inc. offers a full range of late model combo units and DOT industrial vacuum loaders. Call us @1-800-3DOHENY.

1998 Vactor 2100: 162,129 miles, 9,336 hours. Cummins C8 drive motor. Cummins 5.9 pony motor. \$47,000. 408-377-2793 (P03)

JETTERS-TRAILER

O'Brien trailer jet, 30gpm, 3/4" hose, Wisconsin engine. Hose and fuel tank needs to be cleaned, but runs and works. Comes with root saw. \$3,000 OBO. 715-533-2262 (P04)

Trailer Jet SRECO 2004, 4-cylinder Ford - gas, Myers-35-20 pump, 750-gallon poly tank. Very good condition. \$11,750 OBO. tpm.markey@gmail.com or call 734-365-4035 (P04)



Xtreme Flow Trailer Jetter Hot/Cold! Model# HJ2TA8536, tandem axle trailer, 35 hp Vanguard 10 gpm @ 3,850 psi, 325-gallon water tank, 300' hose, General pump. **Fully loaded!** List \$36,995. On sale for \$32,995.

800-213-3272, www.hotietusa.com

PRM



330-231-5943, OH

Pre-owned 2007 PipeHunter trailer-mounted jetting unit Model 38T44.4,000psi @ 25gpm w/335 U.S. gallon water tank. (Stock# 4313V) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)

SECA 900-gallon fiberglass tank, Myers D65-20 pump, 6-cylinder Perkins diesel, 1-inch hose, low hours. Nice machine. \$14,400 OBO. 734-365-4035 (P04)

JETTERS-TRUCK



608-835-7767. WI

1975 Ford F-700: 5-speed, 35,000 miles. Hydraulic brakes. Non CDL. No a/c. O'Brien jet ran by Ford pony motor. 600' reel, 60gpm at 2,000psi. 1,000-gallon water tank. Runs and jets good. \$7,500. Call 706-798-8080 (P03)



1990 International 4700, DT466, 5-speed, 158,000 miles, hydraulic brakes, under CDL. 1,500-gallon stainless tank, 65gpm Myers pump, Ford power unit with recent long block. \$19,500. Also have 0'Brien trailer jet - \$3,000.

715-533-2262. WI

262, WI P03

Myers Ram jet, 1986 Ford F-700 Ford diesel, Myers D65-20 pump. 500-ft of 1-inch hose. 70,000-miles. Like new. \$14,500 OBO. 734-365-4035 (P04)

Vactor 850, 1984 GMC 8.2 diesel. 600 feet of 1-inch hose. Tank needs repair. \$4,500 OBO. 734-365-4035 (P04)

LEASE/FINANCING

Western Equipment Finance, a bankowned direct lender, is committed to continuing to help you prosper. All equipment types, new or used; we have the best rates and terms you deserve. App-Only Financing and credit decisions within an hour. Call the team you can trust, Jim Stekl at Western Equipment Finance 701-665-1647. jim.stekl@westernequipmentfinance.com (PBM)

Quick and easy financing for new or used equipment — without all the headaches. **Credit is not an issue.** We have working capital available for commercial equipment purchases \$20,000 to \$2,000,000. **BSG Services** - Call 866-259-5370 or email bsgfin@earthlink.net (PBM)

MISCELLANEOUS

Selling septic trucks and a septic tank stake truck with 16-unit carry capacity - \$12,000. 300-gallon slide-in septic tank for a pickup - \$1,500. 3,000-gallon septic International truck - \$15,000. GMC TopKick with 700-gallon capacity tank - \$5,000. 1,100-gallon capacity septic truck - \$15,000. Location: Brighton, Michigan. Call 810-217-4639, ask for Bart. (P03)

31 cases of alcohol-free foaming hand sanitizer Betco Clario 77829-00 with 48 black dispensers. 17 cases of Gel-Rite gel hand sanitizer. Derma Rite 00100BB. Also EZ Foam dispensers, 24 total. 419-865-4830 (P03)

