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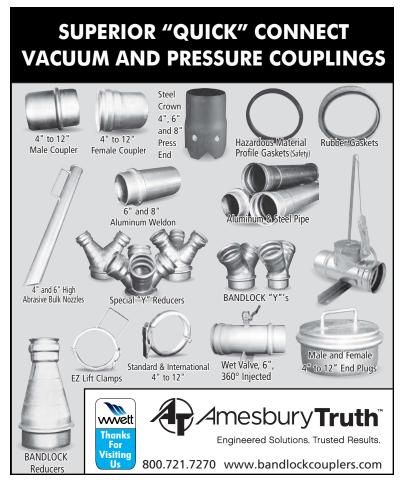




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IN THIS ISSUE March 2016



A Winning Combination

- Scottie Dayton

For Canada's Mike Clark, installing and pumping go hand in hand to better serve a rural customer base.

ON THE COVER: A healthy balance of septic pumping and onsite repair and replacement work built a successful, diversified wastewater business for Canadian contractor Mike Clark. Clark is shown on a system repair job with his company's Kubota KX121-3 excavator. (Photo by Bruce Bell)

10 Reading Between the Lines: **Do-It-Yourself Inspections: Penny-Wise** and Pound-Foolish

In Washington state, homeowners can watch a 24-minute video and become certified to inspect their own septic system. But is that a smart thing to do?

- Jim Kneiszel, Editor

14 @pumper.com

Check out the latest online-only content at the Pumper website.

26 Building the Business: 5 Tips to Make Your Social Selling Take Off

Online networking can help you get to know potential customers for pumping and portable sanitation services.

- Jeff Haden

30 State of the States: Making Connections is a Key to Successful Lobbying

Virginia wastewater professionals build strong relationships with regulators.

- Doug Day

34 Rules & Regulations

More sophisticated wastewater systems will improve health of Alaska citizens.

- Doug Day

38 Strive for Success

Dedication to customers and crew members plus an efficient marketing plan keep the work coming to Georgia's Affordable Septic Service.

- David Steinkraus

46 Pumper Interview: Educate Waterfront **Homeowners About Septic System Woes**

Kentucky program works to identify and address a growing number of problem onsite systems before E. coli works its way downstream.

- David Steinkraus

50 Septic System Answer Man: 'Septic Systems Will Take Care of Themselves.' Wrong!

The Answer Man says: Don't believe everything you read in the papers.

- Jim Anderson

54 Money Manager: Avoid Tricks and Traps of the Credit Card Industry

Follow these tips to find the best card deal to conveniently cover your monthly business expenses.

58 Emissions Update: No More Tiers

Diesel manufacturers are delivering off-road equipment that meets Tier 4 Final standards. Two suppliers explain what's changed — and what hasn't.

- Peter Kenter

64 Associations List

70 NAWT News

More training and networking opportunities coming soon.

- Dhru Bhatt

74 Classy Truck

Mercer's Septic & Excavating, White Pigeon, Michigan

78 Product Focus: **Onsite Septic Systems and Maintenance**

- Craig Mandli

88 Case Studies:

Onsite Septic Systems and Maintenance

- Craig Mandli

89 Industry News

92 Product News

Product Spotlight: Vac-Tron PTO-driven hydrovac truck offers midsize cleaning option

- Luke LeNoble

Coming in APRIL 2016

SPECIAL ISSUE:

PORTABLE SANITATION AND SPECIAL EVENTS

- CONTRACTOR PROFILE: Starting over in Pennsylvania
- ANSWER MAN: Make sure tanks are safe and sound



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Office hours 7:30 a.m.-5:00 p.m. Central Time, Monday - Friday

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Amazing Machinery, Inc21
Amesbury Truth4
AMT
AMT Pump Company66
Amthor International35
A B
Aqua Ben Corporation47
Arcan Enterprises, Inc68
Arctic Blasters, Inc68
Azmal
Armal, Inc91 ARMSTRONG
Armstrong Equipment62
Amotiong Equipment02
В
Best Enterprises Best Enterprises, Inc29
Best Enterprises, Inc29 Bionetix International72
Best Enterprises Best Enterprises, Inc29
Best Enterprises Best Enterprises, Inc29 Bionetix International72
Best Enterprises, Inc29 Bionetix International72 Seal-R Brenlin Company, Inc87
Best Enterprises, Inc29 Bionetix International72 Seal-R Brenlin Company, Inc87
Best Enterprises Best Enterprises, Inc29 Bionetix International72 Seal-R Brenlin Company, Inc87
Best Enterprises Best Enterprises, Inc29 Bionetix International72 Seal-R Brenlin Company, Inc87
Best Enterprises Best Enterprises, Inc

E	L
	Lane's Vacuum Tank, Inc87
Ecological Laboratories, Inc. 48	LefyTank
ERICKSON	Lely Tank & Waste Solutions 19
Erickson Tank & Pump90	Lenzyme Lenzyme/Trap-Cleer4
EXPLORER	LMTinc.
Explorer Trailers - McKee Technologies47	LMT, Inc66
F	м
Solutions	## Careh
F. S. Solutions53, 72	Marsh Industrial44
Fergus Power Pump, Inc35	MASPORT
Congress of the control of the contr	Masport, Inc3
Five Peaks77	
OFLOWMARK VACUUM TRUCKS	Mid-State Tank/
FlowMark Vacuum Trucks71 Franklin Electric27	Arthur Custom Tank91
FRUITLAND, Manufacturing	
Fruitland Manufacturing73	Milwaukee Rubber Products56
G	moro
CapVax.	Moro USA, Inc7
GapVax, Inc83 Gardner Denver Ind. Group13	
	N NationalTruckCenter
Hedstrom	National Truck Center15
Hedstrom Plastics68	NVE
Miscomon M.	National Vacuum Equipment57
House of Imports11	NAWT, Inc70
IMPERIAL INDUSTRIES	Norweco, Inc41
Imperial Industries, Inc75	_
In the Round Dewatering	Oakmont Capital Services4
In the Round Dewatering84	,
International Machinery 62	P
J Jet, Inc28	Pik Rite, Inc39
K	Polar Service Centers74
KeeVac	PolyJohn' PolyJohn Enterprises107
KeeVac Industries, Inc33	A
Keith Huber Corporation48	PolyPortables, LLC81
kentucky	POWER BOOSTER BY PRESSURE LIFT
Kentucky Tank, Inc31	Pressure Lift Corporation66
Key Commercial Corp90 Klear it Kone28	Presvac Systems, Ltd108

L LANE'S VACUUM TANK, INC. Lane's Vacuum Tank, Inc87 Lely Tank & Waste Solutions19 Lenzyme Lenzyme/Trap-Cleer
M
Marsh Industrial
Mid-State Tank/ Arthur Custom Tank91 MIP Milwaukee Rubber Products56
Moro USA, Inc7
National Truck Center
0 Oakmont Capital Services4
Pik Rite, Inc
Power Boostek BY PRESSURE LIFT Pressure Lift Corporation66

R
Ritam Technologies LLC36
Robinson Vacuum Tanks43 ROBUSCHI USA65 Roeda Signs & Screen-
Tech Imaging48 Romotech36
RootX9
Rush Refuse Systems 85
SAFE TIERESH
Safe-T-Fresh45 Sansom Industries23, 24, 25
Satellite Industries2, 61 SchellVac Equipment, Inc59
Screence Systems, LLC52
Septic Services, Inc
Surco Portable Sanitation Products69
Sweet Septic Systems55
T
T&T Tools, Inc52
T.S.F. Company, Inc67
Tank World Corp12
TankTec TankTec TankTec
TankTec
Transport Truck Sales, Inc93
SYSTEMS INC.

