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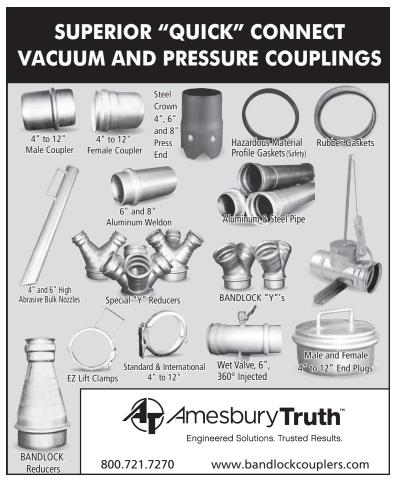


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Contact Jim with your comments, questions and opinions at editor@pumper.com.

Many Pumpers Face a Dumping Dilemma

Talk of restricted access to disposal and unpredictable rate increases at municipal treatment plants cause great uncertainty for haulers By Jim Kneiszel, Editor

ocal municipal treatment plant officials are making noises that they will no longer be able to accept your septage loads. They say they've reached treatment capacity or the cost of processing loads from pumpers is becoming burdensome to the taxpayers. They talk about drastically raising the rates, or maybe taking only sludge pumped from homes and businesses within their city, town or county boundaries.

This is becoming an all-too-common problem in the pumping industry, especially in sprawling metropolitan areas where municipal wastewater plants face budgetary constraints at the same time as more new homes are relying on septic systems for treatment. On one hand, officials look for ways to limit incoming septic waste. But on the other hand, some accommodation is needed for the growing number of residents not hooked up to the Big Pipe.

Officials are looking for solutions and turn to you — one of their biggest pumper customers — for your thoughts. What do you tell them? If you're Frank Bowen, of Bowen's Septic and Environmental Services in Conyers, Georgia, you wrestle with the question that has been dogging you as some plants turn away your trucks and others jack up their prices.

TOUGH NEWS

Bowen was invited to a meeting of the Rockdale County Water and Sewage Authority to hear that monthly septic dumping in early 2016 more than quadrupled. If the pace continues, a plant operator said the county would blow out its budget for sludge treatment.

"It is something that needs to be dealt with, and I think we need to find the path forward that is equitable for the residents of Rockdale County," said Ed Biskis, of ESG Operations, which maintains the county water and wastewater plants, "and for the vendors who are trying to provide that service to the residents who need their septic tanks pumped."

As reported in the local *Rockdale Citizen*, officials around the table discussed ideas like requiring mandatory

Give me a place to dump and I'll (pass the costs along to) the customer. You just tell me what it costs, give me a safe place to dump and we'll keep rocking and rolling. ")

Frank Bowen

three- to five-year pumpouts to reduce the strength of the sludge taken from neglected septic tanks. They determined it would be hard to put that requirement in place and challenging to regulate required maintenance.

Bowen suggested a consumer education effort as a starting point.

"What is happening is that a lot of people who have been on public sewer their whole life are moving into Rockdale County. They flush every cotton-picking thing they can think of down garbage disposals," Bowen said. "There have been times when we could literally walk on the sewage."

EDUCATE CUSTOMERS

I called Bowen and asked him to elaborate on his thoughts following the meeting and talk about his frustration over a scarcity of dumping options. He said the situation could threaten the livelihood of his company with 15 workers, as well as all the other pumping companies who rely on area treatment plants.

Maintenance is clearly a growing issue and one part of the problem, he explains. His technicians often encounter what he calls "dead tanks," septic tanks overwhelmed by grease, trash that shouldn't be flushed, and harsh cleaning products. The systems have been neglected for many years and are so packed full that workers use a mini-excavator bucket to start clearing the waste away before pumping.

The drivers try to educate homeowners about proper septic system care, and add notes to the invoices spelling out necessary lifestyle changes needed to correct a problem.

"It's out of sight, out of mind. Once we pull out of the driveway, all that's forgotten until it starts to back up in their house again," he says. Those homeowners call after six months, angry that their lines have backed up again. "They'll magically remember when you show them the notes on the invoice."

While educating septic users is a great idea, Bowen implores treatment plants to set disposal prices that pay for their costs — and a little bit more — rather than threaten to restrict or ban pumpers from using these facilities. Banning septic sludge is failing to serve the 55 percent of county residents who utilize septic systems, he says.

COSTS ARE RISING

Currently Bowen pays \$500 to dump a 3,500- to 4,000-gallon load at Rockville County. If the price has to rise to cover the treatment plant costs, so be it, he says.

"If it costs \$600, go to \$600. If it costs \$700, go to \$700. Give me some figures and let's fix the problem," he says. "Give me a place to dump and I'll (pass the costs along to) the customer. You just tell me what it costs, give me a safe place to dump and we'll keep rocking and rolling."

Bowen didn't get an answer to his question about cost, but he views the situation as an opportunity for a public treatment plant, or maybe it will fall to the private sector to step in and handle the load.

(continued)

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"Surely they can figure out how to design a treatment plant to handle the sewage," he says.

Bowen doesn't want to discount the impact raising dumping prices will have on his business. Constant increases have already taken their toll. He says the going rate for a pumpout is \$375 in his area, which means he can take in \$1,125 filling a truck in three stops. When he spends \$500 to dump, \$100 for fuel, about \$275 for labor, the profit is down to \$250, and out of that comes equipment wear and tear, office staff, insurance and advertising. The bottom line: It's hard to break even.

"We don't make money by pumping the tank," he concludes. "Maintenance and repairs is where we make money."

WE NEED ANSWERS

For pumpers to have a chance to maintain a thriving small business, they need to know their fixed costs, have a reliable outlet for disposal and then set their own prices to ensure a profit. Under the present circumstances, Bowen and other pumpers across the country are having a tough time plugging any of those facts and figures into a business plan.

For the good of the millions of homeowners who utilize septic systems and the technicians who keep them in tip-top shape, I hope clearer disposal answers are on the way. ■

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LOSS OF LAND APPLICATION

exploring treatment options

Florida pumpers are losing their land spreading options. Land application of septage has routinely been under fire and bans in other areas may not be far behind. Read about how a Florida pumper planned ahead to give himself options, and what you can do if facing a similar situation. **pumper.com/featured**



O&M UPDATES

system care after repair

Continuing with the theme of remediation, one of the most important steps is at the end: educating the homeowner about the care of their rejuvenated system. Providing a plan for the homeowner to monitor the system needs to be a priority after a repair or remediation. If they aren't informed, eventually all your hard work getting their system back in shape will be for nothing. Here are some tips on providing a system management plan. **pumper.com/featured**



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a Hotsy hot-water unit that makes short work of grease clogs, says Chris Roseland.

But the most noteworthy aspect is the Cummins Westport ISLG natural gas engines (320 hp), which will reduce the company's operating expenses. The natural gas conversions, performed by Truck Center Companies, are relatively simple: The gas tank and fuel delivery system is replaced with a CNG tank and a new fuel delivery system. Then, another conversion kit enables the original gas engine to run on natural gas, Roseland says.

Right: This American Pumping vacuum truck shows it's going green by promoting the natural gas power plant.



The Roselands bought American Pumping in 2012 and made it a subsidiary of a larger company they own, Backlund Plumbing, which Mark and his wife, Sally, bought in 1987. The Roselands wanted to further diversify Backlund Plumbing's business base, which includes residential, commercial and municipal drain cleaning; residential and commercial plumbing; hydroexcavating; and water and sewer line installations.

CNG vehicles allow us to offer pumping services at a lower cost. The more miles the trucks travel, the more money we save.

— Chris Roseland

"We basically grew as our customers' needs grew," says Chris Roseland, a master plumber who joined the company in 1994. A good example is outside utility installations, such as new waterlines — work the company didn't do until 2008, based on growing demand from customers. That required a significant investment in tractors and backhoes needed to install fire lines and storm and sanitary lines.

"There was a huge learning curve in how to do outside utilities," he notes. "But we took our experienced plumbers and added utilities to their scope of work. They took OSHA confined-space entry classes and learned safe excavation techniques — things like what equipment to use in what situation, how to use it, and proper compaction and backfilling techniques."





Left: One drawback to running vehicles with compressed natural gas is a scarcity of filling stations. That is expected to change, however, as more CNG trucks hit the road.

QUALITY CONTROL

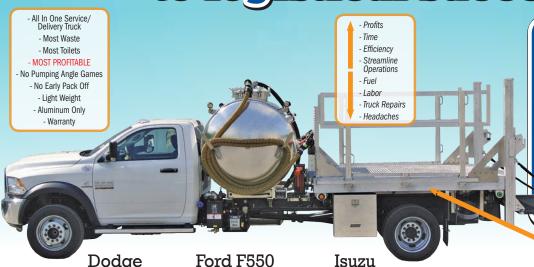
Backlund Plumbing also diversified to reduce its reliance on subcontractors. By offering as many services inhouse as possible, the Roselands felt they could better control the quality of work as well as job schedules, unhindered by subs who might show up later than expected.

"If someone calls with a problem at midnight, we show up with all our vehicles and we don't have to wait for a sub to show up," Roseland adds. "We run a 24-hour operation — no answering service. If the phone rings at 2 a.m., we answer it. Same-day service is a huge must in our world. And we also have the equipment ready to handle virtually any problem; we're a one-stop shop for plumbing, pumping, utility work and hydroexcavating. If people asked us to paint their house, we'd probably paint their house. ... We'll literally do anything."

Moreover, offering a variety of services avoids the all-eggs-in-one-basket problem that leaves some companies vulnerable to market downturns, he says. The strategy has worked well so far; since 1987, Backlund Plumbing has grown from a small service shop with just three employees to a multimillion-dollar-a-year company with 65 employees and a large fleet of vehicles and equipment.

(continued)

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Cross-training builds productivity

One of the keys to Backlund Plumbing's growth over the years is an employee cross-training program that improves efficiency at the Omaha, Nebraska-based company.

At Backlund, some plumbers know how to operate a vacuum truck, for instance. In other instances, sewer line cleaners can also run inspection camera systems. And along the way, employees make themselves more valuable to the company – and sometimes even earn pay increases. "One of my best drain technicians became a full-time cross-bore CCTV technician," says Chris Roseland, who co-owns the business his father,

Our employees are happier because on most days, they never know what they'll be doing. ... Doing different things keeps them invigorated about their jobs and helps to prevent burnout.

— Chris Roseland

Mark, bought in 1987. "He got a substantial pay raise for acquiring a new skill.

"Cross-training is a big reason why we excel," he adds. "We have very smart employees. One of our technicians likes to fix things, for example, so he learned how to repair pipeline inspection cameras. We also have interior commercial plumbers who want to be out in the dirt digging. So they learn how to

run excavating equipment. Then in winter, when there's less

digging going on, they can go back to doing interior plumbing."

Cross-training is time-consuming and requires thorough planning as well as a strong commitment. But in the end, it's worth the time invested, Roseland says, and not just because of the increased efficiencies. He points out that employees appreciate their employers more when they feel the company is interested in satisfying their career goals. As such, cross-training can reduce turnover as well as keep employees refreshed.

"I think our employees are happier because on most days, they never know what they'll be doing. ... We're as far from an assembly-line job as you can get," Roseland says. "Doing different things keeps them invigorated about their jobs and helps to prevent burnout."

Backlund also improves retention by paying top wages and offering good benefits, such as providing paid time off and a matching 401(k) retirement program, plus paying the bulk of employee health insurance premiums. "When people came to work for us 10 years ago, they came because we could give them 60 to 70 hour weeks and enable them to make more mon-

ey," Roseland points out. "Now they seem to prefer that we offer a 40- or 50-hour workweek, pay them a good wage and back it all up with a good benefits package."

To build company loyalty and teamwork, Backlund also holds special events for employees, like Thursday night bowling-and-pizza parties or fishing/hunting trips. "Once, we took 50 guys to a Kansas City Chiefs game," Roseland says. "We treat employees like gold because they're our most valuable asset.

"In 2015, we went from \$8 million to \$10 million in sales — with the same number of employees," he adds. "We did it thanks to diversified services and cross-trained employees."

"Utility repairs and plumbing repairs definitely feed off of our grease trap and septic maintenance business because of inspections," Roseland explains. "For instance, we may inspect a septic tank and find the leach-field isn't draining properly because the lines are clogged. It works the same way with grease traps. ... A lot of grease traps we clean out also require line jetting.

"The fact that we utilize Spartan trailer-mounted water jetters to jet and wash down grease traps helps separate us from other companies," he continues. "With all of our sewer cleaning equipment, we can do a better job than a guy with just a septic truck with a pump at his disposal."

Those synergies also work in reverse, he says, noting that plumbing repairs sometimes lead to grease trap or septic tank work for American Pumping. In addition, competing plumbing firms sometimes hire American Pumping when they unexpectedly encounter jobs that require grease trap or septic tank cleaning.

"That's why we kept the name American Pumping," Roseland explains. "If a plumbing company that maintains restaurants wants to subcontract grease trap work, for example, we figured they wouldn't want a truck pulling up on the job site with the name of a competing plumber on the truck."

ALL IN WITH NATURAL GAS

The Roselands were already familiar with the dynamics of natural-gaspowered trucks. In 2012, the company converted 10 Ford Econoline service vans, used for drain cleaning and plumbing work, to natural gas. Today, natural gas also powers seven Ford Transit vans, two Dodge 2500 flatbed delivery trucks, three Freightliner FL70 service trucks, and two dump



trucks featuring Freightliner FL70 chassis and (in-house built) 7-cubic-yard dump bodies.

High fuel prices played a key role in the decision to convert to natural gas. In 2012, the average price for a gallon of gasJamey Severn (foreground) and Johnny Compos remove sediment from a tank using a CNG Freightliner M2 vacuum truck and a 2012 Vacall AllExcavate hydroexcavator.

oline nationwide hovered around \$3.60. "At the time, we were doing work for the city's Metropolitan Utility District (MUD) and I noticed they were converting their vehicles," Roseland recalls. "So I inquired about it."

Back then, CNG cost just \$1.70 a gallon. In addition, natural gas prices

(continued)



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historically aren't subject to the volatile swings commonly seen in gasoline prices. And while the conversion price was expensive — about \$12,000 per service van — MUD was offering a 50 percent rebate. That sealed the deal, he says.

"With financial assistance from the rebates, our break-even point was running 3,000 gallons (of CNG) through the vehicles," Roseland explains. "Each van saved about \$4,000 the first year through reduced fuel costs. I'd say 90 percent of those first 10 conversions paid for themselves within the first two or three years."

There was a strong case for converting the septic pump trucks to natural gas because the city of Omaha requires contractors to dispose of all grease trap and septic waste at the city's main treatment plant. In some instances, that means route drivers must make a 40- or 50-mile round-trip from Omaha to rural customers and back to the treatment plant. "So CNG vehicles allow us to offer pumping services at a lower cost," Roseland points out. "The more miles the trucks travel, the more money we save."

STILL REAPING SAVINGS

Gas has fluctuated downward and back up a bit, so the fuel savings aren't as dramatic. But Roseland points out that since the vans' conversions, the company also converted the two Freightliner dump trucks and other vehicles that used diesel fuel, which remains more expensive than CNG.

The cost of larger CNG-powered vehicles, such as the Freightliner dump trucks (which come with John Deere or Cummins CNG engines), is about \$60,000 more than for a conventional truck. As such, the payback period is longer — about two years, he notes. "When diesel is at \$4 a gallon and CNG is \$2 a gallon, we might save up to \$250 a day," he explains.

In my opinion, fuel prices eventually are going to go back up. Our vehicles have a seven- or eight-year life cycle, so we're betting that fuel costs will average out higher in the next seven years.