Submit your classified ad online! www.pumper.com/classifieds/place_ad

PORTABLE RESTROOMS



(26) ADAs, (12) Double-basin Sinks, (10) Double Trailers: Currently selling 26 Five Peaks Matterhorn handicap ADA units. 12 PolyJohn Applause double-basin sinks and 10 PolyJohn double field trailers (holds 2 standard units). Asking prices: ADAs - \$600 each; Sinks - \$250 each; Trailers - \$800 each. Call or email for more information:

217-239-5646, IL P03 ipt-info@gullifordservices.com

20 used portable restrooms. Blue with vellow tops. \$199 each. Scott Williams 706-832-5224 (P03)

PORTABLE RESTROOM TANKS

FOR SALE: (21) PolyJohn 250-gallon, lowprofile holding tanks. \$250 each. Call 956-842-3603.

PORTABLE RESTROOM TRAILERS

2 Decons, 28' Tonto, 18' Royal, 2001 ASCI, 16' Presidential, 26' Presidential, portable toilet hauler trailers. 315-437-1291, NY. (PBM)

2011 Optimum 28 Portable Restroom Trailer: 9/2 restroom trailer. Great for male-dominant site. Large waste tank with hot-water heater. Arctic package for extreme cold temps. In great shape and ready for work. \$35,000. 435-896-9212

24' Olympic portable restroom trailer for sale. 5 stalls, 3 urinals, 2 sinks. \$12,000. Call 844-274-7464.

1990 Olympic 10-station restroom trailer, 24'. Women's 4 stalls, Men's 2 stalls/4 urinals. New exterior paint. North East, MD. \$7,800. Contact Robert @ 443-553-1517; Robert@regalrestroomsllc.com (P03)

PORTABLE RESTROOM TRUCKS

2001 Ford F650: Cummins engine, Allison auto, transmission, a/c, 280k miles, Prime industrial 700 waste/400 water, Masport HXL4 pump. No winters. \$29,000. More info/questions call Jim 231-690-2964 no text. (P03)



Complete Portable Toilet service truck mount units (turn-key), mounted on your truck or ours. Tool boxes, dual work stations, dc10 washdown pump, reversible vacuum pump, hose reel, set up complete, toilet racks available. 1100 waste/400 fresh: \$21,000, 1700 waste/600 fresh: \$23,500. Anv custom options or sizes available!

> **TexLa Services** 936-641-3938 www.texlaservices.com P03



For Sale: 2006 International 4300 toilet truck & tank. DT466 engine, Allison auto. transmission, a/c, air brakes, air-ride drivers seat. Abernethy unit 700-300 tank, Masport HXL75 pump, dual side service, 2-toilet carrier. With pressure from truck can use vacuum on waste & freshwater. In good condition, no CDL needed. \$30,000 negotiable

410-239-1228

P03



2006 International City Freight 500: 6-cylinder diesel, 93,000 original miles, auto transmission. Stainless tank built in 2013, Conde pump electric start Honda, pail dump & water pump, 6-unit carrier with liftgate, 60 inch & 32 inch aluminum tool boxes with stainless doors. Tires are 80%, trailer hitch. Truck is ready to work!

Call 989-284-9193, MI

2002 Isuzu FTR: Allison auto., air brakes, air-conditioning, under CDL. 1,100-gallon sludge/400-gallon water. Keith Huber Princess II. \$22,900. 401-663-1002



2007 Freightliner M2106: Mercedes engine, automatic, air brakes, 309,778 miles. 1.500/500 aluminum tank. Masport HXL4V. Dual side service, 2-unit carrier. Under CDL. \$38,000

> **Call or text Bill** 614-496-5571, OH



2007 Ford F550 diesel 137,503 miles, Keith Huber body 750/350, dual side service, 2-unit carrier. \$28,000

> **Call or text Bill** 614-496-5571. OH

P03



2007 International 4300, engine overhaul at 250,000 miles. Restroom servicing. 500 freshwater/1,000 waste. PTO pump. Call or text for more info. \$19,999

949-244-8698, CA

2012 Isuzu NQR diesel, automatic, 900/300 aluminum tank, Masport pump, two-unit carrier, 141,000 miles. \$36,000 OBO. Call 845-883-7880.