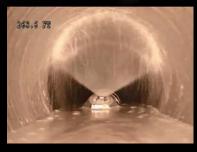
Transway Systems, Inc......5

Truck Country - Freightliner 68
TSI Tank Services, Inc36
U
Ultra Shore76
UltraLav by UTC Cargo Group17
V
VAC·CON Vac-Con, Inc
Vacutrux Limited55
VSE .
Vacuum Sales, Inc76 Vantage Trailers76
VAD
CO
VARCo51
W
WALEX
Walex Products, Inc37
@ Wallenstein
Wallenstein Vacuum Pumps/
Elmira Machine31
V _A C
Was Francis Inc. 50
Wee Engineer, Inc56
Condo
Westmoor Ltd./Conde49
Classifieds96
Marketplace94
Pumper 11

68	REGIONAL Advertisers
00	Midwest Supplement
76	(after page 74) f dvance Advance Pump & Equip3
63	Marengo Fabricated Steel1 Mid-State Truck Service4 R.A. Ross & Associates NE2 RIDER—
55	Rider Agri Sales & Service4
76 76	V&H Inc2
	Eastern Supplement
51	(after page 74)
51	(after page 74) **Todance** Advance Pump & Equip3
51	(after page 74)
	(after page 74) Advance Advance Pump & Equip3 Andert, Inc
37	(after page 74) Advance Advance Pump & Equip3 Andert, Inc
37 os/ 31	Advance Pump & Equip3 Andert, Inc







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

Do-It-Yourself Inspections: Penny-Wise and Pound-Foolish

In Washington state, homeowners can watch a 24-minute video and become certified to inspect their own septic system. But is that a smart thing to do? By Jim Kneiszel, Editor

he spokeswoman on Washington state's Septics 201 video has a perky, upbeat delivery as she trains homeowners to become qualified onsite system inspectors in 24 minutes.

"If you're watching this video, you probably can't wait to inspect that septic system. I know it sounds like a smelly job, but if your septic system is functioning properly, it's really not that bad," she explains.

"If you're a do-it-yourselfer like me, or just don't want to hire a professional, you may be able to do your own inspection," she continues. In the event that your local county health department requires an inspection certification test, she says, "It's not too hard. In fact, I'll give you all the answers."

The trainer shows the necessary tools, how to build scum and sludge sticks out of PVC pipe, and then reviews every step involved in the inspection of gravity flow, mound and sand filter septic systems. She even tells homeowners how to go online and complete inspection reports required every year or three years, depending on the location.

On the face of it, the video seems like a good tool to empower homeowners in the care of their decentralized wastewater systems. This issue of *Pumper* is dedicated to onsite septic systems and maintenance, and we can all agree that increased homeowner awareness of septic system care is a worthy goal.

The video does a nice job of mixing graphics and live demonstrations to illustrate how the most commonly used systems in Washington state treat wastewater and distribute effluent. Further, the video gives great tips to help homeowners determine the location of their system components and protect drainfields from damage. The spokeswoman also shares helpful tips about how to best utilize the system and what items to avoid flushing down the drain.

In many ways, the video provides a great service to homeowners and pumpers alike and should lead to systems lasting longer and performing better. But there is another side to this story.

RISKY BUSINESS

Time and time again, viewers are cautioned about the potential dangers of do-it-yourself inspections. The script refers to the "four F's of septic system inspections" — friend, fumes, falling and infection. The trainer explains that breathing fumes from the septic tank can be deadly and that lids opened during the inspection can lead to injuries or death if the inspector falls in or allows children or pets in the area. There are many warnings to avoid contact with septage to prevent the spread of dangerous infections.

Also, the trainer frequently advises the do-it-yourselfer when it's appropriate to stop the job and call in a professional pumper. If the scum layer is more than 6 inches, call a professional. If the sludge layer is more than 12 inches, call a professional. If you're uncomfortable cleaning the effluent

Embarking on this complicated inspection process is pure folly. While a few people will thoroughly follow all of the steps outlined in the video, the vast majority may not understand the steps or recognize sometimes telltale signs of a failing system.

filter, call a professional. If the interior of the control panel is in bad shape, call a professional. If the D-box is uneven, call a professional. It goes on and on; you get the picture.

After viewing the video, my reaction is this: Most homeowners should skip this "do-it-yourself" project and follow the advice to call a professional. And we as an industry should stress the great value, assured safety and solid results homeowners will receive by calling on a septic service professional from the start.

For most homeowners, embarking on this complicated inspection process is pure folly. While a few people will thoroughly follow all of the steps outlined in the video, the vast majority may not understand the steps or recognize sometimes telltale signs of a failing system. And a three-year inspection will almost always result in the need to call a septic service professional to pump the tank anyway.

Washington state's homeowner inspection program is the epitome of the old phrase "penny-wise and pound-foolish." The aim of the program must be to save homeowners a few dollars; the goal certainly can't be to get more complete and accurate inspection reports that professional technicians would provide. So what kind of investment would a do-it-yourself inspection require?

YOU GIVE VALUE

First, a layman inspector has to spend time – although very little time – watching the training video. Then they must buy necessary tools and safety equipment and build the aforementioned scum and sludge sticks. Also, as the video recommends, they should obtain as-built drawings of their system from the county health department. At that point, they can start digging up lids, checking inspection ports and cleaning the effluent filter.

So they might spend \$100 for supplies and several hours to complete the inspection, and still likely need to call a pumper to empty the tank or make other repairs. Figure in time, money and dangers of the job and it would be pru-

(continued)

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dent in many ways for the homeowner to call you to complete the inspection.

I'd wager the inspection portion of your pumping bill would often add up to less than what the homeowner spent to get started down the do-it-yourself road. You work faster, are insured against workplace mishaps and have years of experience to uncover subtle problems in onsite systems. Just one missed severed pipe, cracked tank or intermittent pump problem in a homeowner inspection could result in a failure and a costly system replacement down the road. Why would a homeowner take a chance like that?

I'd encourage your customers to watch the Washington state video, which can be seen here: http://www.doh.wa.gov/CommunityandEnvironment/WastewaterManagement/SepticSystem/DoItYourselfInspection-Video. While it promotes do-it-yourself onsite inspections, it also – perhaps inadvertently – makes a good case for hiring your company to perform this important task. You can start a discussion with customers about the risks and pitfalls homeowners face when performing their own inspections and the great value you offer with your complete service.

JOB DONE RIGHT

The threat to the environment is my biggest concern when homeowners are certified to perform their own septic system inspections. Will they miss a sign of a failing system? Will self-inspectors cut corners to get the job done faster? Will some homeowners ignore problems and close the lid, hoping they can put off costly repair or replacement of failing systems? These scenarios are all possible when people with little training, no experience and a vested interest in the outcome are allowed to declare their systems fit and in compliance.

On the other hand, you are a trained, experienced and impartial professional and nobody will question the results of your inspection report. Homeowners should realize it's a smart and fiscally responsible move to call a septic service professional to inspect and pump their systems.





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days are all under the microscope thanks not only to what we see as common practice in other countries, but also because some U.S. corporate giants are introducing sweeping changes. 33

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umping was a sideline project for William Clark, something his Abbey's Septic Service provided just for the Canadian hamlet of Bethany, Ontario. He focused on raising beef cattle and cash crops on 200 acres instead of promoting the business, founded in 1983.

Son Mike, however, saw a demand for installing and repairing onsite systems. Graduating from high school in 1988, he persuaded his grandfather to co-sign a loan for a backhoe and opened Mike Clark Excavating & Septic Pumping. That year, he replaced 25 stone-and-pipe trench systems, jobs gleaned from pumping the owners' septic tanks.

Living in a remote area isolated Clark from industry advancements. "Lacking even dial-up Internet service, we were stuck in an age just a little ahead of the Pony Express," he says. "It retarded business growth because I didn't realize what we were missing."

Clark compensated by building the necessary trucks and equipment. He overcame two economic depressions, equipment failures, fire and theft. "I knew I had succeeded when Dad said he was impressed that I was making more money pumping than he had."