Above: Chris Roseland talks about the day's workload with

service manager Tom Ostrand.

manager of Backlund Plumbing/

Right: Leslie Brown, service

American Pumping, talks to a

- Chris Roseland

"In my opinion, fuel prices eventually are going to go back up," Roseland continues. "Our vehicles have a seven- or eight-year life cycle, so we're

betting that fuel costs will average out higher in the next seven years." In the short term, he remains undaunted by lower fuel prices; the company plans to buy and convert five more Transit vans in 2016, he says. "We've never lost money (using natural gas over gasoline)."

Backlund's revenues have increased since the natural gas conversions, and Roseland attributes much of it to the company's ability to brand itself as a "green," ecoconscious business. "I can verify that because we've only promoted it on our vinyl vehicle wraps, and when people call, they usually ask about the CNG trucks," he says. "They notice that we've done it. Our employees tell me that customers are always asking how it works. I think that if we're on par with a competitor price-wise, we get chosen because we're 'greener.""

Roseland says the use of natural gas doesn't affect engine performance. "Three-hundred hp on (an engine using) diesel fuel is the same as 300 hp with natural gas," he says. The only difference he's noticed is that the natural-gas-powered engines seem to run a little hotter and burn a little more oil than conventional diesel- or gasoline-powered engines.

There is one drawback to CNG-powered vehicles: Fueling stations are scarce. Roseland says the compa-

ny is fortunate because there are two CNG stations within a mile of the company's headquarters. In addition, all the CNG vehicles have only a 250-mile range, so drivers must always be aware of their proximity to fueling stations. "But they're adding more refueling stations every year," he notes.

FILLING THE GARAGE

As demand for drain cleaning services grew, so did the company's roster of equipment. Today, the company owns two trailer-mounted Spartan 798 jetters (4,000 psi at 18 gpm), equipped with 500-gallon water tanks, and a 2010 Camel 1200 vacuum truck with hydroexcavating capability, made by Super Products LLC. It features a 12-cubic-yard debris tank, a 1,500-gallon water tank, a blower made by Howden Roots (4,460 cfm) and a water pump (80 gpm at 2,000 psi) made by Myers (a brand owned by Pentair Ltd.).

In addition, the company also relies on five cart-mounted cable drain cleaning machines made by Duracable Manufacturing Co.; six VuTek push cameras for pipeline inspections, made by Insight Vision; several Mini-SeeSnake pipeline inspection cameras made by RIDGID; and a Dodge Sprinter camera truck equipped by CUES with a LAMP inspection camera that includes lateral-launch capability.

The company also owns a 2012 Vacall (Gradall Industries) AllExcavate hydroexcavating truck, built on a Sterling chassis with a 12-cubic-yard debris tank, a 1,300-gallon water tank and a 5,150 cfm Hibon blower (Ingersoll Rand), and two trailer-mounted vacuum hydroexcavators made by Ditch Witch (Charles Machine Works). Used primarily for utility potholing, the units feature a 500-gallon debris tank and a 250-gallon water tank.

In addition, the company owns five mini-excavators and two skid-load-

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ers made by Bobcat Co., three John Deere loader backhoes and one Caterpillar excavator.

Owning a wide range of equipment helps Backlund land jobs that it otherwise couldn't bid on. A good example is a massive, ongoing sewer rehabilitation project in Omaha, slated for completion in 2027. Known as Clean Solutions for Omaha (CSO), the project includes separating combined stormwater and sanitary sewer lines, which in turn will reduce the number of sewer system overflows that result in raw sewage discharges into the Missouri River and other local waterways.

"It's been a real boon to our vac truck business," Roseland says of the project, which also includes construction of a deep tunnel and underground detention basins to store excess stormwater during heavy rainfalls. "The detention basins have to be cleaned of debris periodically." The vac trucks are also used to pump out holding tanks that store sewage diverted there while the mainlines are under construction, he adds.

TIME TO GROW

As for the future, Roseland says the company is aiming for 10 percent growth in sales during 2016, with much of the increase coming in sewer and water infrastructure work.

He also says that acquiring another company isn't out of the question. "We're always thinking like that," he says. "We're always willing to consider getting into something new." ■

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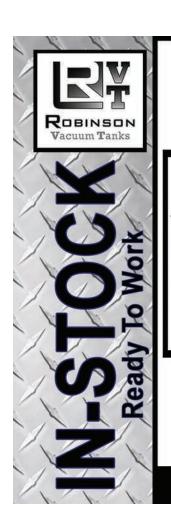
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is a business writer in Racine, Wisconsin.

Smartphones: Big Benefits, Big Costs

Yes, they are go-to devices for your business. But it pays to review your plans and usage frequently so prices don't get out of control. By Erik Gunn

It's almost like you've got a

hands. Even with the

cheaper than the old

saves time. 77

mini office there in your

cost of use it's still a lot

Hollis T. Warren Sr.

he Apple iPhone will mark its 10th birthday next January — but can anyone imagine the world without it or its principal rival, the Android-based phone launched roughly 20 months later?

Neither of them were the first smartphones — mobile phones combining the convenience of cellphones with the power of computers. But they turned the smartphone from a specialized tool for a small slice of businesspeople into one found in nearly every pocket or purse.

They're still a business tool, and they're relied on more and more by all of us, including septic pumpers and drain cleaners. And neither they nor the data they bring to the palms of our hands — are cheap. But are they worth it, anyway?

You can get smartphone apps to track business mileage, manage cloud-based task lists, and much more. Smartphones can also tie into your databases back at the shop. With features such as Google Maps, they're supplanting stand-alone GPS devices for many of us. And they allow rapid communication between you and your crews and among crew members themselves — whether by email, text messaging or good old-fashioned voice phone calls (how 20th century!).

'NAKED' WITHOUT THEM

Hollis T. Warren Sr. owns Hollis Warren Inc., a septic service located in central Delaware near Dover, the state capital. His drivers have been using Apple iPhones on the job for 10 years — about as long as they've been around. "I never thought it would be that big a deal," says Warren. "But you

feel naked if you don't have one on you anymore."

They're a necessary communication tool, he says. Drivers can phone ahead to let customers know they're on the way. If they lose their way en route to a job, they can call for directions or bring up Google Maps.

The map apps also allow the driver to scope out a customer's yard configuration before arriving at the job site. Utilizing an app called Planimeter in conjunction with the map, drivers can calculate how long a hose they'll need to run from the tank to the truck. When the work is finished, the driver can take the customer's credit card payment on the spot using the phone.

A driver who runs short of a needed part can just call back the office for the item to be driven out to the job instead of having to stop, drive back to fetch it, and then return. By avoiding lost time, "it's going to save you a lot of money," says Warren.

Warren's employees can choose to use their own iPhone or one issued

by the business. In either case, they must follow rules: No personal calls or web surfing during work hours. "They've got breaks and lunch when, if they've got something personal, they can go and use them for that," Warren points out. And no calls while driving — that's against Delaware state law unless the driver can talk hands-free.

Before the iPhone, the business used two-way radios. Warren says there's no comparison between that technology and the iPhones. The radios could only communicate back to the office — and they cost nearly 10 times what an iPhone cost. "You can spend as much as \$5,000 for one radio in the truck."

> He's never put pencil to paper to measure what the phones are worth, but he estimates they probably net him a 10-15 percent savings on various costs. And that's even when you consider that his current business data limits are probably too low. "We're always going over - so it's expensive using them sometimes," Warren admits. But the convenience they offer is worth it. "It's almost like you've got a mini office there in your hands," he continues. "Even with the cost of use it's still a lot cheaper than the old way of doing things. Time is money, and it saves time."

way of doing things. Time is money, and it THE SMARTPHONE EQUATION

If you don't have smartphones in your business, chances are you're wondering about them. But even if you do, you might benefit from a closer look at how you're using them. Either way, you may want to consider a few important

factors about bringing (or keeping) smartphones on the job where you work.

Whose smartphones will your employees use - their own, or a company-issued one?

If they use their own, you'll need to work out clear and fair policies for reimbursing them for the cost of their phone use for business purposes. You may find an advantage to simply getting everyone a company phone for company business. In either event, be sure to establish clear policies and procedures, as Warren points out. Making sure they can't fritter away your work time on Words with Friends or Angry Birds games is just the start.

What are the best cellular networks in your region?

Service varies around the country, and as the big carriers continue to invest in improving their coverage, the best carrier this week could fall behind six months down the road. Ask people you know; you could start with

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your employees, who probably have their own phones already and can tell you about their experiences. Consumer Reports from time to time ranks the various carriers; it wouldn't hurt to see what the magazine's most recent report says about the carriers in your area.

What specific plan will be best for your business?

Data plan structures are changing all the time. Early on, carriers offered unlimited data plans (for a definite markup, to be sure); later they backed away from them. Now they're coming back, pricier than ever — but it's an open question whether they're worth the expense. Even "unlimited" plans have their limits: If your usage goes over a certain level, carriers may effectively slow down your data speed.

Under most plans, though, data is priced in increments of 5 or 10GB a month — and if you go over, there's a premium charge. You can see the dilemm: Do you go with a rich plan that might be more than you need, essentially "wasting" the additional dollars it costs compared to a cheaper plan that's closer to your actual usage? Or do you go with a lean one, risking that you'll go over it and have to pony up more?

Only you can decide which answer suits your situation better. Once you do choose, watch your bills: If you're always paying overage charges, you'll probably be better off stepping up to a monthly data plan with a higher ceiling. And if you always use a lot less than you're paying for, you can switch downward after a few months.

Note — I'm saying plans, not carriers; carriers typically lock you into a contract of two years or some other fixed term, which remains in place even if you shift your data plan up or down.

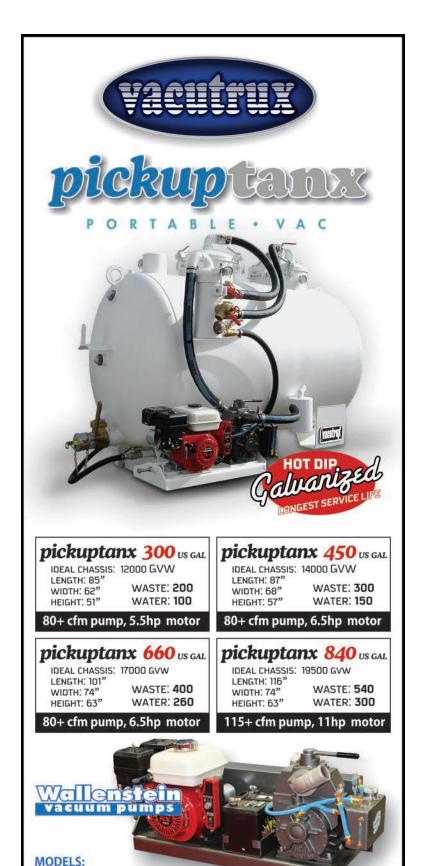
Would you do better on a "pay as you go" plan?

An alternative to going with the big carriers and their two-year contracts is a no-contract plan, paid for by actual usage and able to be terminated at any time. Providers include Tracphone, Ting, Consumer Cellular and others. They may promise substantial savings, but you'll have to consider your own usage patterns.

Running some hypothetical comparisons with Ting's calculators, if your actual data usage is way under the big carrier's monthly data plan limit, you might realize substantial savings by switching. If your usage usually approaches your actual limit, however, the savings don't appear to show up.

CHOOSE WISELY

Like a lot of business decisions, adding smartphones or switching plans may require you to make some careful comparisons. Take the time and choose the option that best suits your needs. After all, isn't getting the best deal you can one of the smartest things you can do? ■



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River View has seen a 10 percent growth in sales and labor every year for the past six years and Weinkauf says it's because the company has solid employees and takes chances on new equipment like the hydroexcavators.

"We're not afraid to get into something if we think it's doable," Weinkauf says. "And I'll put our crews against any crew in the United States."

TRYING SOMETHING NEW

A River View crew

uses a Vactor HXX

hydroexcavator to

construction site.

expose utilities at a

Ewald Weinkauf, Randy's father, founded the company to haul milk in central Wisconsin. "He did that milk route for a while and then he started moving over into operating 5-yard dump trucks," Weinkauf says. "Then he bought a backhoe and a dozer and started doing land-clearing work."

Ewald, who died in 2000, began moving around pulp and other material at the local paper mill in the 1960s. By the early 1970s, the company picked up some business with an electric utility at its local coal-fired power plant.

has solid says. "They needed a contractor to haul ash from their storage silo to an onsite landfill and we filled that role."

Weinkauf River View's main focus now is environmental contracting. "We operate a landfill in Monroe County, Wisconsin. We also maintain methane gas piping systems at landfills and we build leachate collection systems," says Jesse

River View's main focus now is environmental contracting. "We operate a landfill in Monroe County, Wisconsin. We also maintain methane gas piping systems at landfills and we build leachate collection systems," says Jesse Turner, vice president of sales. The company built its first landfill in Vilas County, Wisconsin, in 1989 and has completed many other landfill projects throughout the state.

"We worked with ash handling when they started using coal," Weinkauf

PIVOT TO HYDROEXCAVATION

Building a landfill takes a lot of equipment, from bulldozers to long-

reach excavators, dump trucks and hydroexcavators. "It all starts with excavation work," says Turner. "You strip the topsoil and you start from there."

The company builds its cell — the base of the landfill — and then gets a sub-base compacted and approved by the Wisconsin Department of Natural Resources (DNR). The company then hauls in clay. "The clay goes in 4 feet thick and we place it in 6-inch lifts," Turner says. "Every lift has to be tested with a nuclear density gauge and approved by the DNR."

If we know there are utilities on a job site, the hydroexcavator is the first piece of equipment that goes out.

- Randy Weinkauf

density gauge and approved by the DNR." Once the clay is installed and approved, a 60-mil membrane liner is placed over the entire landfill area and a foot of drainage rock — the leachate drainage layer — is installed. "Landfills can take a while to complete with the land clearing involved," Weinkauf says. "It can take anywhere from three to six months or longer depending on the size." While landfills remain the core, company officials knew they needed (continued) The River View Construction crew ncludes, from left, Dewey Lannigan, Jesse Turner, Randy Weinkauf, Andy Hafenbreadl and Gerard Skrzypchak. Behind them are the company's three hydroexcavators, from left, a Premier CV-100 and two /actor HXXs.



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Right: A River View crew uses a Vactor HXX hydroexcavator to expose underground utilities.

Below: Operator Kevin Schmoll shovels the remainder of the debris from a Premier hydroexcavator.



In the mid-2000s, Weinkauf's project manager approached him with the idea of purchasing a new type of equipment — a hydroexcavator. The hydroexcavation market was in its early stages in the U.S. at that time, and very few contractors had the machines in Wisconsin.

"Gerard Skrzypchak had a talk with me back in 2006 and told me that these hydrovac trucks would be the wave of the future," Weinkauf says. "He's the one who talked me into getting them."

Skrzypchak knew about hydroexcavation from his time working for a utility company where he created the excavating permitting process, in which it became mandatory for the utility to use hydroexcavators. The utility uses a hydroexcavator to first identify where utilities are and whether there is enough space between them to continue excavation with backhoes. If there isn't enough space, the job is finished with hydroexcavators.

SUCKING SAND AND MUD

"You have a menagerie of things underground," Skrzypchak says. "It's like a spaghetti bowl underground of high-voltage lines, natural gas lines, chlorine lines, hydrogen lines and fiber optics. It's all intertwined."

River View purchased its first hydroexcavator, a Vactor HXX built on an



Left: Schmoll works in tight quarters with a Premier hydroexcavator.

International chassis, in 2006 and immediately picked up more utility work. The company also landed a job for American Transmission Co. (ATC) on construction of a new electric transmission line. "The pads their trucks sat on needed to be vacuumed all the time," Weinkauf says. "If there was any sand or mud on them, we would have to keep them clean and the hydrovac trucks helped with that a lot."