2007 Isuzu NPR: 600-gallon waste compartment. 350-gallon freshwater compartment. 60 cubic feet of dry storage space. 108,000 miles. Can transport 4 portable restrooms. \$18,000. For more information please contact rauny@theinet.com

2008 Isuzu NPRHD: Crescent flat tank, 6-unit carrier,120,000 miles, diesel/automatic/exhaust brake. Thieman liftgate, 550w/250f, Masport pump. Dual side service, work lights. Serviced every 5,000 miles. Clean truck. \$39,000 OBO. Call 203-748-6906.

2000 Isuzu NQR: Automatic transmission, rebuilt motor. 450,000 miles. 750-gallon - 500 waste, 250 water. Call 800-461-0032 for pictures or further info.



2007 International 4300: DT466, automatic, air breaks,283k miles. 1,500-gal-Ion tank (1,100 waste, 400 fresh) Rebuilt engine 2014, rebuilt transmission 2015. Asking \$29,000

> **Call Mike or Josh** 901-452-7040, TN

P03



1996 International 4700 LP, holds 500 gallons wastewater and 250 gallons freshwater. \$10,000

Call 724-947-9008, PA



1999 International 4700 LP pumper, holds 500 gallons wastewater and 250 gallons freshwater. \$10,000

Call 724-947-9008. PA

2007 Ford F550 4x4: New 11' flatbed, new 800-gallon portable toilet slide-in tank -540/260. Conde Super 6, 70cfm, 5.5hp electric start Honda. Bucket fill, 30' Tiger Tail. Ready to work. \$27,995. Denver CO. 303-789-9440 Ask for Matt. (PBM)

2006 Ford F550 4x4: New 11' flatbed, new 950-gallon portable toilet slide-in tank -650/300. Conde SDS6, 9hp electric start Honda, Bucket fill, 30' Tiger Tail, Ready to work, \$29.995. Denver, CO. 303-789-9440 Ask for Matt. (PBM)

2007 International 4300 1,350-gallon \$39,500; 2006 International 4300 1,350-gallon \$37,500; 2002 International 4300 1,350-gallon \$21,000. 256-757-9900 or www.pbsos.com (PBM)

 $\begin{tabular}{ll} \textbf{myerssepticservicellc@gmail.com} \\ \textbf{715-874-5274, Wl} \\ & P05 \end{tabular}$



2012 Mitsubishi Fuso: 3.0-liter turbo diesel, 123,563 miles. 300/150 Imperial steel tank, Honda GX240 8.0 motor. Carries 6 with gate up, 8 with gate down. \$30,000

office@johnnypotty.com 574-896-5424, IN

2007 Ford F550: diesel, auto, fresh rebuild on engine with warranty. 600w/300f stainless steel vacuum tank, Masport pump. www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PBM)

2009 Dodge 5500: 6.7 Cummins diesel, auto., 4x4, new aluminum vacuum tank, 700w/200f, Masport pump. Honda engine. www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PBM)

2005 Chevy Kodiak 4500: Duramax diesel, auto., 4x4, 13-ft flatbed, 52,000 miles. Like-new. \$35,000. Vacuum tank & pump can be added for additional cost. www. pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PBM)

PORTABLE SHOWER TRAILERS

Attention large outdoor events promoters and seasonal campgrounds requiring showers, sinks and hot water availability: **FOR SALE**: Two (2) 40-ft. shower containers. 14 shower heads per container, handicap accessible. Trailer and accessories included. For pictures go to www.candsshowers.com. 712-428-6143 or cell 712-880-1250. (PBM)