(continued)

Profile Mike Clark Excavating & Septic Pumping Bethany, Ontario, Canada **Ontario OWNERS:** Mike and Elaine Clark **FOUNDED: 1988 EMPLOYEES:** 6 **SERVICE AREA:** Durham and Peterborough counties, Brock Township and City of Kawartha Lakes **SPECIALTIES:** Onsite system installation and repair, septic pumping, portable sanitation **AFFILIATIONS:** Ontario Association of Sewage Industry Services, Ontario Onsite Wastewater Association WEBSITE: www.mikeclarksepticandexcavating.ca



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Right: Standing in front of the company office are, from left, Diane, William, Mike and Elaine Clark

Below: Satellite Industries restrooms, in the company's blue and orange colors, wait for delivery in the company yard.



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MEETING CHALLENGES

The revenue from those first installs enabled Clark to pay cash for a tandem dump truck. The following spring, he bought a Komatsu D31 trim dozer. By 1992, Clark had four bulldozers, an excavator, a backhoe, two tandem dump trucks and two employees. He still pumped using his dad's converted single-axle farm truck with a liquid New Idea tank.

A 1994 economic collapse destroyed numerous small companies, including Clark's. To feed his family, he spent four years working in the Alberta oilfields excavating pipeline trenches. During that time, competitors took over his father's territory.

"Dad didn't care, but I did," says Clark. "After returning home, I immediately bought a new backhoe and excavator. When Dad sold his company and two homemade septic trucks to me in March 1999, I came out of the cannon on fire. Within two years, we were pumping in one month what he did in a year." (Today, they pump 2.5 million gallons annually, land-applying in summer and off-loading at a treatment plant in winter.)

Clark's success had bumpy beginnings. During his first week in business, the engine blew in a septic truck. Clark bought a tandem Freightliner. A friendly competitor sold him a 2,200-gallon steel tank. "Dad said the truck would break me because it had a large engine," says Clark. "All I saw was the ability to go down the road faster and service more people." He ran it for two years.

Around this time, Clark lost interest in commercial excavation work and streamlined the company for onsite repairs and installations. His motivation was seeing new stone in "failed" beds they were hired to remove. As he pumped tanks the day before the systems were to be replaced, Clark be-

gan looking at the grass and walking around drainfields. If he saw nothing wrong, he asked the homeowners if he could investigate further.

Clark believed 90 percent of failures were due to the gravel/sand soil and insufficient hydraulic flow. "It's common to find 500 feet of PVC pipe in drainfields servicing households with only two people," he says. "The soil's high percolation rate enables effluent to soak away 2 feet from the header. It's a perfect scenario for a septic's No. 1 enemy – ants."

The insects colonize the unused laterals, eventually blocking most pipes and causing backups when effluent has no place to go. Many times

When Dad sold his company and two homemade septic trucks to me in March 1999, I came out of the cannon on fire. Within two years, we were pumping in one month what he did in a year.

- Mike Clark

Clark sees evidence of their activities in the grass. Most of the time, laborer Garry Atherton opens the laterals by jetting them.

EQUIPMENT UPGRADES

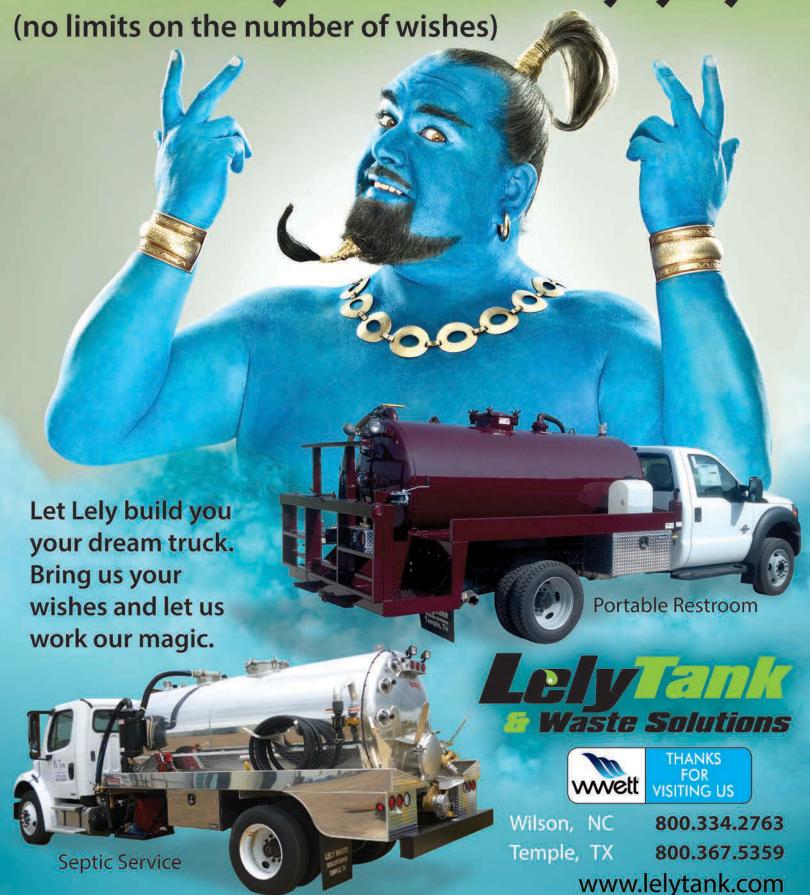
Not knowing jetters were commercially available in 2003, Clark simply built one using a 3,000 psi/3 gpm pump. A machine shop fabricated a single jet nozzle to ram a pilot hole through the blockage, and a rotary spray nozzle to shove the mass out the end into a bell hole for vacuuming into the septic truck. Clark used stiff hydraulic hoses to help push the nozzles forward.

Pushing instead of pulling debris backward occasionally created impenetrable blockages. "We'd send the cable machine with a corkscrew auger up from the end of the pipe to create a channel, then tie the auger to the nozzle and pull it out," says Clark. "Using the jetter took time and caused backaches."

Relief came in 2004 when Clark hired Bill Wheeler, who had worked for a major septic company. As they calculated the hours required to jet a

(continued)

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Left: Mike Clark works in a new trench while Billy Clark helps in the background.

Below: Mike Clark cuts PVC pipe during a septic system replacement in Bethany, Ontario, Canada.

large government drainfield, Wheeler suggested subcontracting the job to Gary Ramsey. His commercial jetter completed the project in less than 60 minutes.

After learning Ramsey was using equipment from Presvac Systems, Clark bought nozzles and 250 feet of high-pressure hose, then a 4,000 psi/5 gpm Comet pump and 13 hp Honda engine. "I couldn't believe what we had in our hands," he says. "It propelled the company out of the Stone Age and into the Space Age."

Another business boost came when the septic code mandated effluent filters. "Maintaining the screens enabled us to educate people about their systems and to inspect them," says Clark. Then county health department permits prohibited water softeners from discharging to septic tanks. If Clark's team found such a scenario while repairing a failed system, they

Why you should consider sponsoring sports teams

Sponsoring local baseball and soccer teams is one way Mike Clark promotes his business, while helping keep Bethany (Ontario) Community Park open for youngsters. Since 1999, he has given players their own jerseys. "Long after the season is over, the kids still run around town with Mike Clark Excavating on their backs," he says.

Clark and his wife, Elaine, also host the playoff barbecues, and their 17-year effort is paying dividends. Some original players have hired him for point-of-sale inspections or onsite installations. "By the second installation, I had recovered my total expense for the years of uniform sponsorships," says Clark. "The true satisfaction, however, comes from their gratitude for giving them somewhere to play sports when they were young."

The Clarks also support the park's annual fundraiser, competing with other businesses to bid on baked goods. "It's a full-blown auction complete with an auctioneer," he says. "We're always one of the companies bidding for the last cake, and it's a real dogfight. People talk about it for weeks, and that we were willing to pay \$2,000 or more for a cheesecake."

Those who stop to thank the Clarks for supporting the park are invited to enjoy a \$200 slice of cake, something they won't find in even the finest Toronto restaurants.



rerouted regeneration water to surface discharge or installed stone receiving pits. Clark also observed systems failing from shock loads.