The pads had to be cleaned so the utility's equipment could sit perfectly level

while work was being done. River View found the hydroexcavators useful on that job because hose attachments could be added for longer reach.

The company bought its second hydroexcavator, a Premier CV-100 built on a CAT660 chassis, in 2012, and another Vactor HXX built on a Kenworth chassis in summer 2015. "We needed another one because we had so much work in March and April," Weinkauf says. The company tested the newest truck through the spring months on sites where new lines were being installed at cellphone tower substations.

All three trucks have 12-cubic-yard debris tanks and vary in water pressure capability. The biggest is the Premier truck (6,200 psi), followed by the new Vactor (5,200 psi) and the original Vactor (3,500 psi).

"Each truck has advantages depending on the application," Weinkauf says. "One might work better with slurries than the others and one might

(continued)

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GPS units a cost- and time-saver

It's not the bulldozers, the backhoes or even the hydroexcavators that River View Construction couldn't do without. It's the Trimble GPS devices installed in the dozers.

"Our guys wouldn't be without them," owner Randy Weinkauf says. "It's one of the most important tools we have. We put them in the bulldozers so they know where they are going. We don't do staking on our job sites. It's all GPS."

The Trimble GPS systems can calculate exact positions on excavation projects such as boundaries, cross slopes and other land obstacles. River View started putting GPS on its bulldozers in 2002, according to Weinkauf. With each new bulldozer the company installs a new and updated GPS unit.

"At the time, everybody thought we were nuts sticking a \$60,000 GPS unit into a dozer, but we saw the need for them with the stuff we do," Weinkauf



dump better than the others." The Premier truck has a heated compartment that is popular with operators, while the new Vactor has the water hose on the back, so operators don't have to drag the hose through mud.

EXPANDING ITS REACH

River View is one of few contractors offering hydroexcavation services in the northern region of the state. "We go all over the northern part of the state and we'll do utility work, gas line work and water main break repairs too," Weinkauf says.

The company takes pride in being available whenever needed, as in 2014 when Weinkauf got a call late Christmas Eve about a water main break at a paper mill in Mosinee, near River View headquarters. "They were going to have to shut down the mill if we weren't able to get the fire protection line cleaned up," Weinkauf says. "It had split wide open."

Weinkauf, Dewey Lannigan (vice president of operations) and another hydroexcavator operator took on the challenge. "They originally wanted a backhoe there, but we brought the hydrovac," Weinkauf says. "They used the backhoe for the first two scoops and then we used the hydrovac after that because there was a substation right next to us and we didn't know how much was under us. We located the break and sucked all the sand and water out of there. The mill repaired the break and stayed in operation."

Being in Wisconsin has also meant taking on jobs when the weather isn't the best. Crews were called in winter 2013 when a plow truck driver ran into a gas meter at a mobile home park. The utility servicing the area needed it dug up to replace. "Our driver was only able to go about 10 mph in certain areas because of the snow and ice on the highway, so it took him two hours," Weinkauf says. "He made it down there and was able to open it right up and they capped the leak."

About 70 percent of the company's hydroexcavation work is done in the winter when it's harder to break up the ground with traditional excavation equipment.

JOB SATISFACTION

With 65 employees, it can be tough to keep everyone happy, but River View has a stable workforce in an industry that sometimes faces high turnover rates.

"I have an open-door policy," Weinkauf says. "If somebody has a problem or if they know of a way of improving something, I listen to them. Most of the time I'll take their suggestions." Weinkauf adds that his crews give him reports on whether new employees are fitting in well.

"Every year we make our crews better," Weinkauf says. "We have a very low turnover rate, usually losing one or two a year." A big part of keeping employees is paying them well: Operators earn a living wage. "For good labor you have to pay well," Weinkauf says. "We treat them like humans and not like numbers."

Crews receive required annual training. In January the company brings in representatives from the utility and several other customers to go over their company safety programs. River View selects a training day and calls off all field operations for that day. "We shut down every job we are doing and we bring everyone in for it," says Turner. "Everyone gets certified for hazmat and receives other refreshers."

Every year we make our crews better. We have a very low turnover rate, usually losing one or two a year. For good labor you have to pay well. We treat them like humans and not like numbers.

- Randy Weinkauf

The company also holds job site meetings every morning for the crews. "They have the tool safety talk in the mornings to see if there are any concerns or what the truck traffic might be that day or if there will be visitors or inspectors coming. They'll go through everything," Turner says.

Safety is important to the company, as it can lead to or take away jobs and clients.

"With a bunch of our clients, if you have a serious accident, your name can be wiped off their vendor list," Weinkauf says. "If you are an unsafe company, you won't be working

for them. We want to be one of the top contractors. You have to be safe, and there is no getting around it."

CARRYING THE TORCH

While Weinkauf plans to run the business until it's not fun anymore, he admits some days can be tough. "It gets challenging, believe me. But as long as you have good people behind you, you'll be OK."

Weinkauf, like his father, would like to hand off the company to the next generation eventually. His daughter, Heidi Dehnel, handles payroll. Turner, a stepson, leads the sales team, while another son, Riley Weinkauf, unloads

ash at the coal-powered power plant with a front-end loader. Another son, Wesley Weinkauf, runs the company's long-reach backhoe at landfills the company is building. Chris Spychalla, a nephew, heads operations for jobs near Green Bay.

"It's going really well, so we'll be passing it on to a third generation when that time comes," Weinkauf says. "We want the kids to carry it on and teach them about maintenance and safety and new technology." ■











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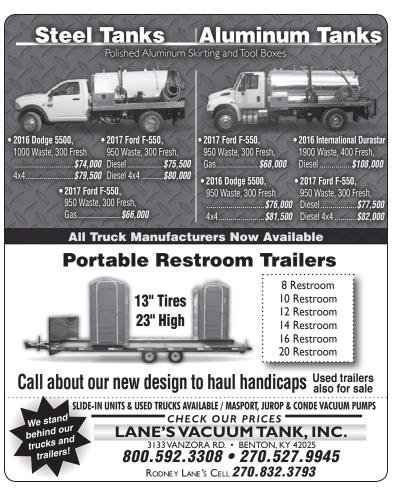
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Jim Anderson, Ph.D., is an emeritus professor at the University of Minnesota Department of Soil, Water and Climate and recipient of the pumping industry's Ralph Macchio Lifetime Achievement Award. Email Jim questions about septic system maintenance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

Installing Advanced Systems is Not Enough, You Have to Monitor Them

New technologies can provide better wastewater treatment in challenging situations, but only if they are inspected and maintained routinely By Jim Anderson, Ph.D.

ast month, I elaborated on the potential for new and developing technology to impact how we install, maintain and manage onsite systems.

In the end, I asked whether we are ready as an industry to embrace the technology and move into a whole new realm of system management.

I am always conflicted when this subject comes up. Over the years I have been a strong proponent of "simpler is better" and the thought that it's difficult for technologies to improve on the classic septic tank to a drainfield when it is properly designed, installed and maintained. I have also noted that when a problem arises, the simple approach is often abandoned too quickly in favor of a new technology, as opposed to figuring out the cause of the problem.

Another point of my reluctance to accept more technology as a solution involves performance in real-life conditions. Many new technologies are purported to do a much better job of treating sewage than a septic tank — ahead of the final soil dispersal area or final point where effluent enters the environment (nitrogen reduction systems as an example).

What is often glossed over or ignored altogether is that the performance of these systems is often not determined under actual operating conditions found at a residence. They may have all the necessary certifications and testing to get them approved for use, but when put into place under real conditions, the performance may not be nearly as claimed. Of course, this may not be all that bad because the quality of treatment is still better than septic tank effluent.

MAINTENANCE CONTRACT NEEDED

For me the problem becomes, though, that attaining the higher performance levels requires significantly more care in an advanced system over a traditional septic tank. While this additional need is recognized and usually results in the requirement of some type of initial maintenance contract, over time that maintenance tends to go away. When the technologies are not maintained, their effluent can become "dirtier" than septic tank effluent, which has negative impacts on everything in the system downstream.

Participating in a couple of groups discussing and providing input to the U.S. Environmental Protection Agency and others looking at cleaning up Chesapeake Bay, I found that regulators and others share the concern that without some type of monitoring or sampling effort to ensure performance, it is questionable that technology changes alone will help over the long run. Sampling and monitoring are very expensive and time-consuming activities, so the question is how to make sure it happens.

Systems are, by and large, the responsibility of the homeowner, and the regulatory agencies are not necessarily going to know or be told that the technology is not being cared for. Hopefully, education of everyone involved will help, but probably more is needed. The rules and regulations governing our industry have often not kept up with the technology changes.

Just before I retired (almost eight years ago) I was associated with a group that was about to use a geographic information system to look at soil information around the Great Lakes to determine soil relationships to septic systems. This is an effort similar to some activities in the Chesapeake Bay watershed.

I don't know the exact figures in the analysis, but for me the results are sobering because they show that perhaps only 25-30 percent of the soils mapped in the areas feeding into the Great Lakes would have properties that clearly point to their suitability for my favorite simple septic tank drainfield system. Those numbers would certainly go up if we included mounds and at-grades as "simple" systems, but those are often viewed as alternative technologies that certainly also take more care.

MONITORING SENSORS

As I look at the larger wastewater industry, more and more I see stormwater management entities and water supply utilities use monitoring sensors to assess and predict performance. Some of this equipment is very expensive and can only be afforded by large municipalities and utilities. However, there appears to be a whole set of small, less expensive sensors about to come online that can be used at the scale of the systems we deal with. It may be five or 10 years before they are tested, proven reliable and generally available. Some of them, like flow-measuring sensors, are here already. Others, like nitrogen sensors, are being tested and will be coming.

This will open up whole new avenues of monitoring our systems for performance and it will be on a real-time basis. Think about how this could change your service visits. You can have real-time readouts on flow and nutrient performance, for example. A change or spike in the data would show you need a service visit to figure out why, and allow you to fix the problem before it impacts the rest of the system. Is this where you are moving? If not, maybe a part of your long-term planning should include looking into this and being ready to move when the technology becomes available. You could be ahead of the curve and offering services others will be unprepared to provide for a long time. It would be good for business and the environment. Imagine that!











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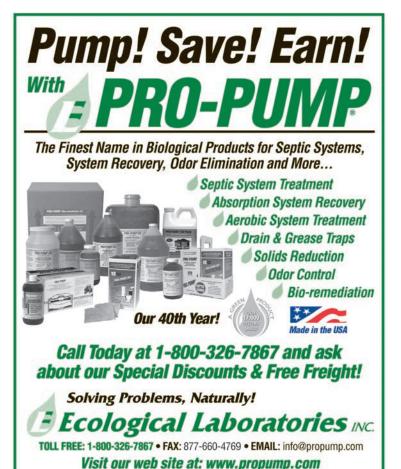
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RULES & REGS

Rules and Regs is a monthly feature in Pumper. We welcome information about state or local regulations of potential broad interest to onsite contractors. Send ideas to editor@pumper.com.

Alaska Explores New **Technologies to Meet Rural Water** and Wastewater Challenges

By Doug Day

he Alaska Department of Environmental Conservation (DEC) Village Safe Water Program will hold an invitation-only conference in September to discuss the issue of providing running water and sewer services to remote Arctic and sub-Arctic communities and how to make those services more reliable, affordable and sustainable. The Conference on Water Innovations for Healthy Arctic Homes (WIHAH) will be held in Anchorage Sept. 18-21. Experts from around the world will speak or demonstrate innovative technologies. Three teams in the Alaska Water and Sewer Challenge will showcase their prototype systems in the research and development program seeking alternative and more affordable methods for delivering drinking water and sewage disposal services to rural Alaska. More than 3,300 rural homes lack running water and a flush toilet.

Minnesota

The Minnesota Pollution Control Agency is working on a rule change that could require septic tanks to be pumped dry prior to an inspection to determine their integrity. MPCA hopes to have the rule finalized in time for 2017 fieldwork. In working with stakeholder groups, the agency says there is widespread support for the rule since most onsite professionals are already pumping tanks dry for inspections. Some have said, however, it is not always necessary, such as if there is a tank integrity report that shows the tank passed inspection within the last three years.

Drinking Water and Wastewater Professionals Appreciation Day was held throughout the state June 30. Both houses of the Virginia General Assembly unanimously passed their versions of the bill (HJ 88) earlier this year to recognize the importance of clean water and the contributions of those who work in the field.

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Finding Environmental Solutions for Pumpers in Western Canada

One umbrella association is making regulatory headway in serving the training and professionalism needs of diverse groups of wastewater professionals By Doug Day

rom her main office in Edmonton, Alberta, Lesley Desjardins keeps busy working with the onsite wastewater professionals and regulators covering nearly half of Canada. From the Pacific Ocean, across mountains and a desert to Hudson Bay, it is her job to coordinate how those in the industry protect public health and the environment. Members include all areas of the industry, from designers and installers to pumpers, regulators and suppliers.

Desjardins is the executive director of the Western Canada Onsite Wastewater Management Association (WCOWMA). The group covers the provinces of Alberta, British Columbia, Saskatchewan and Manitoba.

How much of your effort involves trying to standardize across the provinces?

Desjardins: That's really important in Canada and one of the reasons we formed WCOWMA, to standardize training across western Canada and allow the western provinces to share training and infrastructure resources.

We have federal and provincial agreements on recognition of equivalent training, such as the Agreement on Internal Trade (an intergovernmental agreement covering all agencies of provincial and federal governments). Somebody certified in onsite wastewater from one province that requires it can go to any other province that requires it and have their certification recognized. So it's really critical that



Reach Lesley Desjardins at 877/489-7471 or email lesley@ wcowma.com.

training is standardized, because contractors can come from different regulatory frameworks with differing training requirements. Standardizing training requirements will help mitigate potential issues.

How did this all come together?

Desjardins: We started with the Alberta Onsite Wastewater Management Association (AOWMA), the largest organization in western Canada, which incorporated in 1998. By the mid-2000s, the Alberta association had so many members from British Columbia and Saskatchewan that we decided to create an umbrella organization. Servicing them all from Alberta just wasn't getting our members in other provinces the best representation, so we incorporated WCOWMA federally in 2008 and set up a chapter in each province with its own autonomous board of directors. Each is financially independent from the others.

WCOWMA allows the provinces to share information and resources such as curriculum and infrastructure like a shared website and phone system,

while giving us the ability to combine the voices from all the provinces for advocacy purposes. There is staff in each province and I manage all four chapters. We have four contracted staff, one who deals with Saskatchewan and Manitoba, one for British Columbia, and two in Alberta. We're pretty busy.

Each of the boards meet every six to eight weeks and I attend either in person or virtually, which makes my life a little easier. As each provincial association becomes larger, they will require their own operations manager. We're not there yet.

What are the membership numbers?

Desjardins: We have two membership classes. There are voting corporate members (companies), and nonvoting under-corporate members (employees of member companies). Alberta, Saskatchewan and British Columbia are all growing, and right now B.C. is enjoying about a 20 percent

Whenever there's a recession, there's a recession, there's a lot more competition. That's when you typically see things like underbidding jobs, which are not positive. It can lead to inadequate systems being installed.

- Lesley Desjardins

growth rate in membership per year. Alberta has 568 corporate, 320 undercorporate members; British Columbia has 204 and 105; Saskatchewan has 60 and 25.

Manitoba is a little different. We don't actively recruit memberships and collect member dues because they have an onsite group, the Onsite Wastewater Systems Installers of Manitoba, and we don't want to hinder their ability to attract members. We focus on advocacy with the government and the promotion of homeowner education there. We have provided support to them over the years such as training and workshops.

How do you interact with regulators across the provinces?

Desjardins: I regularly meet with them either in person or in virtual meetings and I sit on a variety of committees in the provinces. Probably every six weeks or so I'm traveling from one group to another. During the convention season in January through April, there's a significant amount of intraprovincial work that may require travel throughout Canada and sometimes the United States.