Submit your classified ad online! www.pumper.com/classifieds/place ad

POSITIONS AVAILABLE

DISPATCH MANAGER PROFESSIONAL: Growing portable toilet company in Akron, Ohio looking for an experienced Dispatch Manager. Must have at least 5 years experience, strong customer service skills, must be versed on the latest technology and have excellent communication skills. We offer top pay, benefits, company match retirement plan, new state-of-the-art facility for a comfortable working environment. Will assist with moving expenses. Serious candidates please send resume to: pflynn@superiorportables.com (P03)

GapVax, Inc., a nationally recognized manufacturing business, is seeking a talented, highly motivated individual to fill a full-time Sales Position in the Midwest (lowa based preferred) region. GapVax is the leading manufacturer of industrial and municipal vacuum units and hydroexcavation units in the United States. We provide the most reliable, comprehensive, and efficient mobile vacuum units in the industrial and municipal markets. Specifications of the position are listed on our website, www. gapyax.com, click on the Now Hiring link in the left hand column. Send resumes to or betty@gapvax.com or 575 Central Avenue, Johnstown, PA 15902. (PBM)

PRESSURE WASHERS

Industrial Pressure Washer - New w/warranty \$9,500. 2,000psi, 18gpm. 999cc Kohler & AR pump. Will deliver. 321-800-5763 (PBM)

Honda horizontal GX engines, new in-the-box w/warranty. GX200QX - \$399; GX270QAG -\$579; GX390QA - \$599 delivered price. 800-363-9855 or GXParts.com (PBM)

PUMPS

Buy & Sell all makes and models, new & used vacuum pumps & high pressure water pumps, and good used replacement parts. Call for an inventory sheet and save. www.Vacuum SalesInc.com, (888) VAC-UNIT (822-8648)

2 New Goulds submersible lift pumps, Model# WS 5012 D4, 5hp, 230-volt single phase, 3" discharge. \$2,500 each. Call 419-358-1936. (P03)

For Sale: Two (2) Myers M1610K40 – pumps only. www.waterjettingequipment.com or phone 714-259-7700. (PBM)

RENTAL EQUIPMENT

Liquid vacs, wet/dry industrial vacs, combination jetter/vacs, vacuum street sweeper & catch basin cleaner, truck & trailer mounted jetters. All available for daily, weekly, monthly, and yearly rentals. VSI Rentals, LLC, (888) VAC-UNIT (822-8648) www.vsirentalslic.com

2016 Acro Vacuum Trailer: Stainless steel 6,000 gallon, DOT certified double conical with air-ride suspension. Aluminum wheels all positions, full hose trays, OSHA walkways and railings. Vacuum pump option either hydraulic or self-contained. KLM Rentals, Inc. 617-909-9044 (PBM)

SEPTIC TRUCKS



Dave 724-747-3229, PA



> 248-431-5899, MI davidjanette@comcast.net P03



2013 Kenworth T-800: Loaded. 5,000-gallon steel tank, D-Mag 800cfm jetter. Ready to work. 210,000 miles. \$130,000

Call 850-902-9044, FL PO



> Call 810-614-9141 or 586-996-5552, MI



2003 Peterbilt 379, C15 Caterpillar with 335,000 miles, Eaton-Fuller. Double frame, big rear end, dual stacks, drop visor. Karymore 5,100-gallon aluminum tank with Masport HXD 400W pump. Woodgrain dash, cloth seats. \$85,000. 2000 Peterbilt 379, C15 Caterpillar, 221,000 miles in-frame done less than 10,000 miles ago. Eaton-Fuller, double frame, big rear end. Karymore 5,100-gallon aluminum tank. Jurop pump just rebuilt. \$65,000.