In 2005, he expanded into portable sanitation, purchasing 30 units from PolyJohn Canada for customers hosting big parties. When construction sites asked for portable restrooms, Clark bought 20 more from PolyJohn. Then he purchased 90 Armal units to rent to provincial parks, and pumped their rest areas. As demand increased, Clark ordered 60 blue and orange units from Satellite Industries, the new colors of the company's portable sanitation branch.

FACING A CRISIS

By the mid-2000s, Clark believed his company's future was secure. Then the economy crashed in 2008 and a customer reneged on a \$250,000 job. "We went from safe to survival mode in one morning," he says. Clark let his

(continued)



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manager and two of seven employees go, and took on excavation projects and snow removal to fill the service board.

That winter, his customized articulated load-

Mike Clark digs a trench using a Kubota KX121-3 excavator and Billy Clark monitors the progress.

er was stolen. The crew scraped through using farm tractors with buckets. The next summer and two hours into a major excavation, the John Deere 750 bulldozer exploded and burned to the ground. Water from extinguishing the blaze and fuel from the ruptured 80-gallon tank ran 400 feet down the road, creating an environmental disaster.

"In trying to tighten the company's belt, I had failed to properly insure the dozer," says Clark. "The insurance company refused to cover either claim, but after a lengthy dispute I was paid \$20,000 for the machine and they covered cleanup costs." Meanwhile, Clark completed the excavation, which eased the cash flow situation. Five years later, the customer in default met his financial obligation.

With the crisis behind him, Clark worried his recordkeeping had fallen by the wayside on several pieces of equipment. He was running a 357 Peterbilt with 3,800-gallon Vacutrux tank and Wallenstein pump, 359 Peterbilt with 3,500-gallon Cusco tank, Freightliner with 3,000-gallon Presvac tank, 359 Peterbilt tandem dump truck with Manley box, 359 Peterbilt tri-axle dump truck with Bibeau box, Ford F-350 portable sanitation truck with Vacutrux tank, and various pickup trucks and trailers. He hired Sue Atherton, a retired Ministry of Transportation officer and Class A mechanic, as his

full-time fleet maintenance manager. "She documented every truck's movements right down to washing the windscreens and calculated exactly how much each one cost," says Clark.

Clark currently runs a variety of excavation equipment. The list includes a Kubota KX121-3 excavator, a Hitachi 160 excavator, a Kobelco 60 excavator, a John Deere 15 excavator, a New Holland 565 skid-steer, a John Deere 570 grader and a John Deere 550 trim dozer.

We're headed toward an infrastructure crisis. Too many installers have retired and were not replaced.
Bethany has only two installers besides me.
Who will replace these systems in the future?

- Mike Clark

CHANGING DYNAMICS

During the last five years, pumping and onsite work each contributed 40 percent to the company's revenue, and portable sanitation the remainder. "Our residential and commercial/industrial work is all septic repair or installations," says Clark. "We install 10 to 15 systems annually, split 50/50 between stone-and-pipe and sand filters. Years ago, we installed 50 systems a year."

In 2015, Clark switched to installing Ecoflo peat moss biofilters (Premier Tech Aqua) in response to a growing population of retirees. "Most

people relocating to our hamlets come from cities, and they demolish the onsite systems through overuse, lack of maintenance or flushing pharmaceuticals," he says. The biofilters enable Clark to replace contaminated media and preserve the system.

Clark sees systems installed in the late 1950s to early 1960s failing in record numbers. Many were built with one or two clay tile laterals, which have collapsed.

"We're headed toward an infrastructure crisis," says Clark. "Too many installers have retired and were not replaced. Bethany has only two installers besides me. Who will replace these systems in the future?"

Clark, 48, plans to retire in five to seven years, but he is grooming son Billy, 22, to take over the company. "He's been at my side for most of his life, so the transition should be seamless," says Clark. "I'm very proud of him."

MORE INFO

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Cusco 800/490-3541 www.wastequip-cusco.com

PolyJohn Canada 800/465-9590 www.polyjohncanada.ca

Premier Tech Aqua 800/632-6356 www.ecoflobiofilter.com Presvac Systems 800/387-7763 www.presvac.com (See ad page 108)

Satellite Industries 800/328-3332 www.satelliteindustries.com (See ads. pages 2. 61)

Vacutrux Limited 800/305-4305 www.vacutrux.com (See ad page 55)

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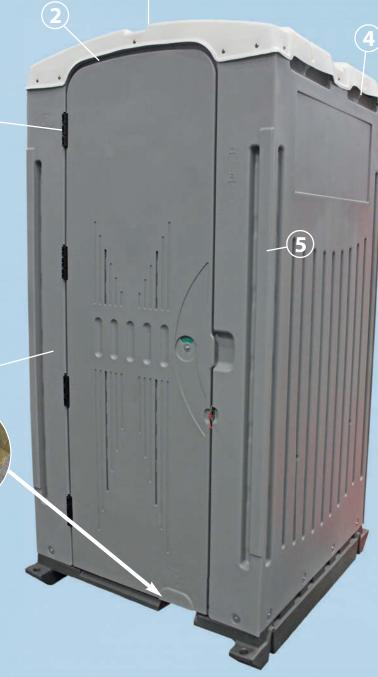
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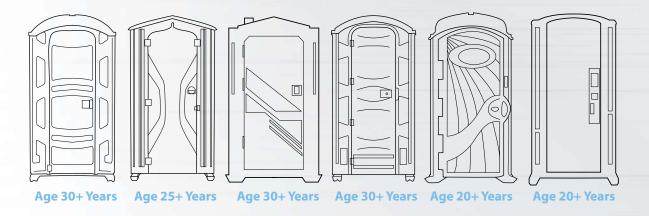
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Jeff Haden is a contributing editor for Inc.com and a LinkedIn Influencer.

5 Tips to Make Your Social Selling Take Off

Online networking can help you get to know potential customers for pumping and portable sanitation services By Jeff Haden

ales are like great employees: Every business could use more of them.
Unfortunately, though, I'm a pretty poor salesman.

That's why when I write about sales strategies and techniques.

That's why when I write about sales strategies and techniques, I turn to experts for input — like Mike Derezin, vice president of sales solutions at LinkedIn, the online social network for business professionals. Recently we talked about social selling, the process of building stronger relationships with potential customers based on truly understanding their needs and problems – in short, getting to better know the people you hope to do business with.

Every person involved in sales dreams about living in a world without cold calls and enjoying a network built solely on referrals. Those dreams are actually closer to reality than you might think. And that's a good thing, because cold selling lacks personalization and relevance – the fundamental tactics that establish good business relationships and lead to more sales.

In today's e-business environment, cold calls are a last resort. Instead, salespeople use social networking to ask for personal introductions and connect with prospects and customers. This is what's known as social selling.

By building your own personal brand and leveraging existing networks, anyone – regardless of industry or the size of your business – can master the art of social selling to drive referrals. Here are five ideas to get you started.

Connect with people you know. While this may seem obvious, a strong network built on real-world connections allows people to vouch for you. It will also strengthen your referral bank by opening up the possibility of forming relationships with people your connections know.

LinkedIn's research shows that buyers are five times more likely to engage if the contact is made through a mutual connection, so be sure your

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offline contacts are reflected in your online world.

Leverage your company's network. Have you ever made a cold call only to find out later that a co-worker knows your prospect? Social networking minimizes the chances of this happening. It also makes it easier to get information about the people you want to engage and a path to connect with them. According to LinkedIn research, 88 percent of buyers will engage in discussion if introduced through someone in their existing network.

And remember, no one likes a canned approach. Be thoughtful enough to customize your message. It will go a long way in making a good first impression.

Find connections based on shared interests. Online alumni networks and industry-specific networking groups are just two examples of places to connect through shared interests. Think of these as your "digital water cooler," a place to engage in conversation with information that may have otherwise gone unnoticed.

Engaging with prospects through common interests will give you more visibility, making it more acceptable to ask for a referral.

Build your professional brand. Consider your online presence as a key marketing tool. Half of buyers say they won't work with salespeople who have incomplete social profiles online, so make sure you put your best foot forward by tailoring the content to reflect your expertise. (And don't forget to do the same on the "Meet Our Staff" page of your business' website.) Experiment with videos and images by embedding them in your profile. The saying "a picture is worth a thousand words" has never been more true than on social media.