British Columbia has been particularly busy in the last year because we have submitted training curriculum to their certification body for accredita-



tion. Over the last year-and-a-half, some of the training has been adapted from other provincial training programs, some has been developed in B.C., and some was adapted through our partnership with NAWT (National Association of Wastewater Technicians). We partnered with them on some of their O & M and inspection training. B.C. also adopted a new Standard Practice Manual in 2015, so there has been a learning curve related to that.

In Alberta, the Safety Codes Council adopted a new Standard of Practice that became effective in January. The transition to that will go on for the next year. All certified contractors in Alberta are required to participate in continuing education. The AOWMA is currently delivering that training throughout the province. More than 1,300 contractors will be trained during 2016 and early 2017.

Saskatchewan's Ministry of Health has always worked closely with Alberta and adopted its training program in 2009 so the guidelines are very similar. Training isn't mandatory there, but the industry is very keen to see that. The regional health officers who do the system inspections are pushing for it as well. There is some hesitancy at the ministry level. The population is only about 1 million people and the onsite industry is quite small. But about 150 contractors and health officers have voluntarily participated in certification training; that's a significant number.

Manitoba has had no one at the ministry level for onsite wastewater for about three years. Last year, Manitoba Conservation hired a new manager in that capacity. He has a background in onsite wastewater, worked as an inspector and did research in this industry, so he brings a lot of expertise to the position. Currently, we are in the process of sharing curriculum and resources as Manitoba Conservation plans for a training program update, making some changes to their continuing education requirement, and expanding access to field workshops. Certification is required in Manitoba, but they haven't had their own standard of practice, and that looks like some-

thing they want to change. It will be interesting to watch and hopefully participate in that process.

How does representing such a broad territory complicate things?

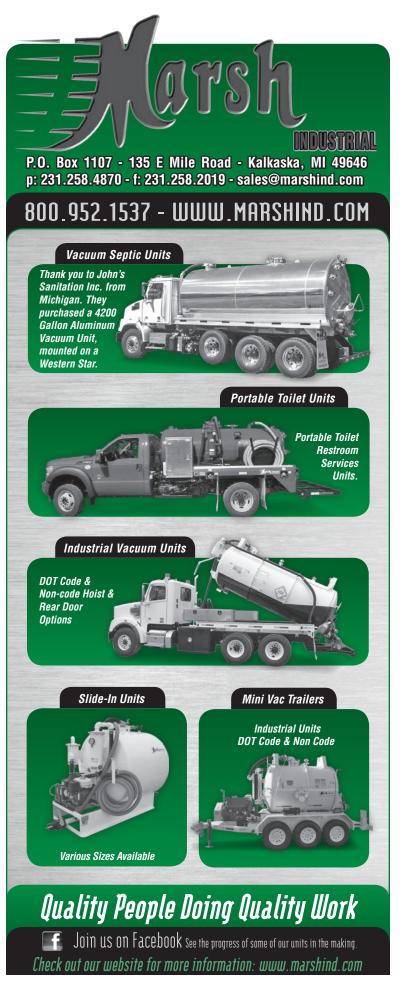
Desjardins: You do see different types of systems from province to province largely due to geographical differences. The coastal areas of British Columbia are very much like Washington state, there are mountains in the east and west, but the interior has the Okanagan Desert and high prairie in the north. Alberta and Saskatchewan have very similar high prairie and forest landscapes, except Alberta has the Rocky Mountains. Manitoba and Saskatchewan have issues with heavy clays and a lot of lakes. There are certainly regional challenges with the types of systems that can be used.

Overall, the challenges and issues experienced in the industry are very similar from province to province.

What challenges are coming up for the onsite industry in western Canada?

Desjardins: We weren't really impacted by the recession of 2008-09, but we are being impacted now. In Alberta, Saskatchewan and part of northern British Columbia, the oil industry is really depressed. So we're going to be seeing people who work in private sewage in the oil industry, which is a different animal altogether, moving to work in the residential sewage industry. That may create some issues because the design and installation of these types of systems is significantly different.

Whenever there's a recession, there's a lot more competition. That's when you typically see things like underbidding jobs, which are not positive. It can lead to inadequate systems being installed. We're anticipating that we may see some fallout from the fact that the western provinces are feeling the pinch of a recession right now.





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Cape Cod Facility Nears Two Decades of Onsite Experimentation

The Massachusetts Alternative Septic System Test Center monitors a variety of new technologies, but also looks at simple sand and sawdust drainfield bed By David Steinkraus

emoving nitrogen from wastewater is a complicated challenge anywhere, but in Massachusetts, George Heufelder is working toward a simple solution. It is not big, not chemical, and not expensive. And it involves sawdust.

Heufelder directs the Barnstable County Department of Health and Environment, which covers Cape Cod. The department also operates the Massachusetts Alternative Septic System Test Center to measure the per-

formance of new technologies. But for nitrogen removal Heufelder turned to an older idea, as he explains to *Pumper* readers.

Pumper: Do you have a problem with anoxic zones?

Heufelder: There are some embayments stressed by an excess of nutrients, and while we have had some marine life killed by a lack of oxygen, we have nothing like the problem in the Gulf of Mexico.

We've known about the nitrite problem here since the early 1990s. We have coarse, sandy soils so nitrogen travels freely as nitrite. Through a great deal of work we have the watersheds on Cape Cod very well mapped, and the conclusion is septic systems are the core of the problem. More than 90 percent of the people on the Cape are served by onsite systems, and in some embayments, septic systems have been identified as more than 80 percent of the problem.



Reach George Heufelder, director, Barnstable County Department of Health and Environment, at 508/375-6613 or gheufelder@ barnstablecounty.org.

Pumper: Have people considered sewers as a solution?

Heufelder: It is generally true that sewer is the cheaper solution for a high-density population near water. But if the lots are larger and the watershed is large, it's not so inexpensive.

Onsite will continue to have the major role here, either individual systems or package plants serving 50 or 100 homes. I don't believe we will ever see 50 percent of the area sewered. And that's a dream. We probably will never exceed 30 percent.

Pumper: How does this sawdust-based technology work?

Heufelder: What we have at the moment is a soil absorption system beneath which we place various configurations of sand mixed with sawdust. Bacteria that convert nitrate to nitrogen gas colonize the sawdust layer and

use cellulose in the wood as a carbon source.

Pumper: How did you get the idea for this?

Heufelder: I learned about this work through talking to people at conferences. This is not a new idea. Agriculture researchers have been studying this method in a vertical configuration for some time to address runoff from crop fields. The Florida Department of Health funded a similar project where horizontal layers of sawdust mix were used to achieve denitrification. I also talked to Will Robertson at the University of Waterloo, who did some work on this a few decades ago, using a similar concept. Basically, I tried to simplify their concepts to make them as simple and inexpensive as possible.

We know you get a lot of treatment out of soil, and if we can enhance some of the qualities in the soils, maybe simple systems can do more than we think they can. I was surprised more people weren't looking at the concept.

We have three systems in the ground at our testing facility, and we're thinking of installing some in the field. It's pretty low-risk when you think about it. You're just adding a carbon source to the soil, and if it doesn't clog, maybe you have a winner.

George Heufelder

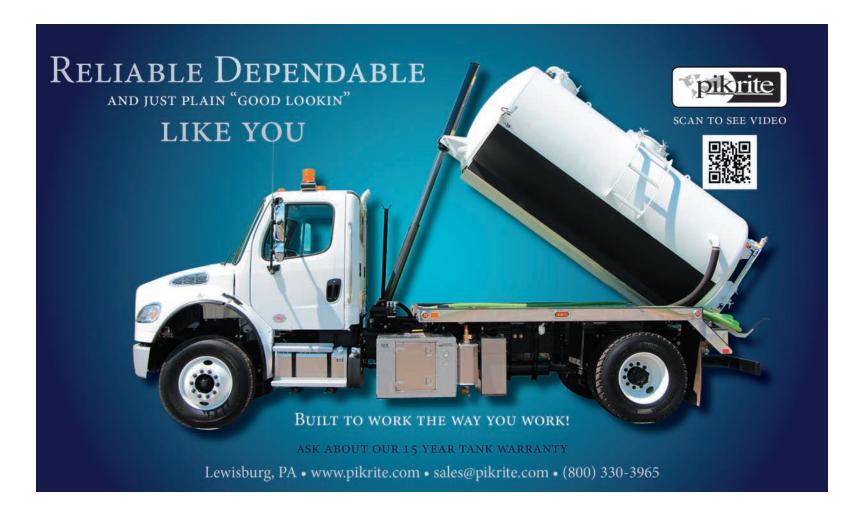
Pumper: How did your tests come out?

Heufelder: We put our first test systems in the ground in December 2014, and the results are promising. The first spring the levels dropped below 5 mg/L. We have three systems in the ground at our testing facility, and we're thinking of installing some in the field. It's pretty low-risk when you think about it. You're just adding a carbon source to the soil, and if it doesn't clog, maybe you have a winner.

What we need are more tests. The biggest unanswered question is how long the carbon source will last.

I'm not an academic, so I approached Jose Amador at the Uni-

versity of Rhode Island and their Laboratory of Soil Ecology and Microbiology, and George Loomis at the New England Onsite Wastewater Training Center, and we're collaborating on this work. Also, some people from the State University of New York at Stony Brook are looking at all the bacterial species that populate the sawdust bed so we understand that.



Pumper: How simple and inexpensive is the system so far?

Heufelder: One complexity we had to include was low-pressure dosing to spread the effluent evenly across the drainfield. Without that you're likely to burn a hole in your denitrification layer by overloading one area. Drip dispersal line works equally well.

Another reason for low-pressure distribution came from our work with personal care products and pharmaceuticals that come through in the wastewater stream. A lot of the endocrine-disrupting chemicals and other contaminants of emerging concern are broken down in that shallow soil layer. That is also where you get good reduction and removal of bacteria and viruses.

Someday someone may come up with a simpler gravity-fed system, but intuitively I don't think that will happen.

Pumper: How did the center begin?

Heufelder: In 1999, there was a proposal to put experimental systems in people's backyards, and I asked how the companies knew that these would work. And I said if they didn't then we would have citizens calling in the middle of the night because of failing systems. So we looked for a place to do tests.

At the same time, Joint Base Cape Cod (which holds the operations for eight branches of the Massachusetts National Guard, U.S. Air Force and U.S. Coast Guard) was replacing its old wastewater treatment plant. They were kind enough to give us space at the old plant site where we could install test systems in the ground, and they let us borrow some of the plant influent to feed our test systems. (Water is returned to the plant with a drain system to prevent any discharge.)

As I reviewed performance data from various commercial units, I was concerned about the data I saw. Everything coming out then had been tested in the South, and we wanted to make sure a New England winter would not slow these systems down.

(The U.S. Environmental Protection Agency) and the state provided

money to start the center, but it is now self-funding from the test fees charged to manufacturers. We have tested the systems of just about every major manufacturer, including some from outside the United States, and we have become one of the larger third-party testing beds. We supervise tests as much or as little as a company wants — from samples every hour and sending data daily, to looking at it and telling people if we think

Links

Massachusetts Alternative Septic System Test Center:

www.masstc.org

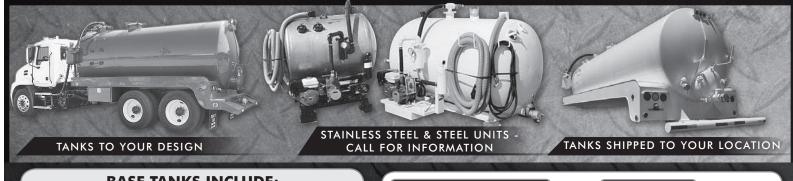
MASSTC tests by manufacturer:

www.masstc.org/projects-list

Septic system performance data: septic.barnstablecountyhealth.org/ category/data-and-statistics

something is wrong. We perform NSF tests on request, but we don't give a seal of approval like NSF. We do write reports at a manufacturer's request to summarize our data.

Our results — those that companies are willing to make public — are posted online, and people can also look at the performance of various types of innovative and alternative systems installed on Cape Cod. \blacksquare



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Jennifer FitzPatrick is founder of Jenerations Health Education, Inc. and the author of *Your 24/7 Older Parent*. Reach her at www. jenerationshealth.com.

9 Ways to Close the Generation Gap

When young bosses manage older workers — and vice versa — learning to appreciate each age group's attributes and skills is vital to a cohesive workplace By Jennifer FitzPatrick

ince mandatory retirement has long been abolished in most industries, we are living in a time in which multiple generations of employees work together. Healthy, seasoned octogenarians work alongside college interns and every age group in between. This age diversity in the workplace presents challenges in communication, expectations, work ethic, abilities and strengths.

While multigenerational co-workers struggle to understand each other, some of the most difficult situations involve managing a much older or younger staff. Younger managers sometimes categorize their older workers as slower and technologically deficient. Older managers tend to question younger employees' experience, maturity and work ethic.

For example, Samantha, a newly hired 28-year-old vice president of a small company, supervises David, a 52-year-old manager. She asks David to spearhead a project that will create a Facebook page for their company. He says he doesn't know much about Facebook but his teenage sons use it all the time. When David asks why the company would want a Facebook page, Samantha rolls her eyes and chalks his question up to David being behind the times.

Robert is a 61-year-old supervisor who constantly receives requests from his staff about having more flexible hours. Several of his employees are in their 20s and 30s and have young children, who need to be dropped off at day care in the morning or picked up after school. Robert tends to have less confidence in employees who want flexible schedules.

What can Samantha and Robert do to better lead their employees of different generations? Samantha could best engage David if she approached the Facebook situation with patience and additional training. Robert would likely inspire the most loyalty with his staff by being a bit more flexible. If he made an effort to put some work-life balance policies in place, his staff might perceive him as more reasonable and work even harder.

There are challenges from the subordinate's perspective as well.

While it's usually a mistake to underestimate a younger manager, many older workers do. Sure, it's possible that a younger employee might have been hired or promoted due to nepotism or other unjustifiable reasons. But typically, that younger person deserves the position due to education, experience, leadership potential or other abilities. Regardless, it's important to judge younger managers on merit rather than age. While a seasoned employee may resent a younger person coming in and telling him or her what to do, it is likely this person has something unique to offer.

Sometimes the resentment toward a younger boss has more to do with the older worker than anything the younger manager has done. Reporting to a younger manager can trigger feelings of inadequacy or old age, and regret for how an older worker's career has turned out. Older workers may think Age diversity in the workplace presents challenges in communication, expectations, work ethic, abilities and strengths.

back to when they began their careers and second-guess their choices. Older employees struggling to accept a younger manager should focus on getting along and supporting him or her as they would with any other boss.

In working with a boss of a younger generation, the older worker should: **Keep an open mind.** Almost everyone we encounter at work can teach us something. At the very least, most younger managers have fresh, new ideas that can invigorate the workplace.

Avoid discussion of the younger manager's age. When an older worker starts to compare the younger manager to his daughter or even grand-daughter, it can offend the manager. Younger managers know their age; they don't need older staff reminding them.

Refrain from too many references about the past. Younger managers will not appreciate older employees harping on the way "it's always been done" or the way things were "before you were out of diapers."

Make an effort to learn technology the boss uses. Not only will this impress a younger manager, it will increase the older subordinate's skill set.

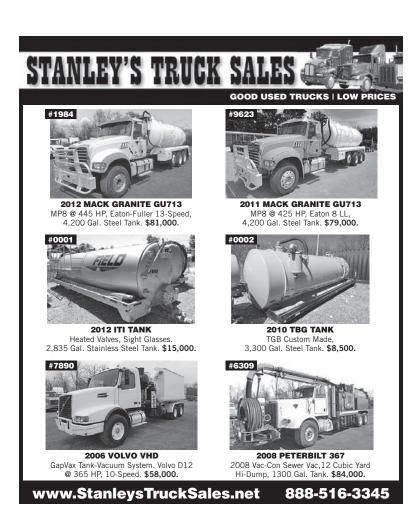
Accept this person as the boss. Ultimately, if the older worker wants to remain in the position or even be promoted, an attitude shift is critical.