386-672-1576, FL

P03



804-895-6355, VA



715-234-6325, WI



2005 Mack: 677k miles, AC310/330hp diesel, 4,000-gallon tank.

Andrew 561-302-7195, FL Andrew@raiderrooter.com P04

SEPTIC TRUCKS



2003 Sterling Keith Huber Dominator 3.000 waste/300 fresh is for sale. Fleetmaintained and 173,000 miles. We are painting the truck now (white) and line-X. We upgraded to a new unit and this is is still bulletproof. 440cfm hydraulic vac pump with dump bed and rear-opening door. You can drive it anywhere. No oil leaks, runs perfect. 68mph top speed. \$58,000

678-906-0712, GA



2011 International DuraStar: 33,000 GVW, 6-speed, 100,000 low miles. 2,500-gallon Progress aluminum tank. Also 100-gallon tank for PTO-powered ietter w/electric reel. \$61.500

765-744-0862, IN



2002 International 4400: DT466, 269,000 miles, Allison 3060P. 2,400-gallon Jay's hoisted tank (steel), 747 National Vacuum blower, air push axle.\$35,000

218-744-4443, MN



1993 International 4700 single-axle bobtail vac truck. 280,000 miles, runs great. 1,200-gallon tank, new pump on truck and also comes with a backup pump that needs to be refreshed. \$15,000

> Call 701-340-7780. ND a1evans@srt.com



Turn-Key Vacuum Tank Units: 3,600gallon, unit mounted on your truck or ours; \$23,500. 2,500-gallon truck units; \$20,000. 1,500-gallon truck units; \$17,000. Self-contained vacuum skids, 1,000-gallon; \$11,000. 2,500-gallon painted tanks ready to mount; \$13,000. PortaPotty trucks and any custom options or sizes available!

> **TexLa Services** 936-641-3938 P03

www.texlaservices.com



2005 International 4400: Original owner, 132,500 miles, clean (garaged), Masport HXL400WV, 7-speed manual, new clutch 12/15, 2,300-gallon aluminum tank, 50-gallon freshwater tank. Looks great, runs and pumps with ease.\$58,500

> **Scott's Enterprises** 989-275-5011, MI



2007 Freightliner: 60-Series Detroit, 455 horsepower. Only 117k miles! 10-speed transmission, a/c, jake. New 3.500-gallon tank with stainless steel hose trays and aluminum on sides. Fruitland 500 vacuum pump--used very little. New stear tires and paint. This truck is in excellent shape. \$57,000

> 740-259-5555. OH P03

1997 AutoCar/Volvo: Cummins N14 525hp engine, Eaton 8LL 10-speed transmission. 2009 PikRite 5,000-gallon vacuum tank with Presvac LPK vac pump. Excellent running condition, \$36,500, Used Presvac PV750 vac pump for sale, recently overhauled. \$2,500. Contact Frank@ActionKingServices. com or 978-452-7750.



1993 Peterbilt 377: 3,600-gallon tank, new pump. Ready to drive anywhere. \$35,000

276-620-0533, VA r_rseptic@yahoo.com

P03



2006 International with 1992 Keith Huber Dominator. Truck has 295,980 miles on it; tank has original identification plate. Asking \$37,500

Danny 228-832-5600, MS P03



1996 Kenworth T800: Cummins M11, 370hp, 10-speed RoadRanger. 18k fronts, 44k rears, air bag suspension. 3,500-gallon tank, 367 Challenger pump. 3" valve, 4" valve, 6" dump. Heated valves. \$35,000

Squires, Pierson and Sons, Inc. 631-283-1403, NY



2005 Kenworth T800 pump truck: 184k miles, C13 motor, 10-speed. 4,000-gallon tank, full-hoist, rear-opening door, vibrator. Transway 1200 air-cooled pump, high-pressure jet with 75-gallon water tank. Vacuum pump recently rebuilt.\$115,000 OBO

802-658-6243, VT



2005 Kenworth T800: C15 motor. 210.000 miles, 10-speed, 4,000-gallon waste, 200-gallon freshwater. Transway 1200 pump. High-pressure jet, full-open rear door, hoist and vibrator. New tires.\$125,000 OBO