Be vocal. Beyond your profile, liking and sharing content can increase the likelihood that your network will engage with the information and pave the way for new referrals. Consider sharing articles or blogging regularly on relevant industry topics. Give your point of view and invite responses by taking risks in your answers.

On sites other than your company's website, it's OK to share information about your products and services, but only occasionally and as appropriate. This will distinguish you among a sea of salespeople and position you as a smart resource.

And lastly, stay on top of what's important to your key contacts by paying attention to the content they share, and chime in when you have meaningful insights.

Social selling offers massive opportunities to make new contacts, establish an online reputation and build a sales pipeline. Together, these activities lead to an increased network of referrals, which is easier to achieve than ever before.



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Making Connections is a Key to Successful Lobbying

Virginia wastewater professionals build strong relationships with regulators By Doug Day

he Virginia Onsite Wastewater Recycling Association (VOWRA) has built an improving relationship with state regulators over the years, but the group representing onsite wastewater professionals is striving to do more with important issues, including the shortcomings of real estate transfer inspections, says its president, John Powell.

VOWRA was formed in the 1980s and today boasts a roster of about 300 members, most of them installers, pumpers, soil evaluators, engineers and regulators. The group has done a lot to raise industry standards — and the quality of onsite wastewater treatment in general, Powell says. He brings us up to date on the group's activities.

What is VOWRA's primary purpose?

Powell: VOWRA is an affiliate of and set up much like NOWRA (National Onsite Wastewater Recycling Association). Our mission is to support, strengthen, advance and unify the industry through education, training and representation for our members, and to collaborate with everybody in the onsite industry. I think we do well with that. We attempt to offer conveniently located trainings around the state so our members don't have to travel so far to maintain their license.



Reach John Powell through the Virginia Onsite Wastewater Recycling Association at www.vowra.org or 540/377-9830.

The federal Chesapeake Bay Watershed Program has some states trying to ban or limit septic systems. What is the attitude of state regulators toward.

systems. What is the attitude of state regulators toward onsite wastewater?

Powell: That there are alternatives to big pipe, and onsite wastewater

is critical to protecting the environment. We're in the Chesapeake Bay program, so we have to reduce nitrogen. In 80 percent of Virginia, any new alternative system has to be a nitrogen-reduction system.

Our relationship with the Virginia Department of Health (VDH) is excellent, it's very collaborative. Two of our board members are VDH employees. We're heavily engaged with them on public policy and provide a forum for regulators to express their views and opinions to the industry.

We have a good set of regulations covering soils, design, installation, and operation and maintenance. An owner of an alternative disposal system is required to have an annual inspection along with maintenance requirements, which all need to be performed by a licensed operator and reported to the state's database.

Over the last few years, what do you see as VOWRA's biggest accomplishment?

Powell: Virginia started phasing in licensing for onsite professionals about seven years ago, so we're finally on a smoother road with that. We sup-

ported that and are where we need to be, I feel.

There were a few who didn't support it and still don't. I think it put a lot of fear into the older-generation contractors who were afraid of taking the test. The Virginia Department of Professional and Occupational Regulation (DPOR) reworked the exam a couple of times to make sure it was clear and appropriate, and held several workshops last year to help those needing a license. We took that opportunity to provide a low-cost wastewater math course to provide further help.

DPOR allowed an interim license and you had four years to take the exam, along with a certain amount of continuing education. A few dragged their feet, so the Legislature granted a six-month extension for taking the test as long as you had maintained your continuing education requirements. For

the most part, I think most involved are getting it.

We've also worked with VDH to get them to be more of a regulator than a competitor. They used to do soil work and system design much, much cheaper than the private sector could and most felt it wasn't fair. VDH has adjusted its fee structure, does a much smaller percentage of designs and only does the most basic conventional designs. If it is a tough site or alternative system, it always goes to the private sector.

VDH has always expressed desire to get out of evaluation and design and is under considerable pressure to do so. Budgetary reduction in VDH could likely result in continued privatization. In the rural parts of the state, privatization could be dif-

estate companies
use home inspection or pest
control companies that will
do a \$50 to \$100 walkover
with no assurance for the
purchaser. They'll go in and
just flush some dye down
the toilet and walk the yard.
Almost never will you see
the dye. They look in the
front yard when the system
could be in the back
and vice versa.

- John Powell

ficult, plus some localities don't want it.

This issue is tough, as VDH is responsible to ensure public health protection.

What do you see as issues to tackle in the future?

Powell: We have to have regulations to dictate proper practices for real estate transfer inspections. They are not required by law, but the lenders normally require one.



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Most real estate companies use home inspection or pest control companies that will do a \$50 to \$100 walkover with no assurance for the purchaser. They'll go in and just flush some dye down the toilet and walk the yard. Almost never will you see the dye. They look in the front yard when the system could be in the back and vice versa. For the most part they don't pull any information from the Health Department.

They just do what is minimal to close the deal. Then the purchaser is stuck with thousands of dollars of needed repairs. I see it almost daily. That needs to be stopped and we are working on it. This issue is one not limited to public health but also consumer protection and sustainable infrastructure. It's going to be a challenge. VOWRA is just starting to discuss the issue, and we have a ways to go yet.

How are you raising awareness about the importance of effective onsite treatment?

Powell: VOWRA does not have a lobbyist or an adopted formal plan of action. For the most part, we try to be informed as much as possible and make sure things move in the right direction, or at least not the wrong one. It is very difficult as some folks expect us to straighten things out for them.

We are affiliated with NOWRA, and they're going after funding for the industry. The Chesapeake Bay agreement has provided more funding for the big pipes and agriculture, but not for onsite wastewater systems in Virginia.

Tom Fritts, past president of NOWRA, testified before an appropriations committee last year asking Congress to direct funding more fairly and to the (U.S. Environmental Protection Agency) decentralized wastewater office. He testified that more than 99 percent of the EPA Clean Water State Revolving Fund goes to municipal wastewater, and less than 1 percent goes to onsite. We'd like to see at least 20 percent dedicated to increasing staffing and resources. The EPA has only one full-time employee focused on decentralized wastewater.

Virginia has a program to help fund septic repairs for certain situations. The only problem is, we don't have a source of funding. Once the EPA, or whoever, starts handing money to the states, we hope to put some money into that fund.

You had a Mega Conference last November. How did that go?

Powell: NOWRA has been going around to different states, teaming up to do joint conferences. VOWRA and NOWRA presented the conference with the National Association of Wastewater Technicians (NAWT) and the State Onsite Regulators Alliance (SORA). We have a good conference every year. Having it with NOWRA and the other groups was an honor. All can attend and go away with something, whether it is good advice from others in the field or from manufacturers about new products. ■







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*As of February 29

More sophisticated wastewater systems will improve health of Alaska citizens

By Doug Day

ith presentations from three remaining teams, the Alaska Water and Sewer Challenge has moved into its third phase of a multi-year project aimed at eliminating "honey buckets" (hand-carried pails) in the state's rural communities. According to the project's website (watersewerchallenge.alaska.gov), the Alaska Department of Environmental Conservation began the project in 2013 to "spur worldwide research to develop innovative and cost-effective water and sewer systems for homes in remote Alaska villages. The project focuses on decentralized water and wastewater treatment, recycling and water minimization."

More than 3,300 rural homes have no running water or flush toilets, with many using buckets to collect human waste and carry it to community sewage lagoons. A 2010 study found higher rates of invasive pneumococcal disease (IPD) among Alaskan children who did not have access to piped water. IPD is a serious bacterial infection that can affect the brain, blood and lungs, and residents of southwest Alaska suffer rates among the highest in the world.

Funding for prototype development and pilot lab testing will be awarded to three of the six teams that presented detailed proposals. Results of the testing will be presented in fall 2017. Those that meet the performance targets will be provided further funding, followed by field testing and technology improvement.