Younger workers also have a challenge understanding their older managers. They find themselves frustrated when the older manager does not embrace technology, lives in the past or dismisses younger counterparts when they don't recognize pop culture references of previous eras.

In working with a boss of an older generation, younger employees should:

Respect the years of experience their manager brings to the table. Even when an older boss acts in a way the younger staff does not agree with, it should be acknowledged that the decision might be based on past learning experiences.

Understand that "face time" may be important to an older manager. It is common for older bosses to be less open to working from home or non-traditional hours because it was not something they had ever become comfortable with. If employees do have flexible schedules or work offsite, they may want to check in regularly and take steps to reassure the older manager that work is getting done.





Explain pop culture references to keep the older employee in the loop. A 20-something who mentions an incident he or she saw on a reality show should take the time to let his 60-something boss in on the joke.

Accept that meetings and phone calls may be preferable to social media. While many older workers embrace technology — Skype, email and instant messaging, for example — some favor more traditional modes of communication. Going with the flow on the boss' desired communication method will be appreciated by an older manager.

We will continue to see multiple generations collaborating at work. More retirees are re-entering the workforce for extra cash, and many older adults are delaying retirement indefinitely. With more high school and college graduates entering the workforce every year, it is important for workers of all ages to make an effort to understand and appreciate each other.

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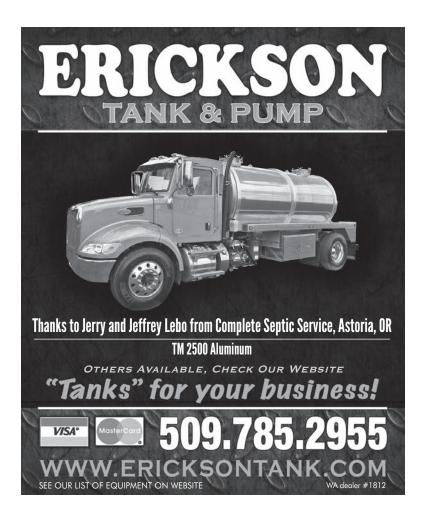
PortaLogix Service Truck Designers are Portable Sanitation Veterans

By Craig Mandli

ost have heard the age-old idiom, "If you want something done well, do it yourself." That idea was on full display at the 2016 Water & Wastewater Equipment, Treatment & Transport Show, as a group of portable restroom industry veterans from western New York showed off their self-made PortaLogix portable restroom service truck. According to company co-owner Jerry Vecchiarelli, the unit incorporates effective features and solves problems faced by PROs.

"We've been in the porta-potty business for a long time, and know what the formula is for success," he says. "We have used a lot of different service trucks over the years in our business, but never found one with all the features we wanted. That's why we designed one ourselves."

The truck allows a technician to service a route while carrying up to





six units without a trailer. Placement of the 800-gallon waste tank is designed to distribute weight evenly on the chassis, while the flat 350-gallon freshwater tank is located in the bed of the truck, below the restroom payload. It is built on a 1-ton heavy-duty truck chassis, which doesn't require a CDL to operate.

"The frame is made of durable aluminum to keep the weight down and allow the tech to

PortaLogix co-owners, from left, Larry and Bryan Moravec and Jerry Vecchiarelli discuss options available on their new service truck with an attendee at the 2016 WWETT Show. The unit carries up to six units without a trailer. (Photo by Craig Mandli)

to keep the weight down and allow the tech to carry more units and more waste," says Vecchiarelli. "We like to think that the unit is allowing companies to do more with less."

It comes with either a PTO-driven pump and high-pressure washdown pump unit or Honda prepackaged pump system. The bed has removable rails and multiple strapping points for various load configurations, and Thieman liftgates for easier loading. The flat-tank bed has a water level sight glass, V-channel baffles, and two drain points on both the driver and passenger side for easier draining on grades. The baffles help prevent sloshing, making the vehicle more stable at highway speeds. A fully loaded unit weighs in at 11,500 pounds with empty tanks, and 17,000 pounds with tanks full. The company has offered the units for sale since November 2015, and according to Vecchiarelli, the feedback has been overwhelmingly positive.

"People really like that we have several chassis options available in both two- and four-wheel drive, and many other component options," he says. "If they run their portable restroom businesses anything like we run ours, they are going to want to customize the service truck to suit their needs."

According to Vecchiarelli, his company runs 30 PortaLogix trucks in its fleet, and the feedback from his service techs has been glowing.

"These trucks can carry more because they're made lighter, which allows a tech to work all day on service runs," he says. "In the long run, that is saving time and money."

Vecchiarelli says that the 2016 WWETT Show exceeded his expectations, and he's already planning to come back in 2017 with an updated truck offering more customization options.

"We knew we had a good product, and the interest we received at the show confirmed that," he says. "It's justifying knowing that the issues we were dealing with weren't just ours, but shared by a lot of people in the industry. We designed this truck to help solve a lot of those." **585/484-7009**; www.portalogix.com.



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DeLancey Davis, vice president of Franklin Electric and president of North America Water Systems, was appointed to the Hydraulic Institute's board of directors.

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Virgo Fleet, a retail supplier of truck accessories, released an 84-page product catalog. Buyers can browse items in the catalog on the company's website, virgofleet.com.

Talbert Manufacturing appoints two vice presidents

Talbert Manufacturing promoted Jamie Myers to vice president of purchasing, and promoted Jim Hall to vice president of operations. Myers and Hall have more than 40 years' combined experience in the manufacturing industry.







Jim Hall

Isuzu produces 30,000th N-Series gas truck

Isuzu Commercial Truck of America produced its 30,000th Isuzu N-Series truck on June 10 at the Spartan Motors facility in Charlotte, Michigan. Assembly of the N-Series gas trucks began at Spartan in April 2011.

Wastequip announces dealer network for OEM parts division

Wastequip's Go To Parts division signed exclusive agreements with 10 dealers covering the South, Southeast, Midwest and Mid-Atlantic regions.

Hol-Mac Corporation announces expansion

Hol-Mac Corporation will add 40 jobs and invest \$5 million in expanding its operation in Bay Springs, Mississippi. A \$250,000 grant from the Mississippi Development Authority includes \$200,000 for equipment relocation and \$50,000 for workforce training.

Cortec celebrates 10th anniversary

Cortec, an advanced bioplastics manufacturer based in Croatia, is celebrating its 10th anniversary in 2016. The company reports it has tripled production of environmentally safe films for corrosion protection over 10 years.

SubSurface Instruments acquires distributorship for Fuji Tecom locators

SubSurface Instruments acquired the master distributorship for the entire range of Fuji Tecom pipe and cable locators.

Septic Services names national sales manager

Septic Services named Mike Copeland as national sales manager. Copeland has more than 20 years of sales experience.



Mike Copeland

Amthor International sponsors Global Tank Truck Conference

The first Global Tank Truck Conference, sponsored by Amthor International, will be held Oct. 6-8 at the Grandover Resort and Conference Center in Greensboro, North Carolina. The purpose of the event is to bring leaders, business owners and managers in the refined fuel, propane, portable restroom, vacuum and septic pumping industries together to share ideas about growth and diversification.

with the right pumper truck!



2015 114SD, TMV 5500 w/NVE 4307 Blower Package, Detroit Diesel DD13, Alison Automatic, Full Lockers, SOLD!



2016 114SD. Detroit DD13. Allison 4500RDS. 20K FA/46K RA w/Full Lockers. 5000 Gal Imperial Tank w/ NVE4307 Blower



2007 Western Star 4900SA, Florida Rust Free, 410 MBE, 8LL, Jake, 20/46 Axles, Chalmers, Double Frame, Full Lockers, 536440



2011 Freightliner M2106, 325HP Cummins, Allison 3000 Series, Air Ride, New 2500gal Imperial Tank. 531894



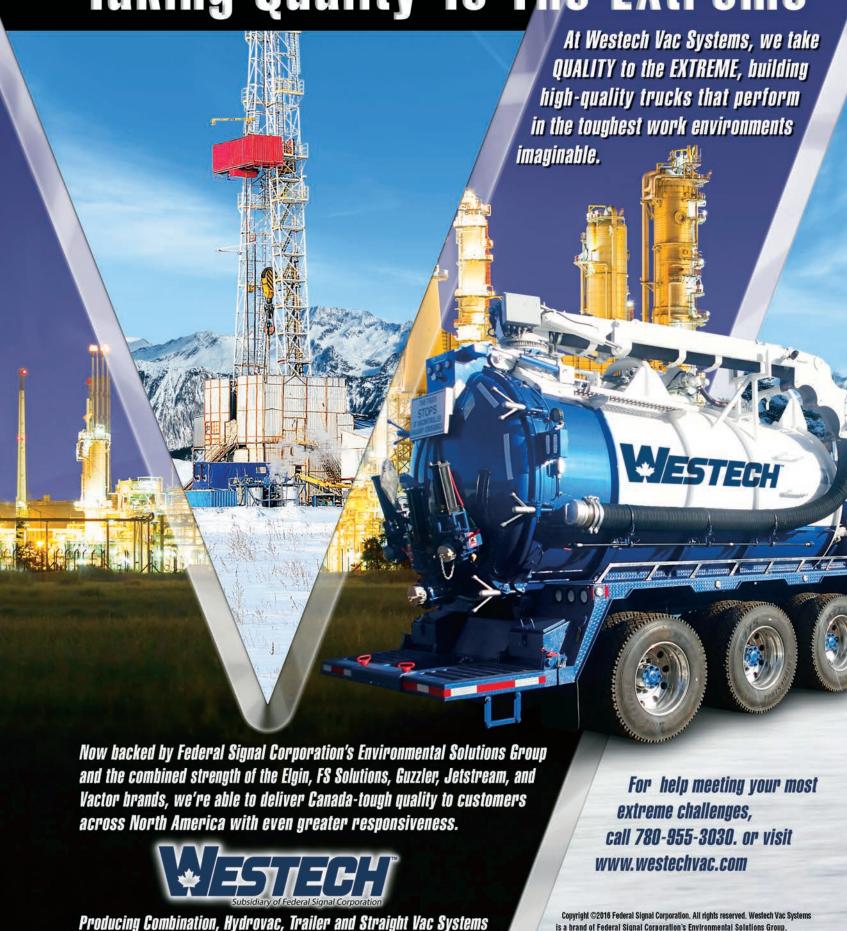
2017 M2-106 with New 4000 gal. Imperial Alum. Tank, NVE4307 Blower Package, 350 HP Cummins, Allison Auto., Air



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 - Optional Patz Conveyor To Move Trash to Dumpster

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- Lifts Stubborn Tapered Lids

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PROGRESSIVE CAVITY PUMP

- Geared motor, directly flanged to the pump
- Pin joint sealed with elastomeric boot
- rotation
- Stator has gaskets
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- Enlarged suction housing
- Housing can be completely drained
- 90° suction housing flange Low angularity connecting
 - Standard ANSI connections sized to ensure no 'dead zones' allowing complete
 - drainage

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	U/M	015-	045-	045-	065-	065-
		300SD	600SD	620HD	900SD	920HD
Flow Rate (Water)	GPM	26	88	88	132	132
	D. D.	11	11. 11	11. 17		

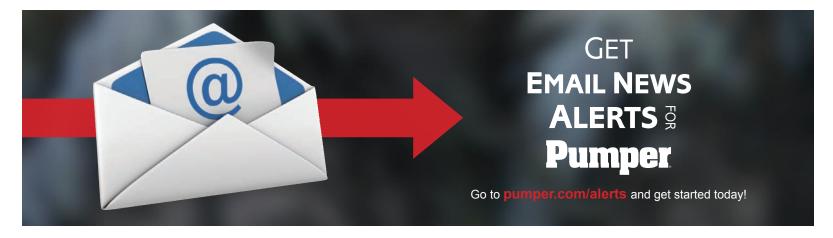


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- Works with above and below ground storage
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2016 Peterbilt Model 337 with 2,500 gallon vacuum tank

PACCAR PX-9 330 HP engine, Allison 3000 RDS-P transmission, Dana 12k front/21k rear axles. 2,500 gallon Pik Rite steel tank with Masport HXL 400 pump. Several units in stock.



2015 Peterbilt Model 348 with 3,600 gallon vacuum tank

PACCAR PX-9 350 HP engine, Allison 3000 RDS-P transmission, Dana 20k front/40k rear axles. 3,600 gallon Pik Rite steel tank with Masport HXL 400 pump. Stock # 393983.



2016 Peterbilt Model 348 with 4,000 gallon vacuum tank

PACCAR PX-9 350 HP engine, Eaton Fuller 10-speed transmission or Allison 3000 RDS-P, Dana 20k front/40k rear axles. 4,000 gallon Pik Rite polished aluminum tank with a Masport HXL-400WV or NVE Challenger 607 pump. Several units in stock.



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wner Mike Oberg added a purple 2015 Kenworth T880 truck with a 5,200-gallon aluminum tank and National Vacuum Equipment 4307 blower from Imperial Industries. The truck is powered by a PACCAR MX13 engine tied to a 13-speed Eaton transmission. Features include two 3-inch inlets and a 6-inch discharge, sight glasses, a temperature gauge, chrome stacks, aluminum wheels, dual aluminum toolboxes and a custom front bumper. Interior includes AM/FM and Sirius satellite radio, air-ride, A/C and power locks/windows. Steve Nobbe is the driver. The truck is used for residential septic and grease trap service.

SHOW US YOURS!

Got a truck with real WOW appeal? Show it off to *Pumper* readers!

Send photos of your truck after it has been lettered with your company name. Any industry-related truck is acceptable. Please limit

your submission to one truck only.

Your Classy Truck submission must include your name, company name, mailing address, phone number, and details about the truck, including tank size, cab/chassis information, pump information, the company that built the truck, and any other details you consider important. In particular, tell us what features of the truck help make

your work life more efficient and more profitable. Email your materials to editor@pumper.com or mail to Editor, *Pumper*, P.O. Box 220, Three Lakes, WI 54562. We look forward to hearing from you!



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FEATURES

STAINLESS STEEL

Vacuum truck tanks and trailers

2-, 3-, 4-axle tanker trailers

Hydraulic telescoping hoists

Full opening rear tank doors

Hydraulic drive systems

NVE vacuum pumps and blower systems

Standard models or custom built



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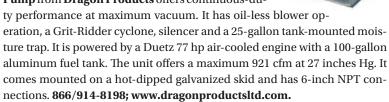
Hydroexcavation and Industrial Jet/Vac Services

By Craig Mandli

BLOWERS

DRAGON PRODUCTS SKID-MOUNT VACUUM/ BLOWER PUMP

The galvanized **Skid-Mount Vacuum/Blower Pump** from **Dragon Products** offers continuous-du-





NATIONAL VACUUM EQUIPMENT CHALLENGER 5314

The **Challenger 5314** high-vacuum blower from **National Vacuum Equipment** is a 1,500 cfm high-vacuum blower designed for continuous duty at maximum vacuum. It is available in a ready-to-install hydraulic or belt-drive package using corrosion-resistant stainless steel internal components. Available packages include silencers, check valves, moisture trap, cyclone, four-way vacuum/pressure change-

over valve and a powder-coated skid. 800/253-5500; www.natvac.com.