802-658-6243. VT

P03

P03

1997 Freightliner FL70: 8.3 Cummins, 145.000 miles.2003 Imperial 2,500-gallon tank, 367 Challenger pump, heated valves. \$26,000

Call 507-867-1666, MN



1996 International pump truck with new 3.600-gallon Abernethy tank, M-11 strong 9-speed, a/c, new tires R-260. North Florida \$45,000 firm

William 850-902-9044

1986 GMC General, tandem axle, 350 Big Cam Cummins, 15-speed Fuller transmission. 800,000 miles, engine rebuilt at 600,000 miles. 4,000-gallon tank w/rebuilt Jurop R260 pump. \$11,000. 719-576-7707. (P03)

2001 Sterling Acterra: Good starter or backup truck. 340k on truck, 100k on engine. Needs minor repairs, nothing major. Runs/ pumps great everyday. \$32,500. Call/text 859-621-6526.

LIST YOUR EQUIPMENT FOR SALE ONLINE at www.pumper.com



2002 Mack: Tank freshly painted, aluminum freshly polished, liquid-cooled Jurop pump, cold AC, good rubber, brand new brakes, aluminum wheels. This truck is ready to go make money. ..\$52,000 OBO

Darla 352-317-2527. FL



2007 International tandem-axle septic truck, 3.500-gallon aluminium tank, Masport 400 water-cooled pump. 10speed Eaton automatic transmission, 235,383 miles. \$82,500

> **Call Rodney Lane** 270-832-3793

P03



1999 Volvo: 400hp Cummins, Transway 3,800-gallon tank. New Fruitland pump March 2015, hoist just rebuilt. New transmission, 60k miles... \$40,000

Mike 443-235-5979, DE



2006 Sterling, 460 horsepower Mercedes, 265k miles, 10-speed transmission, a/c, cruise, jake. Newer 4,200-gallon tank - lined inside and used very little. Fruitland 500 vacuum pump. 20k lift. New tires and aluminum wheels. Very clean, low-mile truck. \$55,000

740-820-5520, OH



2003 Peterbilt: 330hp Cummins, Allison automatic transmission, 207,465 miles. Air-ride chassis/seats, singleaxle, 2,800-gallon TST aluminum tank. 4" & 6" heated valves, 6" air-operated from cab/rear. Masport 400 pump. 50-gallon freshwater tank, hose reel. Tires like-new w/aluminum wheels, toolbox. Always kept inside, excellent condition. Asking \$55,000

myerssepticservicellc@gmail.com 715-874-5274, WI



2001 Sterling Acterra: 2,800-gallon Progress aluminum tank, Caterpillar 3126 engine with 200,000 miles, rebuilt Spicer 7-speed transmission, NVE pump...... \$32,500

704-562-3523, SC

Five (5) older pump trucks with full-opening rear doors for sale. All are in good shape and work daily. 3,000 to 3,600 gallons with large Jurop pumps. Contact Joe Waters @ 775-691-1403.

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2006 Kenworth T800 EXT Cab. C15 CAT, 18-speed. Aluminum 4,500-gallon tank. Wittig pump. Hauled only freshwater. 228,000 miles. \$75,000

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1996 Western Star: Detroit Series 60. 18-speed transmission. Hendricks suspension. 3,365-gallon vacuum tank, Masport 400 pump. www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PRM)

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814-277-6227, PA

P03

P03



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P03

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2010 Acro 6,000-gallon vacuum trailer, 2002 Mack CH tractor. 264,000 miles, 427hp, 13-speed. 14,500 lb. front, 44,000 lb. rear, air ride. \$60,000

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2004 F550 stake truck: Holds 7 toilets with Tommy lift and Imperial tank behind cab. 157k miles. \$16,500. Pictures upon request beckpar@yahoo.com or call Paul at 715-927-7290.





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