The final three teams are:

DOWL Alaska (engineering firm) — Water and wastewater holding tanks located in a small vestibule attached to the house to minimize space requirements in the home and avoid the use of expensive heat trace to a separate holding tank outside the home. The pilot system will be set up in Fairbanks at the Cold Climate Housing Research Center.

Summit Consulting (engineering firm) — Treatment of raw water by means of a two-stage cartridge filtration process followed by ultraviolet disinfection, which allows flexibility to treat a wide range of raw water quality. The pilot system will be set up at the company's main office complex in Tok.

University of Alaska Anchorage (UAA) — Recycle both graywater and some black water, as well as the use of a modular approach that will allow homeowners to select in-home components that fit their lifestyles and space available. UAA's pilot system will be set up on the school's Anchorage campus.

Canada

The failure of a referendum in a British Columbia community has officials wondering what will happen next with septage. It started in 2014 when the City of Fort St. John announced it was closing its septage receiving facility because several illegal dumping cases threatened the city's treatment system. Septage has become a problem in recent years due to an increase in

waste from oil drilling worker camps. Many of the trucks carrying septage are also used to haul chemicals for oil operations that can harm sewage treatment plants.

In response, the 46,000-square-mile Peace River Regional District (PRRD), located northwest of Calgary, began planning for new septage receiving stations to serve its rural residents and worker camps. The City of Dawson Creek also built a \$3.5 million trucked waste facility at its municipal wastewater treatment plant.

Last fall, a referendum to fund operations at a newly opened (PRRD) receiving station in Charlie Lake failed. It would have levied a tax of 11.4 cents per \$1,000 of assessed improvements to properties. Operations will have to be funded through user fees, expected to be high because of the small pool of users. That may cause many people to take their septage to Dawson Creek, posing capacity problems and increasing operating costs.

Idaho

Several updates to onsite wastewater rules are being considered in Idaho. The Department of Environmental Quality says revisions will cover easements for when septage is stored, treated or disposed of on property other than where it originated, and minimum recommendations for intermittent filter dosing and constructed wetlands used for secondary wastewater treatment.

Minnesota

The Minnesota Pollution Control Agency is offering \$270,000 in grants to improve or replace old diesel engines to reduce their impact on the environment. Since 2006, the MPCA Clean Diesel program has reduced emissions equivalent to taking 750,000 cars off the road.

The grant requires the vehicle owner to cover 60 percent of the cost of upgrading or replacing a diesel engine, or 75 percent of the cost of replacing a truck or piece of construction equipment. Vehicles to be upgraded must be fully operational, and if the engine is replaced, the old engine must be permanently disabled. The agency says it has completed projects on more than 1,800 school buses along with garbage trucks, tanker trucks, construction cranes and delivery trucks.

Missouri

Ozarks Water Watch has received a second \$1 million grant from the Missouri Department of Natural Resources to replace and repair failing septic systems in the White River watershed that feeds the Lake of the Ozarks. Under a previous grant, 130 systems were repaired or replaced. Homeowners can get up to \$25,000 with half being in the form of a grant and the other half a no-interest loan. With the new grant money and loans, 200 systems are



expected to be repaired or replaced in this round. New is a \$50 rebate to help with septic system pumpouts.

Oregon

While food carts in the state are licensed by local health departments, removing and hauling their wastewater requires a license from the Oregon Department of Environmental Quality, according to a reminder posted on the agency's website. That's because such a license is required to pump or haul wastewater that is defined as sewage: "water-carried human and animal wastes, including kitchen, bath and laundry wastes from residences, buildings, industrial establishments or other places." Portland has more than 500 such carts, according to Food Carts Portland.





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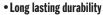
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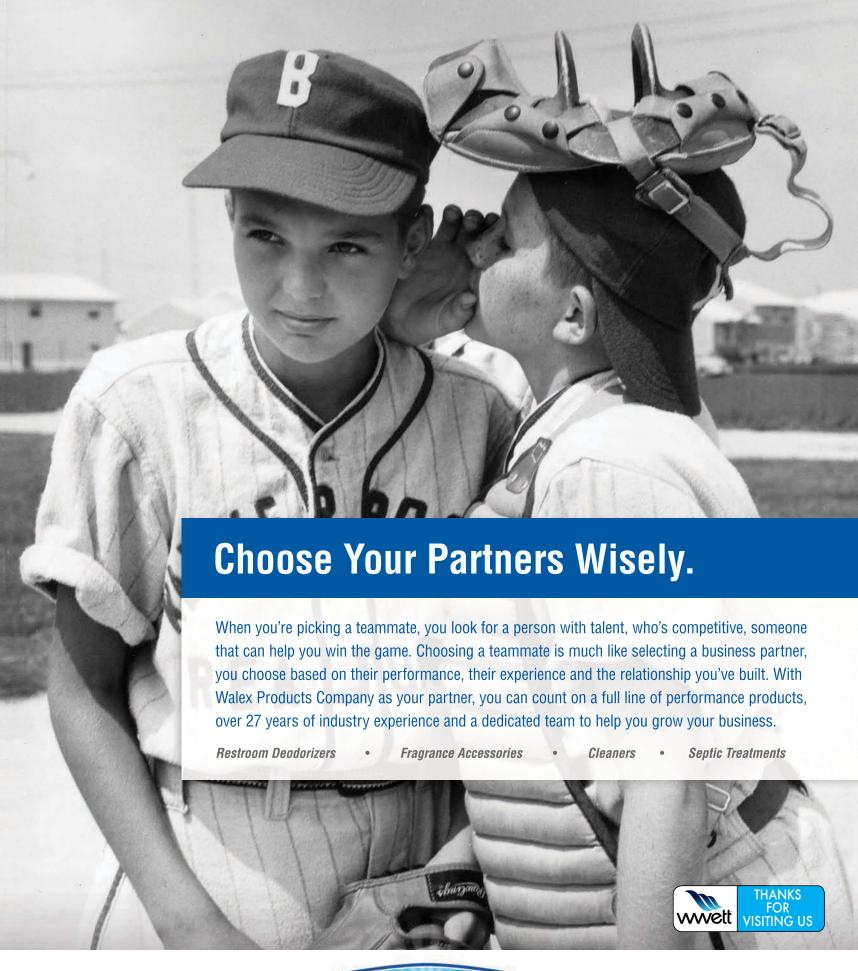
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"We go everywhere. If a customer calls and needs our help, we're going to go. We don't stop to see where he's located. We just want to help, get the job done, give customers 100 percent satisfaction and let them know we're there for them," Brooks says.

Georgia offers plenty of work because of its history and its regular cycles of construction. "We have a lot of old systems in the state. It seems like so many systems are failing," Leist says.

Most systems they install are conventional. ATUs and more advanced technologies are employed when the soils or local health officials require them. The company is certified for drip systems and ATUs, and technicians acquire every certification they can because it can make the difference be-

tween landing a job and not landing a job, Brooks says.

Installation work has been trending upward for Affordable Septic. Several years ago there were four or five systems on the schedule every two months. Now it's 10 to 30 systems. Leist estimates half of the increase is due to Atlanta sprawl and half is the result of more and better marketing.

The business breakdown is about one-third pumping, one-third system installations and one-third services includ-

> James Brooks, left, and Todd Davis work on an onsite system installation.



If we see a family in need we're going to help them.
We can't say being in business and creating money is our contribution to the community. We have to take care of people.

— James Brooks

ing plumbing, onsite repairs, installing risers and monitoring ATUs.

EDUCATION IS JOB NO. 1

Leist says many Georgia residents don't pay attention to their septic systems because they're out of sight. Some aren't even aware they have a septic system. Affordable Septic is working to change that. Its website has a large customer-education section, and technicians stress the importance of maintenance to customers. Regular customers are

put on a maintenance schedule. The State of Georgia does not have a mandatory pumping rule, but there is talk of one and local health departments urge people to have systems pumped every three years.