HYDROEXCAVATORS

DITCH WITCH FXT65

The **FXT65** vacuum excavator from **Ditch Witch** increases



power for large cleanups by optimizing airflow for performance output of 1,215 cfm. Powered by a 74 hp diesel engine, the truck has large-tank-capacity options, beginning with 500-gallon vacuum tanks and with 200-gallon water tanks. Its three-stage filtration system with cyclonic filter cleans the air prior to reaching the main filter for protection of key equipment components. It is designed for mobility and maneuverability on job sites, and to maximize use of the entire spoils tank volume without exceeding vehicle weight limits. Trailer models are also available. **800/654-6481; www.ditchwitch.com.**

FOREMOST FVS1000 HYDROVAC

The **FVS1000 Hydrovac** from **Foremost** is a compact unit designed to maneuver easily in urban environments while maintaining the productivity standards of the



company's larger models. It is mounted on a tandem-axle chassis and holds 1,000 gallons of freshwater and 7 cubic yards of debris. All working components are housed in a 42-inch aluminum, heated, insulated and lighted van body. A Robuschi RB-DV125 PD blower provides 4,000 cfm and full vacuum. The boom is 8 inches and operated by an Omnex wireless controller for control of vehicle rpm, the wash system, off-loading and vacuum functions. The water system has a CAT 3560 wash pump capable of 3,000 psi and 20 gpm, and is heated by a 740,000 Btu diesel-fired boiler. Off-loading is performed via a sloped debris tank, assisted by a washout system powered by a high-volume centrifugal pump. 403/295-5800; www.foremost.ca.



GAPVAX HV56

Constructed of 1/4-inch ASTM A572-Grade 50 steel, the **HV56** hydroexcavator from **GapVax** has a 15-cubic-yard debris body and water tank options ranging from 350 to 1,200 gallons. Its positive displacement blower is

rated 5,250 cfm at 28 inches Hg. The tailgate is fully opening with a field-adjustable hinge and dual cylinders, and also has four individually adjustable locks to ensure a complete seal. Options include a cold weather recirculation package, sludge pump, auger unloading system, body pressurization system, remote pendants and wireless remotes. It can be used for excavating, locating utilities, digging potholes, tunneling, slot trenching, conveying dry gravel and sand, or general cleanup. 888/442-7829; www.gapvax.com.

ITI TRAILERS & TRUCK BODIES HYDROEXCAVATOR

Hydroexcavators from **ITI Trailers & Truck Bodies** are available with a hydraulically driven agitating unit. When used with heavy solids, collected material can be kept suspended utilizing the agita-



tor, speeding the transfer of waste to a roll-off container, resulting in a 40 percent increase in capacity in each 24-hour period. The remote-operated boom allows for safe operation from an ideal or mobile vantage point. The Code unit comes with a full-opening rear door for easy clean-out, inspection and maintenance. The 304 stainless steel ASME/DOT407 tank is mounted on a full frame. A hydraulic-driven National Vacuum Equipment 5314 blower offers up to 1,600 cfm pressure/vacuum. Low noise impedance with hydraulic-driven power for the enclosed blower provides an atmosphere suitable for 24-hour operations. The unit can be mounted on a choice of chassis. **814/634-0080**; www.itimfg.com.

HYDROEXCAVATORS

LMT SMART-DIG HX-2100

The **SMART-DIG HX-2100** hydroexcavator from **LMT** is powered by a 59 hp Kubota VT2403



diesel engine that drives a 1,300 cfm Tuthill blower and 2,200 psi Udor water blaster. The compact design includes a 700-gallon debris tank and 300 gallons of freshwater. The trailer has a fully automatic rear-open door with wireless remote control for ease of use. Filtration is provided by the SMART-DIG dropbox and washable PTFE filters. An antifreeze winterization system is standard, and for colder climates and improved digging performance an optional diesel-powered water heater is available. 309/932-3311; www.vaxteel.com.



RING-O-MATIC HICFM 850VX

The versatile **HiCFM 850VX** 800-gallon-capacity vacuum excavator from **Ring-O-Matic** can be used for quickly and safely keyholing or pothol-

ing buried utilities, cleaning out storm drains, catch basins, drilling fluids and valve boxes, slot trenching, or assisting in environmental cleanup. The trailer-mounted version offers portability from a standard 3/4-ton truck, weighing less than 1,200 pounds fully loaded, and optimally balanced tongue weight. The tandem-axle, pintle-hitch-mount trailer is built on a heavy-duty, 8-inch C-channel frame for longevity. Vacuum power is supplied by a 15-inch, 1,000 cfm Gardner Denver blower and powered by a water-cooled 50 hp industrial CAT Interim Tier 4 diesel engine. 800/544-2518; www.ring-o-matic.com.

SCHELLVAC EQUIPMENT 2600 SERIES COMBINATION HYDROVAC



The **2600 Series Combination Hydrovac** from

SchellVac Equipment is designed to serve construction, energy and utility industries. The system is mounted on a tridem chassis and is equipped with a 6,400 cfm Robuschi PD blower direct-powered by a Namco transfer case. The water jetter system consists of a 3560 CAT (20 gpm/4,000 psi) pressure pump, 980,000 Btu boiler and 1,200-gallon water capacity. The complete water system is installed in an insulated and heated aluminum body. The hoisted 15 1/2-cubic-yard debris body includes a dual cyclone plus cartridge filtration system. It has a fully opening rear door with hydraulic locks, an 8-inch remote-controlled telescopic boom with a 27-foot reach when fully extended and a load-sensing hydraulic system. 877/336-0081; www.schellvacequipment.com.

SUPER PRODUCTS MUD DOG 1200

The **Mud Dog 1200** hydroexcavator from **Super Products** has a 12-yard debris ca-



pacity and a rear-mounted boom capable of 19- to 27-foot reach, 335-degree rotation, 45-degree upward and 25-degree downward pivot for greater work area access and deeper digging without halting production to reposition the trunk. It has easy-to-use ejector plate unloading technology, and the unit's tilt-unloading feature ensures liquids in the debris tank are cleared quickly and efficiently, even when unloading in an up-slope/nose-down position. An array of additional equipment options can be specified including the Acculevel load sensor system for precise debris tank level measurement. 800/837-9711; www.superproductsllc.com.



VAC-CON X-CAVATOR

The **X-Cavator** from **Vac-Con** features a hydrostatic drive that utilizes the chassis engine for vacuum, making the system less complicated and eliminating the need for cumbersome PTO, clutch and gearbox operation. It is available with water systems up to 4,000 psi, with a mobile

wireless remote system that enables the operator to work the chassis engine rpm, boom, automatic vacuum breaker, dump controls and hydraulic door lock from 1/2 mile away. The boom rotates up to 270 degrees. **904/284-4200**; www.vac-con.com.

TORNADO GLOBAL HYDROVACS F-3-ECO

The **F-3-ECO** from **Tornado Global Hydrovacs** holds 12 cubic yards of mud and more than 1,700 gallons of freshwater. This



unit is over 2,000 pounds lighter than the company's older models, meaning the operator can carry extra payload in the debris tank. The boom has a 342-degree rotation and a 26-foot reach. All critical components are housed in an insulated and heated aluminum van body. Operators do not need to hoist the tank to empty it, eliminating the dangers of dumping on uneven ground and overhead power lines. 877/340-8141; www.tghl.ca.

HYDROEXCAVATORS

VACALL ALLEXCAVATE

Three vacuum boom tube and hose design options are available on **AllExcavate** hydroexcavation models from **Vacall.** One design uses a flexible



heavy-duty full-length rubber hose with a gum rubber lining that runs from the turret mounted on the debris tank out to the pickup point. The second option has a steel tube-in-tube boom and intake that connects to an identical rubber hose elbow, which leads to the pickup point. The third option has a steel tube-in-tube with steel elbow boom and intake tube. The unit can generate up to 27 inches Hg and up to 5,800 cfm. Used in combination with the machine's high-power waterjetting forces, it can loosen and remove dirt and other material from around utility lines and foundations where mass excavation is not possible. 800/382-8302; www.vacall.com.

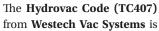


VACTOR HXX HYDROEXCAVATOR

The Vactor HXX HydroExcavator provides up to seven hours of continuous operation with onboard water. The standard variable-flow water system allows lower water flow,

resulting in less operator fatigue and a cleaner, more precise digging process. The system allows for up to 25 gpm for projects requiring higher water flow capabilities. Using the DigRight Technology, operators select the maximum desired working water pressure for their application based on vacuum excavation best practices. This selection will limit the water pump from exceeding site, industry or customer maximum pressures to ensure a safe and nondestructive method of excavation. DigRight Technology also reduces wear and tear on the water system, extending product life. Its boom turret provides increased vertical range of motion for improved operator performance and productivity, enabling the operator to complete most applications with only one dig tube. 800/627-3171; www.vactor.com.

WESTECH VAC SYSTEMS HYDROVAC CODE (TC407)





specified with a TC407 rating (hazardous goods transport capable). The truck allows quick access to buried water mains and natural gas and petroleum pipelines, cutting through hardened scale and frozen ground with reduced risk of damage. It can handle unpredictable off-road applications and unknown hazardous materials in every type of weather from freezing in winter to the heat and humidity of summer, from minus 40 to 95 degrees F. It is designed for quick and easy setup to maximize efficiency and productivity. Debris body capacities range from 11.8 to 13 cubic yards. It has heated reardoor valves, a heated hose reel cabinet and glycol and air purge winterization systems. **780/955-3030**; www.westechvac.com.

X-VAC, A PRODUCT OF HI-VAC CORPORATION, X-6 HYDRO EXCAVATOR

The truck-mounted **X-6 Hydro Excavator** from **X-Vac, A Product of Hi-Vac Corporation,** has a 6-cubic-yard debris tank and can store 570 gallons



of freshwater with an option for a capacity of 1,000 gallons. The adjustable triplex water pump exerts up to 3,000 psi and is set independently of the blower speed. Vacuum systems range in size from 2,600 cfm at 27 inches Hg vacuum to 3,400 cfm at 16 inches Hg of vacuum. Its 6-inch vacuum hose exposes any type or size of underground utility, especially in residential areas where space is tight and crews want to avoid blocking residential streets. 740/374-2306; www.x-vac.com.

HYDROEXCAVATION TOOLS

NOZZTEQ MONRO-JET

The **MONRO-JET** hydroexcavation nozzle from **NozzTeq** combines the power of a solid-stream pencil jet with the large coverage of a fan jet. Its circu-



lar water jet motion generates tremendous power at modest gpm rates, allowing the operator to move faster whether hydroexcavating, surface cleaning or cleaning sewer lines. It can be used for other types of surface cleaning such as concrete, steel, castings and large surface areas including line removal from runways. It can be modified for internal pipe cleaning of sewers and pipes of all types. An orbital design increases performance at a lower gpm rate and pressures as high as 36,250 psi. 866/620-5915; www.nozzteq.com.



SOIL SURGEON

The **Soil Surgeon** hydroexcavating tool fits any sewer combination truck equipped with a telescoping 6- or 8-inch boom. The tool has a 1-inch water connection. The operator controls water pressure and power through truck controls. It has a 6-foot Tuff Tube with handles to guide the unit down for potholing or side to side for trenching. Six jets boring inward cut the soil, while six boring outward bring the tube down. **949/363-1401**; **www.soilsurgeoninc.com.**

WATER CANNON HYDRO-EXCAVATION NOZZLE

Hydro-Excavation Nozzles from **Water Cannon** are rated to 5,800 psi and orifices up to size 20. The dynamic 0-degree stream of water spins at 2,000 rpm to form a 25-degree cone pattern



designed to rip through subsoil to expose underground utilities. The rotation helps avoid damage that can be caused by straight 0-degree static nozzles with an added benefit of the 25-degree cone spray hitting the surface at varied angles to increase productivity. 800/333-9274; www.watercannon.com.

CASE STUDY

SAND BLOCKAGE CLEARED FROM STORMWATER PIPE AT PRIVATE FACILITY

Problem: A private retirement facility in Sumter County, Florida, with more than 100,000 residents, has an expansive network of stormwater infrastructure to accommodate expansion. A 60-inch stormwater line had a large deposit of sand, blocking flow of water inside the pipe. The blockage was 375 feet from the closest access point on the street, and the pipe was in the middle of a residential neighborhood. The work needed to be performed in December, the peak month of Florida's seasonal residents and activities.

Solution: Polston Applied Technologies brought its PAT 949 Combination3 truck to the site and extended the jetter from the outlet to the sand plug. Using the waterjetting system and sand and grit removal process, the crew was able to jet the sand downstream to the downhole pump for removal. The sand and grit was filtered into a containment tank, then hauled away. Water used in the process was returned to the stormwater line.



Result: The sand deposit was removed,

flow to the stormwater line was fully restored and the work was accomplished in two days. Due to the guiet operation, the entire cleaning/removal process had almost no impact on neighborhood activities. 844/765-7866; www.polstonprocess.com.

JET/VAC COMBO UNITS

HOT JET USA VAC 'N JET SERIES

The Vac 'N Jet Series of drainline jetters from Hot Jet USA is



available with the choice of hot- or cold-water operation, 13 to 35 hp engines with electric start, a 12-gallon gas tank, 24-gallon diesel tank, full variable pressure and rear throttle control. General Emperor Series pumps supply outputs of 10 gpm at 4,000 psi. Vacuum systems consist of an all-steel 300to 800-gallon spoil tank, Gardner Denver Vac/Blower, a Colt 4-ton hydraulic dump, Centri-Clean filter system and a 24-inch fully opening rear hatch. With a 200-gallon water tank, the tandem-axle diamond-plated steel deck trailer is rated with two 5,000-pound-capacity axles and electric brakes. The unit comes with a variety of jetting and power-wash accessories. 800/624-8186; www.hotjetusa.com.

VAC-TRON EQUIPMENT MINI COMBO SERIES

The Mini Combo Series from Vac-Tron Equipment is available with an ARCTIC package, allowing for full operation in below-freezing temperatures.



The unit combines a high cfm vacuum with jetting capabilities, and comes with a Cat jetter pump rated at 2,000 psi at 15 gpm, and can be used to clean lateral lines up to 12 inches in diameter. It comes with 300 feet of 1/2-inch jetter hose with an electric hose reel. Options include a hydraulic boom or strong arm to maximize job performance by supporting the weight of the vacuum hose. It is available either trailer- or truck-mounted. 888/822-8766; www.vactron.com.

VACUUM PUMPS

FRUITI AND MANUFACTURING RCF 870

The RCF 870 vacuum pump from Fruitland Manufacturing is fully automatic with no adjustment necessary and environmentally friendly when used with Fruitland biodegradable oil. It offers free airflow of 500 cfm, a maximum vacuum of 28 1/2 inches Hg, 4-inch hoses, an operating speed of 1,400 rpm, eight

Kevlar vanes, and an approximate net weight of 575 pounds. 800/663-9003; www.fruitlandmanufacturing.com.

HOWDEN ROOTS 827 DVJ WHISPAIR

The 827 DVJ Whispair dry vacuum exhausters from Howden Roots eliminate problems associated with high temperatures at vacuum levels beyond 16 inches Hg. They can be arranged to operate in two- and three-stage systems. Their heavyduty design is suited for V-belt or direct-drive applications with integral-shaft ductile iron impellers. The

casing, headplates, gear cover and drive-end cover are gray iron. Carburized and ground alloy steel spur timing gears are taper-mounted on the shafts and secured with a locknut. Cylindrical roller bearings are splash-lubricated at both the gear and opposite gear ends of the unit. Piston rings reduce air leakage through the headplate bores and lip-type oil seals prevent lubricants from entering the air chamber. Steel mounting feet permit field adaptability to either vertical or horizontal installation requirements. 800/557-6687; www.howdenroots.com.