The state does require point-of-sale inspections, and Affordable Septic has been building that end of its business for the last two years. A good deal of service work comes from inspections and system maintenance. When alternative treatment systems came into wider use, the size of required drainfields was greatly reduced, causing problems, Leist says. As a result, systems became overloaded, and Affordable Septic is now being called in to help by adding drainfield capacity or building new systems.

"It was so fast-paced back in the day; a few years ago when construction was booming, people slung that stuff in the ground. A lot of times we see bellies in the pipe; when we dig the pipe up it looks like a banana. Those hasty installations make up a lot of the service work around here," he says.

The company also does residential and commercial plumbing, and some industrial plumbing. It has a contract to maintain every U.S. Postal

(continued)





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Service office in Georgia and all the FedEx stores. Those generate three to five calls a week. About 70 percent of these calls are for simple repairs such as a leaky toilet or a broken faucet. All the equipment is in the truck, and a single technician can handle several jobs in a long day's drive.

In the past year, construction has been picking up, Brooks says, and that opens other opportunities. He says Leist enjoys "going into a new subdivision, finding the superintendent and talking to him about doing all the plumbing and wastewater work. He'll give them a price that no one else can beat."

THE FAMILY BUSINESS

Brooks, 32, has deep connections to plumbing and wastewater through Leist as well as his biological father, Frank Brooks, who also worked in the industry. Leist and Frank Brooks were best friends, and the elder Brooks died three years ago.

Starting at about age 9, Brooks frequented the shop and started learning plumbing fittings. At 19, he was managing a branch of another plumbing company. His uncles are plumbers, too, and Brooks says he regularly calls them for advice about problems he finds on the job. "I'm never too good to

learn stuff. There's always something you can be up against and not know a lot about."

That experience and connection naturally led to the formation of Affordable Septic. Leist wanted to cut back on his own business, so he and Brooks formed Affordable in 2012.

Providing such diversified service requires extensive equipment. The list at Affordable Septic includes:

• 2003 GMC with a 2,000-gallon steel tank and Jurop/ Chandler pump, built by





Affordable Septic Service in Statham, Georgia, is constantly looking for ways to overcome obstacles to providing effective emergency service.

"At some companies, they use night as an excuse for not coming out to do an emergency job. We believe in doing everything for our customers, so we look for ways to remove darkness as an obstacle," says co-owner

Hand-digging in the black of night is one challenge. Often a job will be in a place where a truck can't go, which means no floodlights to illuminate the job site. Or the work is too far from a building for extension cords to reach power lights.

Brooks and co-owner Allan Leist, his stepfather, came up with the idea of a lighted shovel. They bought a standard headlamp and manufactured their own mount to attach it to the handle of a standard shovel. Light goes exactly where the technician needs it to be.

They modified a shovel with LED lights. The bulbs and power source are integrated into the handle. So far they only have a prototype. They're still tinkering with the design but are considering manufacturing these shovels and turning them into another source of revenue.



Above: James Brooks, left. and Todd Davis use a RIDGID K-6200 drum machine during a service call.

Left: James Brooks gets his son, Jayce, started young by showing him the controls of a Takeuchi excavator.

Diversified Fabricators in Griffin, Georgia

- 2001 Peterbilt with a 3,000-gallon steel tank and Jurop/Chandler pump, built by Diversi-
- 2003 and 2005 Ford F-350 pickups
- 2015 Dodge 4500 pickup
- 2000 Ford F-250 panel truck with four-wheel
- 2000 Dodge service van for plumbing calls
- Several Hardeebilt trailers
- 2004 or 2005 New Holland farm tractor
- Three RIDGID inspection cameras, one with a 300-foot cable and two with 100-foot cables
- RIDGID K-6200 drum machine
- A Cat electric jetter with 300 feet of hose
- Three Takeuchi excavators, TB016, TB135 and TB250

There's a jetter on the Peterbilt vacuum truck, too, but the crew at Affordable made it themselves by mounting a RIDGID pressure washer engine on the truck and using a converter kit to reduce output pressure.

MARKETING ON A BUDGET

Spreading the word about Affordable Septic is done through low-cost channels. There is word-of-mouth, and the company uses its website extensively. Pages educate customers on how to care for septic systems, discuss common symptoms and causes of a failing system, and allow for scheduling service calls. Another page includes customer testimonials drawn from a phone book website and the company's Facebook page. Many customers tell Brooks they viewed the website before calling.

Equipment provides another way to advertise. While many companies put a name on their trucks, Leist and Brooks take that idea a step further. Their Takeuchi excavators are in the company colors of red, black and white and feature the company's phone number. Sometimes equipment goes back to the shop after a day's work, but often it stays on location, acting as a temporary billboard. People can see a job in progress, see how well it's being done and see who's doing it.



Caring for the people around them is another way to keep their business in the public eye. They support the schools near their shop. They provide Christmas presents for disadvantaged children. They donate a Thanksgiving dinner to an area family. They offer discounts for senior citizens, veterans and single mothers.

"If we see a family in need we're going to help them," Brooks says. "We can't say being in business and creating money is our contribution to the community. We have to take care of people."

The quality of workmanship you get out of that person reflects what you'll do for that person. The guys who work with us go over and beyond for us because we go over and beyond for them.

- James Brooks

CARING FOR THE CREW

While caring for the community helps build a good reputation among customers, care for the company's staff ensures work is done properly. Affordable Septic offers its employees a 401(k) retirement plan and health insurance. There are bonuses, and that means a bonus over and above overtime pay.

"We always offer something else that is unexpected. My father is a very generous man," Brooks says of Leist. Recently the transmission went out on the personal car of a driver. Leist had the car towed, fixed and waiting at the shop when the driver was done with his workday.

"The quality of workmanship you get out of that person reflects what you'll do for that person. The guys who work with us go over and beyond for us because we go over and beyond for them," Brooks says.

Current workload requires more people than Affordable Septic has on hand. Brooks has plans to change that, but he wants to grow in the right way. That means no debt and a limit on how large the company will be. Keeping the company small and personal is important to Brooks. Eventually he would like six vacuum truck drivers, six plumbers and six people for other jobs.

By 2017, he would like to add three more plumbing vans with a focus on residential service. His plan for this year is to add pumping capacity, but not with another vacuum truck. His purchase will be a tanker that holds at least 5,000 gallons. He will intercept vacuum trucks on their routes and transfer septage into his big tank, then dump at a station while drivers continue with their routes. There is a time advantage to keeping drivers on their routes, but there is also cost. By taking wastewater to one particular station he will pay 7 cents per gallon instead of the 10 to 12 cents common in the area.

"The more people you hire, the more overhead you have and the more money you have to take from customers. All we want is to do a good job for a fair price," Brooks says.

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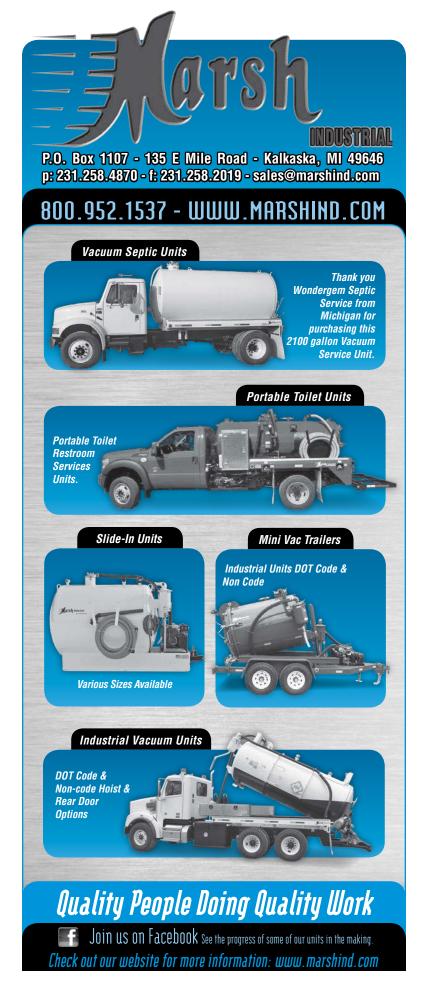


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Educate Waterfront Homeowners About Septic System Woes

Kentucky program works to identify and address a growing number of problem onsite systems before *E. coli* works its way downstream By David Steinkraus

he Dix River zigzags through central Kentucky for miles until it empties into the Kentucky River about 20 miles southwest of Lexington. But scientists found that the Dix was carrying more than just water. There was contamination, too, and that led Bluegrass Greensource, a nonprofit organization located in Lexington, to team up with local wastewater professionals to help solve the problem.