VACUUM PUMPS

MASPORT TITAN

The **Titan** vacuum/pressure pump from **Masport** has a washable stainless steel inlet filter for long filter life, integral mounting bosses for alignment with the gearbox and hydraulic mount, an automatic adjustment-free mechanical oil



pump, and heat-stabilized Kevlar vanes machined to exacting tolerances. It can achieve a minimum of 27 inches Hg, and is fan-cooled for higher continuous vacuum operations. It has heavy-duty bearings, Viton oil seals, vane wear inspection ports and durable translucent high-temperature oil lines that allow visible flow of oil to the pump. End Thrust Protection prevents rotor-to-end-cover contact created by direct PTO drive or misaligned belt-driven systems. It comes with 3-inch NPT bolt-on valve flanges for ease of installation, a 1/4-inch NPT vane flush port, integral vacuum relief valve, an integral valve that allows the pump to operate in vacuum and pressure mode and reduces plumbing and installation costs, and O-ring end covers that eliminate air or oil leakages. 800/228-4510; www.masportpump.com.

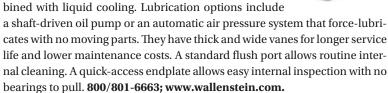
MORO USA PM80W WATER SERIES

The **PM80W Water Series** liquid-cooled vacuum pump from **Moro USA** is designed for industrial-duty applications. It has 29 psi positive pressure capability and can run at 24 inches Hg continuous and 28 inches Hg max intermittent, with a flow rate of 417 cfm. The suggested tank size is 2,000 to 4,000 gallons. It has Kevlar vanes, visual inspection ports and cantered rotor, which creates higher efficiency than traditional designs. It includes quality Viton oil seals, direct-feed oil-injected

lubrication and sealed or oil-injected bearings to eliminate grease points. It includes an integrated check valve, changeover valve and automatic oiling system, which along with low-speed rotation are designed to extend pump life under rigorous conditions. It is also available as a right-angle and enginedriven package. 800/383-6304; www.morousa.com.

WALLENSTEIN VACUUM PUMPS -ELMIRA MACHINE INDUSTRIES 750 SERIES

A larger off-load valve boosts performance on **750 Series** pumps from **Wallenstein Vacuum Pumps - Elmira Machine Industries.** They have 422 cfm airflow at 1,200 rpm and vacuum up to 28 inches Hg. Cooling options include air cooling (fan), liquid cooling (jacketed housing) or dual cooling, where air injection is com-



WESTMOOR LTD. CONDE VACUUM PUMP

Conde vacuum pumps and vacuum/pressure pumps from Westmoor Ltd. are available in a variety of sizes from 35 to 230 cfm. They have an automatic oiling system that never needs adjusting, and are offered with either a pump-mounted or remote oil reservoir, and sealed high-temperature bearings that require no mainte-



nance. Pumps can be driven by a variety of power sources, including gas or diesel engines, PTO, right-angle drive or hydraulic pump. All pumps are double shafted and can be set up for either clockwise or counterclockwise rotation. 800/367-0972; www.westmoorltd.com.

VACUUM TRAILERS/TANKS

ADVANCE PUMP & EQUIPMENT VFRSA-VAC

The **Versa-Vac** vacuum trailer from **Advance Pump & Equipment** has a 1,000-gallon debris hopper with either 1,400 or 2,200 cfm high-volume vacuum systems. The 74 hp or optional 110



hp Cummins power plant operates all components, including a high-pressure water system, trash pump system and remote-controlled full-function 6-inch vacuum boom, along with hydraulic endgate locks, tank hoist and vibrator. It is effective in loading product from depths of at least 50 feet. 877/557-7867; www.advancepump.com.



PIK RITE 5,300-GALLON ALUMINUM TANK

The 5,300-gallon aluminum tank from **Pik Rite** is split into three compartments, with the capacity for 300 gallons of freshwater, 3,800

gallons of wastewater and 1,200 gallons of graywater. Vacuum is provided by a National Vacuum Equipment 4310 blower system. Four-way valves for the inlets with pneumatic actuators allow switching between tank compartments while pumping. The jetter system is mounted in a heated toolbox for cold weather operation. It has a large rotating vacuum hose storage reel and a digital level indicator, and a remote control system for the blower system, jetter, pneumatic valves and hose reel. It comes with polished aluminum hose trays, a heavy-duty rear bumper with toolboxes and drip pan, an LED running light kit, work lights and safety beacon. 800/326-9763; www.pikrite.com.

TANKFORMATOR ISO ECLIPSE 1

A clip on the front of the ISO ECLIPSE 1 tank container from Tankformator allows it to be a plug-and-play vacuum tank with no dependence on an accompanying vehicle. The clip-on unit contains a self-sustaining powered vacuum package. The pri-



mary shut-off is fitted inside the tank and the secondary shut-off on the exterior of the ISO tank. The tank unit together with the clip enables operators to use regular container road transport vehicles and container trailers. When jobs require 24/7 vacuum extraction, the unit can be off-loaded on site. Clipon powered vacuum units can be used in succession for higher capacity. www.tankformator.com.sg.

WATER PUMPS

CAT PUMPS MODEL 660

The **Model 660** from **Cat Pumps** delivers 10 gpm up to 3,000 psi in a compact, lightweight package to work for trailer hydroexcavation units and other applications requiring lower flow but industrial-grade quality. A nickel aluminum bronze



concentric plungers provide a true wear surface that extends seal life. Highermass plungers offer superior heat dissipation, virtually eliminating plunger rod cracks. Durable V-packings are lubricated and cooled by the liquid being pumped. It is also offered in a stainless steel duplex model for aggressive fluids. It has 3/4-inch inlet ports and 1/2-inch discharge ports, and may be pulley-mounted on either side of the shaft. **763/780-5440; www.catpumps.com.**



GALWAY PUMPS TRANSFER PUMPS

Transfer pumps from **Galway Pumps** have seal- and bearing-less designs that offer longevity, simple maintenance and affordable parts. They are available in any standard length from 40 to 57.5 inches, with custom lengths available. They are

available in CPVC, PVDF, Polypro and stainless steel materials. Wetted surface materials such as stainless steel or Hastelloy shafts and Viton or Teflon Orings are available. Typical applications include a variety of caustic, acid and plating solutions. Drives are available in rugged electric and air drives. Electric drives are available in dual- and variable-speed options. Universal electric drives are rated for continuous duty and up to 50 gpm. Pumps are heavy-duty, affordable, and simply constructed to allow for ease of disassembly and assembly for routine maintenance. All components are CNC-machined to exact tolerances. 800/800-7867; www.galwaypumps.com.

HYDRA-TECH PUMPS S4T

The compact **S4T** 4-inch hydraulic drive submersible trash pump from **Hydra-Tech Pumps** is designed for versatility with an ability to pass large solids to tackle many jobs, which can range from construction site dewatering to sewage and slurry pumping. It operates with HT15 to HT25 power units, or other hydraulic power sources capable of flows of 10 to 15 gpm. It delivers output flows to 800 gpm, heads to 110 feet and pressure up to 3,000 psi. The safe and variable-speed hydraulic drive can be used where electric power is hazardous or impractical. **570/645-3779**; www.hydra-tech.com.

WET/DRY VACS

FAST-VAC SHUTTLE

The 16-cubic-yard **Shuttle** roll-off/lift-off vacuum loader from **Fast-Vac** has the capacities and



functionality of a truck-mounted vacuum, but without the maintenance of a truck. It is suited for refuse applications, industrial cleanups and spills. Multiple units can be moved with a single truck. **262/878-0756**; www.fast-vac.com.



GUZZLER MANUFACTURING CL

The Guzzler CL industrial vacuum loader from Guzzler Manufacturing is available with a dense-phase off-load option for jobs like moving powders, such as cement and lime, into large silos. The truck has

a high-pressure 14.5 psi, direct-drive cyclo-blower rotary pump with up to 750 cfm of free air displacement. The system pneumatically conveys material through a 4-inch hose up to 125 feet vertically. The rear of the dense-phase off-load configuration has a transfer cone with six fluidizing nozzles that fluff material into the air stream for improved handling of materials. The vacuum system operates effectively in remote or inaccessible locations more than 1,000 feet away. Simple to operate and easy to maintain, it provides 100 percent accessibility to all internal chambers and a low air-to-cloth ratio. It is available with a vane pump pressure off-load system (high pressure, low airflow), which is ideal for the vacuum loading of liquids, sludges and thicker materials. 800/627-3171; www.guzzler.com.

IMPERIAL INDUSTRIES VAC3000

VAC3000 trucks from Imperial Industries are ASME-certified 407/412 steel DOT units with capacities of 3,200 and 3,600 gallons. Choose either a blower system (National Vacuum Equipment 4310 or Hibon 820) or a



vacuum system (Fruitland, Moro or Wittig). The units feature three rollover bars, bolt-on aluminum hose trays, 4-inch riser intake, 6-inch discharge, full-opening rear door, three-stage hoist assembly and a complete hydraulically controlled system. **800/558-2945**; www.imperialind.com.

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PRESVAC LIQUID VAC

The **Presvac Liquid Vac** with fullopening door and dumping tank can be configured to suit a broad range of applications, including collection and transport of hazardous and nonhazardous liquids, slurries and sludges, septic system cleaning, line jetting and

material transfer. A full-opening door and large tipping angle make tank clean-out easier. Vacuum pump options include full vacuum of 28 inches Hg, and 200 to 1,500 cfm. Tank volumes are available in 500 to 5,500 gallons. Tank material options include carbon steel, or 304, 316 or 316 high-polish stainless steel. Options include a water pump, transfer pump, custom hose trays and toolboxes, and heated valves. 800/387-7763; www.presvac.com.

VACUTRUX LIMITED SEPTICTRUX

SepticTrux from **Vacutrux Limited** are available on chassis from



33,000 to 86,000 GVWR single axle, tandem or tri, with tank sizes from 1,800 to 5,400 gallons. Vacuum systems are powered by Wallenstein vacuum pumps. 800/305-4305; www.vacutrux.com.



VECTOR TECHNOLOGIES VECLOADER HEPA VACS

VecLoader Hepa Vacs from Vector Technologies are powerful, self-contained, critical-filtered vacuum systems capable of conveying regulated materials including asbestos and nuclear-contaminated solids, slurries, powders and liquids. High pow-

er allows maximum vacuum performance for long-run vacuuming within high-rise buildings, tunnels, confined areas and crawl spaces with single or multiple smaller-diameter hoses. All processed air within the fully enclosed negative-pressure system is thoroughly scrubbed by a four-stage filtration process. All collected materials are easily bagged through a discharge valve at the operator's workstation. Many models can be towed with hose and accessories by a 1-ton truck. 800/832-4010; www.vector-vacuums.com.





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The **EnviroFin** passive onsite wastewater treatment and dispersal system from **Presby Environmental** is designed for residential and commercial applications. The 50-pound system offers the same advantages as the Advanced Enviro-Septic product but is easier to ship and can be installed in even tighter spaces.

"They're fitting into lots and create solutions for sites that previously were either very expensive or just not able to build on at all," says Lee Rashkin, vice president of Presby Environmental. "A three-bedroom house can fit into a 93.5-square-foot area. It's really revolutionary. And, for the first time ever, we can ship somebody their septic system in the mail."

Effluent leaves the septic tank and enters the system, which consists of a center fin distribution unit and eight treatment fins filled with randomly oriented green plastic fibers and a perforated pipe acting as an air duct. The effluent fills the FDU until it enters the treatment fin through perforations around the unit. The unit is buried in System Sand, a C-33 concrete sand, and is installed with differential vents for airflow.

"It's not only a septic system, but it's a treatment system. You're getting treatment and dispersal in the same footprint," Rashkin says. "The pipes that we use, the green fibers, the geotextile and the system sand — they all have progressively smaller orifices. As the effluent moves through the smaller orifices, the membranes strip away the suspended solids, allowing the bacteria to collect on the membranes' surface area and digest the effluent. Because we surround it with that C-33 very coarse concrete sand, you're able to get oxygen to the outside of those membranes; you're keeping both sides of your membranes aerobic the same way membrane filters do."

The system has no mechanical parts, does not need chemicals or have energy requirements. The product has passed and exceeded the NSF 40 protocol, according to Rashkin.

"A lot of what our industry struggles with in regards to treatment is the maintenance component," Rashkin says. "We have online training and certification courses to make sure they know how to install it correctly. Above and beyond that, there's no special technical skills needed to use this system, so it's ideal for people who don't want to have those burdensome maintenance contracts."

800/473-5298; www.presbyeco.com.

VAC2GO CERAMIC-LINED PORTHOLE ELBOWS

Ceramic-lined porthole elbows from Vac2Go are designed to last longer than steel porthole elbows and reduce downtime. Ceramic-lined elbows feature wear resistance, extending



the life of vacuum truck fittings. Elbows are available in 45 and 90 degrees. **855/822-7426; www.vac2go.com.**



COXREELS STAINLESS STEEL REELS

Stainless steel and powder-coated steel reels from COXREELS are available in either 316 or 304 grade to best match the necessary corrosion resistance of the reel according to the application. **800/269-7335**; www.coxreels.com.

FRANKLIN ELECTRIC GRINDER PUMPS

IGP Series grinder pumps from Franklin Electric operate across 208 to 230 volts. The IGP-A (automatic) and IGP-M (manual) are designed to handle low-pressure sewage applications and feature a cutter system that operates at 414,000 cuts per minute. Other features include a non-clogging, corrosion-resistant brass impeller with a shut-off head of 130 feet and a 2 hp single-phase, 3,450 rpm start/run motor with built-in overload protection. **260/824-2900; www.franklinwater.com.**





SUPER PRODUCTS WASTEWATER RECYCLING SYSTEM

The Camel 1200 sewer cleaner from Super Products features a wastewater recycling system designed to save operators wa-

ter, time and money. A six-stage water filtration process enables effective sewer cleaning without the need to refill the freshwater tank. An injector plate serves as a primary filter that separates solids from liquids collected in the debris body (12-yard capacity). The collected water then travels through a series of filters, strainers and a separator that removes particles from the liquid via centrifugal action. The unit also features a water pump designed for wastewater recycling and high-pressure applications. 800/837-9711; www.superproductsllc.com.



McLAUGHLIN UTILITY LOCATOR

The Vermeer Verifier G3 utility locator from McLaughlin features a durable design with antennas mounted in rubber isolators for tough job site

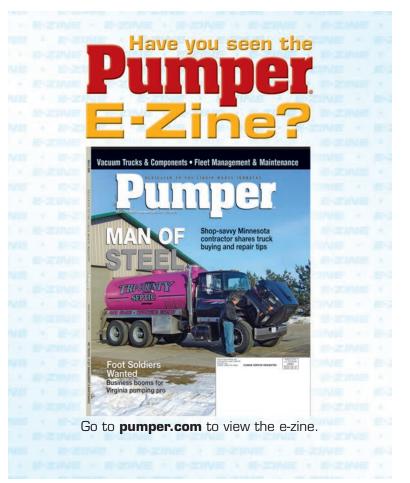
conditions. A new combination screen eliminates the need to toggle between two screens. Users can engage the semiautomatic gain on urban or congested job sites where signal distortion is common, or use the manual gain method when working in less congested areas. Estimated depth is automatically displayed. A compass icon provides straightforward visual representation of a utility's position in reference to the receiver. 800/435-9340;

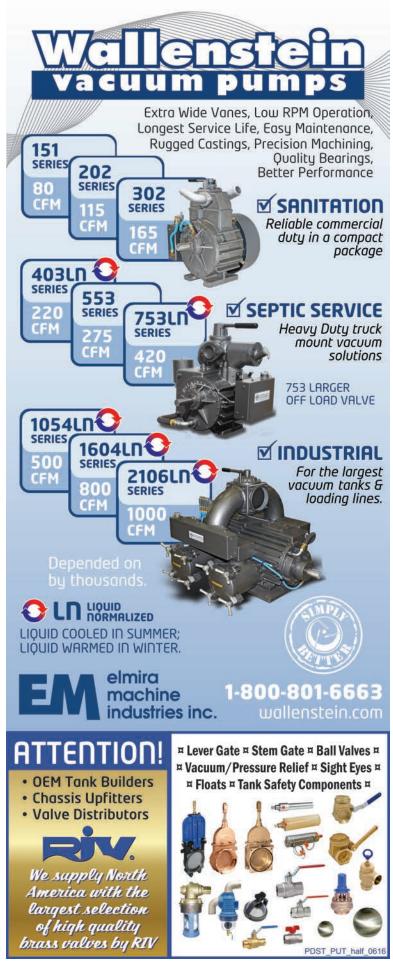
www.mclaughlinunder ground.com.

DITCH WITCH BACKREAMER

The Sandhog HD backreamer from

Ditch Witch is compatible with the JT9, JT20, JT25 and JT30 horizontal directional drills and is designed for soft and sandy soils. Aggressive cutting, mixing and packing combine for more efficient pullback on the job. Carbide cutting teeth and spiral plates further improve pullback efficiency and lower torque while maximizing the capacity for fluid flow. A barrel-shaped body is designed to better sculpt a true-to-size bore path. Replaceable, hardened steel nozzles increase fluid flow flexibility. The backreamer is available in 2 3/4-inch shaft size with 2 IF threads and 3 1/4-inch shaft with 2 3/8 API threads ranging in diameter from 8 to 18 inches. 800/654-6481; www.ditchwitch.com.





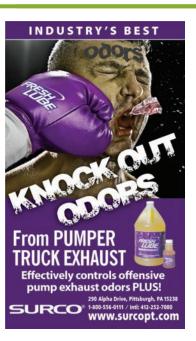














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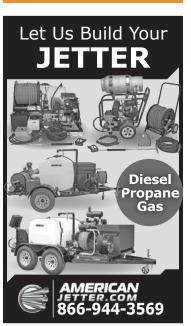














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For Sale: Established septic pumping business currently operating in west-central Minnesota with a substantial customer base. 2000 Freightliner with 3,200-gallon Engle tank and all the equipment needed to maintain septic systems in MN, additional equipment, porta-potties, etc. **Price reduced** - \$160,000. Call 320-249-8341 for more information. (P09)

FOR SALE: Portable Toilet Business. Very lucrative in the Chicagoland Area! Approximately 500 units, 52 HC-ADA, 40 sinks, 5 family units. Almost all equipment less than five years old. 3 trailers, 2 pumpers, 1 pickup truck. Hotsy pressure washer new 10,000 and many miscellaneous toilet parts. Owner has been in portable toilet business for over thirty-five years and has knowledge of where all contracts are in and around city. This business would be a great add-on for a recycling/garbage company. Please call 630-788-8007. (P09)

Portable toilet rentals in Westchester County, NY. Established 14+ years. Gross sales \$160,000+. Over \$100,000 worth of equipment including 250 toilets, 2 trucks, 10-spot bathroom carrier, comfort trailer and more. Turnkey business includes all contracts. Owner willing to help with transition. \$195,000 for all. Serious inquires only. Email outhouseinfony@qmail.com (P10)

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2007 International CF500 diesel. 132,000 miles. 800-gallon single tank with new Jurop/Honda pump system. Call for more info. \$24,500 0B0

541-410-6707, OR P10



1996 International pumper - 500-gallon waste and 250-gallon fresh. Conde pump. Automatic transmission. \$8,500. 1999 International 4700 T444E pumper - 500-gallon waste and 250-gallon fresh. Conde pump. Automatic transmission. \$12,000. 1995 Chevy Kodiak pumper - 1,000-gallon waste and 250-fresh. Automatic CAT diesel. \$15,000.

Rich 724-747-1141, PA

2005 Ford F450: 6.0 diesel, 235,000 miles, 300-gallonwaste/150-gallonfreshwatertank. 928-667-0021 (P09)

2007 Isuzu NPR: 600-gallon waste compartment, 350-gallon freshwater compartment. 60 cubic feet of dry storage space. 108,000 miles. Place to handle 4 portable bathrooms. \$32,000. For more information please contact rauny@thejnet.com. (P09)

2014 RAM 5500 pumper truck: 126,000 miles, 1,250-gallon aluminum tank 300/950. \$53,000 OBO. 218-391-8882 or 218-591-1736 (P09)

For Sale: Four (4) Ford 2007 F-550 pumper trucks. Each truck has a 1,000 waste/300 fresh tanks. They have Masport pumps, (2) portable restroom carrier and all required hoses. Trucks have been well-maintained and have high mileage. Call for more information and pricing. 956-842-3603. (P09)

2012 International TerraStar: 130,000 miles runs and drives but runs rough. 750 Crescent tank with split 300 fresh tank. \$25,000 OBO. Call/text 610-310-7384. (P09)

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 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)

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)

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)

2005 Ford F750: diesel, auto., air brakes. Recently repaired Cummins. Dual-service Satellite aluminum tank 1,200 waste/800 fresh. Masport pump. www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PBM)

2004 Ford F550: diesel, 6-speed manual, 64,000 miles, new aluminum 700-gallon vacuum tank, Honda engine-drive vacuum pump. www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PBM)

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greasemgmt@gmail.com P09

Portable restroom professional in Western USA. Strong operational experience with P&L responsibility required. Excellent people skills and deep industry knowledge required. Send resume to Prohelp2016@vahoo.com (P10)

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4 PBM

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2001 Freightliner: 6-speed manual, 2,500-gallon tank w/rear dump, heated valves, Battioni 8000 vacuum pump. Ready for work. \$25,000 0B0. 724-837-6084 (PBM)



405-422-2077, OK

P09



2012 and 2014 International 4300s with Duramax. Both automatic shift with 2,500/200 tanks. Jurop RV360 pump. Each has jetter system. Low miles.

318-780-1731, LA P10



Turn-Key Vacuum Tank Units: 3,600-gallon, 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 www.texlaservices.com

2000 Freightliner Century cabover, Detroit 60 Series, 10-speed Eaton Fuller, \$40,000 2006 Freightliner Business Class M2, CAT 7, 6-speed Eaton Fuller, \$50,000. Both come with 100' hose, a/c, heat. Every day workers. Company downsizing. Pictures upon request. James 713-992-0916 (P10)

2004 International DT466: 182k miles, rebuilt engine, auto transmission. 2012 2,500-gallon Imperial steel tank, aluminum wheels and cat walks. Masport 400 pump, posi-traction, heated valves, receivable hitch, backup camera, freshwater and more. VG condition. \$38,000 0B0. 715-874-6680 WI (P09)



740-259-5555. OH



612-559-3456, MN



Seth 330-231-5943, OH

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. Contact Frank@Action KingServices.com or 978-452-7750. (PBM)

2005 International 4300: DT466 motor, 2,500-gallon, 200k miles, Masport pump. \$45,000. Call/text Mike 937-408-4111. (P09)

2000 GMC C7500 with Imperial 2,500-gallon tank and MEC 8000 pump. CAT 3126 engine. Auto transmission. 33,000 GVW. Call 715-572-4250 (P09)



2004 GMC 7500: Duramax diesel, 250hp, 6-speed manual. 1,700-gallon vac tank, Jurop pump.

www.pumpertrucksales.com
Call JR @ 720-253-8014, CO PBM



NEW 2015 International 7300 with warranties, MF-DT engine, 230hp, 6-speed, new 1,850-gallon vacuum tank, new WV75 Masport pump. Under CDL.

www.pumpertrucksales.com Call JR @ 720-253-8014, CO PBM



2015 Peterbilt 367: 80k miles, 5,000gallon tank, NV 4307 blower, hoist. Excellent condition.\$200,000 Firm

For more details Call John @ 888-345-8848 P10



276-620-0533, VA

2008 Freightliner M2 Business Class: MBE Allison, 98,500 miles. New steel 2,500-gallon tank, new Jurop R260. Jake, p/w, p/l, a/r, air suspension. \$60,000. www.waste waterman.com jdsiter@yahoo.com (P09)

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SEPTIC TRUCKS



1993 Peterbilt 377, 350hp Detroit 60 Series, 9-speed, 3,600-gallon steel tank, tri-axle, NVE 607 pump. Nice truck. Used daily. \$50,000

276-620-0533, VA

PN9



1995 International DT4900 vacuum truck for sale. 2,500-gallon tank. Motor rebuilt at 279,822 miles (have receipts). Installed new radiator at 279.822 miles (have receipts. New stater, electric reel jetter with 200 ft. hose, 100 ft. vacuum hose. Masport liquid- and oil-cooled pump, 4 in. intake/discharge. Great truck, just upgraded to a truck with a larger tank. \$25,000

336-848-9137, NC

P09

2001 Mack RD 688S: Strong running truck in good condition. Motor re-man'd by Mack in 2004. New motor with ONLY 170,000 miles. Equipped with NVE 866 liquid-cooled pump. \$74,000. Call for more info. 570-745-3838.

2005 Peterbilt: One owner, 136k miles, single-axle chassis. Holds 2,375 gallons sewage/225 gallons freshwater. Steel tank & full tilt/dump, jetter. \$55,000. For pictures/more information please email clarkreaves@hotmail.com

Pre-owned 3,000 U.S. gallon carbon steel vacuum tank with a Masport H75W vacuumpressure pump installed on a 2000 Mack CH613 cab and chassis. (Stock# 8498C) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)

1992 International 2654 with a 4,000-gallon, carbon-steel unit. (Stock# 6246C) www. VacuumSalesInc.com (888) VAC-UNIT (822-8648)

New 4.000 U.S. gallon aluminum vacuumpressure tank. Mounted on 2016 Peterbilt 348 cab and chassis with a Masport HX-L400WV vacuum-pressure pump package. (Stock# 13670) www.VacuumSalesInc. **com (888) VAC-UNIT (822-8648)** (PBM)



2004 Sterling: 350hp CAT, 8-speed w/LH, 4.000-gallon aluminum tank. Masport pump, hose trays, tool basket, 4" & 6" valves. Above average unit, bought new. \$56,500 OBO

Kenneth 865-577-1157



1994 Kenworth T800 sludge/vacuum truck. Full-open rear door with tank hoist, Masport 400cfm pump, 3,000-gallon waste, 300-gallon fresh. New paint on tank. Truck runs good. \$44,500

208-955-8514. ID



2002 GMC Kodiak with Abernathy 3,300-gallon septic/grease tank. CAT with automatic transmission, 45,000 miles. Excellent condition. \$42,500

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2000 International 2674 triaxle with 4,000 waste/200 water, Wittig RFL100 vacuum pump and Harben jet pump system. (Stock# 9982V) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648)

New 4,000 U.S. gallon aluminum vacuumpressure tank. Mounted on 2016 International 7500 cab and chassis with a Masport HX-L400WV vacuum-pressure pump package. (Stock# 13665) www.VacuumSalesInc. com (888) VAC-UNIT (822-8648) (PBM)

2008 International 4300 with 2.500 C/S vacuum tank unit and Masport pump with washdown-type system. (Stock# 1537C) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648)

2006 GMC 7500: Duramax diesel. 210hp. Allison auto., under CDL. New 1,850-gallon vac tank, build in progress. www.pumper trucksales.com, Call JR, @ 720-253-8014.

1987 Kenworth T600A: CW CAT 6-cylinder. Eaton-Fuller 15-speed. 8-bag A-R suspension. 3,365-gallon vacuum tank, Masport 75 pump. \$31,000. www.pumpertrucksales.com. Call JR. @ 720-253-8014. CO.

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. 1994 Peterbilt 377: Detroit Series 60. 10-speed transmission. 3,365-gallon vacuum tank, Masport HXL pump, www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO.

2007 International 4300: 466DT, 6-speed, 60,0000 miles. New 1,650-gallon steel tank and Masport WV75 pump installed in 2016, used five times since. Under CDL. www. pumpertrucksales.com. Call JR. @ 720-253-8014. CO.

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P09



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> Call 269-751-5167. MI PBM

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Pre-owned 2.000 U.S. gallon, stainless steel vacuum tank with a Masport HXL75V vacuum pressure pump package (Stock# 6008C) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)

2004 Presvac 2,500-gallon, aluminum vacuum tank only. (Stock# 6864V) **www.Vacuum Salesinc.com (888) VAC-UNIT (822-8648)** (PBM)

Vacuum Tanks - New: Sizes from 1,000-4,300 gallons. All complete! Delivery available. **www.JEagleTanks.com.** Contact Jerry: **JEagleTanks@yahoo.com** or **800-721-2774.** (PBM)

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Septic pumper and vacuum die-cast toy trucks: In your choice of colors and logos, several cabs available. Call 877-450-2100, write to Granite State Collectibles, PO Box 440, New Ipswich, NH 03071; or www. granitestatecollectibles.com. (PBM)

TRAILERS

2002 Peterbilt 379 tractor with Wittig RFL100 pump package – Presvac 5,460 C/S vacuum tank trailer. (Stock# 0197C) www. VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)

TRAILERS-VACUUM/TANKER



6,000- and 6,300-gallon aluminum singlecompartment Imperial vacuum trailers.

> Call Kyle 800-558-2945 Ext. 424 PBM

2002 Super Products Camel 3-cubic-yard vacuum trailer with Roots 412 blower package. (Stock# 0197C) www.VacuumSalesInc. com (888) VAC-UNIT (822-8648) (PBM)

2002 Peterbilt 379 tractor with Wittig RFL100 pump package – Presvac 5,460 C/S vacuum tank trailer. (Stock# 0197C) www. VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)



Two 5,500-Gallon vacuum tankers for sale. One w/new motor and pump with less than 1,000 hours. Ready to work! \$25,000 for both.

Call 423-240-9737. GA P09

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 Companies 617-909-9044 (PBM)

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TRUCKS - MISCELLANEOUS



419-262-7232

VACUUM LOADERS

2014 Freightliner 114SD with a Vacall AVRB-18 industrial vacuum loader. (Stock# 9116C) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)

2009 Sterling LT9500 with a Vacall AVRB-18 industrial vacuum loader. (Stock# 4792C) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)



1999 International Guzzler vacuum excavator: Totally refurbished, purchased new for Big Dig Project. 27" blower, CAT engine, auto remote. Special noise-suppression equipment. Tri-axle. High-pressure wash-down system - 300-gallon water tank. \$99,500 OBO. Also available 1997 Ford Guzzler vacuum excavatorsame features as 1999 International. No washdown system. \$99,500 OBO.

617-212-0162, MA

P09



2006 Freightliner Vactor 2110-15: C-9 CAT (not running), Roots 821 PD blower, 46k rears. Power company truck.\$13,875

814-696-4343. PA

-696-4343, PA

2001 GapVax HG57 WET/DRY on Volvo WG64, 5,500 cfm, 27" Hibon blower, Cummins engine, chassis tank and bag house, in good condition, ready for work. KLM Companies 617-909-9044 (PBM)

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Looking to purchase vehicles/equipment that may no longer be wanted/needed from local companies. Cash buyer. Please call 508-868-7627. (P11)

We are looking to purchase used portable toilets and half-high toilets. Please contact Lance at 561-346-9296 or lance@redtoilets.com (P01)

Wanted to Buy: Vactor 2100s and late model Guzzlers. Cash. Phone 800-336-4369. (PBM)

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Gardner Denver T-375M: Bare Shaft pump. Gardner Denver T450M Bare Shaft pump NLB 20-200: 12 gpm @ 20,000 psi. Gardner Denver LC-1500: 390 gpm max, 15,000 psi max. NLB 36-200 6 gpm @ 36,000 psi. HT-150S 25 gpm max 10,000 psi max, Shell Side Machine, Wheatley 165: 30 gpm @ 10,000 psi, Wheatley 165: 17 gpm @ 20,000 psi. Wheatley 125 with aluminum bronze fluid end. Boatman Ind. 713-641-6006. View @ www.boatmanind.com. (PBM)

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