Pumper caught up with Bridget Abernathy, an outreach specialist for Bluegrass Greensource, to learn about the problem and the program.

Pumper: What does Bluegrass Greensource do?

Abernathy: We started in 2001 under a different name, but our focus has always been to serve as a resource and provide education. We work in schools and we work with adults to teach them about conservation and sustainability. For example, we work with businesses on recycling plans. They may have a program in place to recycle office paper, but when it comes to cardboard or other items, that may not happen throughout a plant because it's a big job. We help with waste audits, assessment of needs and staff training. We also work with businesses to assess their energy use and suggest ways to reduce it.



Contact Bridget Abernathy at Bluegrass Greensource in Lexington, Kentucky, at 859/266-1572 or bridget@ bggreensource.org.

Pumper: Could you describe the Dix watershed and its problems?

Abernathy: It's a medium-sized river that flows into the Kentucky River and thus into the Ohio River. There's also a lot of water recreation that happens on it. Water recreation — swimming, boating, fishing — is very big in Kentucky, generally. Scientists from the University of Kentucky Water Resources Research Institute have been studying the Dix for years. They found very high *E. coli* levels in the Dix tributaries, and by high I mean 10 to 1,000 times the (U.S. Environmental Protection Agency) limits. Of 234 miles of stream they looked at, 104 were unsafe for wading and swimming.

Because we have a lot of cattle farming around the Dix, they also looked at the genetics of the microorganisms to learn where the $\it E.~coli$ came from. Human waste was the largest contributor.

Pumper: What septic problems did they find?

Abernathy: There was a survey along Hanging Fork Creek, one tributary of the Dix. Researchers looked at 2,700 properties with septic systems

and found 37 percent were failing. It's safe to assume the problem is similar in the rest of the state. For decades we've had a problem with straight-pipes, which is a pipe that takes waste from a home directly to a stream or to a ditch that runs into a stream. This was once very common in Appalachia where they have little ability to use traditional septic systems because of the topography or geology, and it's more common in areas of high poverty.

Pumper: How did the septic program start?

Abernathy: After the research was done, watershed protection groups began developing plans to address the problems. Starting in 2012, we worked with the Water Resources Research Institute to apply for a grant under Section 319 of the Clean Water Act. It's federal money that comes from the EPA and is administered by the state.

The focus for our grant is reducing human pathogen sources in three counties, Boyle, Garrard and Lincoln. Our program is about more than sep-

What we do
hear all the time
are comments from
people who say they've
lived at a place for 30
years and everything
works fine, and they don't
understand why
they need to pump.

- Bridget Abernathy

tic systems. It's about water quality generally, and that means all pollutants. So in addition to the septic program, we have one educator who works in schools to educate children about stormwater runoff, water quality and ways to reduce pollution.

Pumper: What do people in the septic program receive?

Abernathy: Our grants will pay for up to 80 percent of the cost to repair or replace a system and a free pumpout. Sometimes that means another septic tank. Some people opt for advanced treatment units, but not through our program.

To be eligible for a grant, homeowners must attend one of our workshops, and we hold those every three to four months.

Pumper: How much interest have you attracted?

Abernathy: We don't have a large number of people at each workshop, but we do have steady attendance, typically 10 to 15 per session. We publicize workshops through the local paper, on radio, social media, through the University Extension Service, through local health departments and other partners. Typically people come because they think they have a problem,

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and we find that if people live within the watershed they usually do and are eligible for assistance.

Pumper: How much knowledge do property owners have?

Abernathy: We've found pretty limited knowledge of anything related to water quality, and probably minimal or moderate knowledge about septic systems. What we do hear all the time are comments from people who say they've lived at a place for 30 years and everything works fine, and they don't understand why they need to pump.

Pumper: How are wastewater professionals involved?

Abernathy: Through the Kentucky Onsite Wastewater Association, local health department professionals talk about septic systems and how they work, how important they are, how soil acts as a filter and purifier, and about the grant program and how it works. They also cover system care, and they help us tell people about the workshops. Local certified septic contractors have also attended our workshops, helped spread the word about the program and assisted with septic repairs.

Pumper: How much does the grant cover?

Abernathy: On average, the people we help receive \$5,000 for repairs. Pumpouts are \$350, and that includes excavation and riser installation.

Pumper: What is your total grant amount?

Abernathy: The total we have to work with is \$622,000. Of that, \$371,000 comes from the EPA and the remaining \$250,000 is matching money from the state and other sources. People can apply for grants every year, and a grant lasts for three years. So far we have 16 repairs completed with another 15 under contract, and we have 13 finished pumpouts with another 16 under contract. And in our very rural area we have eight to 10 different contractors working with us.

Pumper: When does the grant end?

Abernathy: Our funding runs through the end of 2016, but when you think about the fact that 37 percent of systems along one stream are failing, I think this is a program that needs to run for many more years. There won't be a measurable effect on water quality during just the few years of our present grant. We're planning to apply for additional funding during the next round of grant applications and hope to be successful because of our well-established relationships with local professionals.

Ideally, this program would exist across a larger portion of our 20-county service area, but the EPA tends to focus its money on places with strong watershed-protection plans. The three counties we're in now had those.

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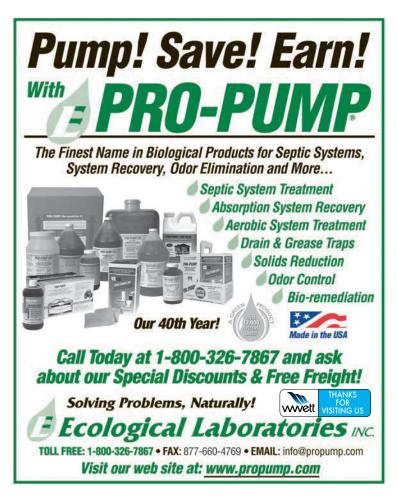


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Jim Anderson, Ph.D., is an emeritus professor at the University of Minnesota Department of Soil, Water and Climate and recipient of the pumping industry's Ralph Macchio Lifetime Achievement Award. Email Jim questions about septic system maintenance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

'Septic Systems Will Take Care of Themselves.' Wrong!

The Answer Man says: Don't believe everything you read in the papers By Jim Anderson, Ph.D.

t's always interesting to see how people unfamiliar with the inner workings of septic systems view the maintenance process. This usually involves a good laugh on our part, but it also has a serious side. It shows that we have a continuous need to educate the public about how systems work and that what they do can either help or hurt their operation.

Pumper editor Jim Kneiszel found a column by Rich Moran published in the *St. Helena Star* in Napa, California. I will provide a few snippets from that article because, though written in a humorous vein, it shows how far we have to go in our education efforts.

Here is the first quote: "Ignored, a septic system will solve all of its own problems. Septic tanks contain magic chemicals and bacteria that make it as good as new if left to its own devices. If left alone long enough, any suspicious internal plumbing problems will be fixed by the complete lack of attention to the septic system."

LET'S TALK MAINTENANCE

How many of your customers have this type of view? They are the ones you see only at times of extreme emergency, typically at some inopportune time relative to holidays. In Moran's case, he is apparently a seasonal resident, only at the country vacation home for brief periods of time.

One of the first suggestions to a homeowner following an "emergency" goes like this: "Let me get you on a regular inspection and maintenance program so we can anticipate these problems in advance and take care of them before a backup at the Fourth of July cookout." The system does not take care of itself. No matter what type of system, it needs some level of regular maintenance. For the septic tank, maintenance means the periodic removal of accumulated sludge and scum, cleaning the effluent screen and inspecting the system to see that the baffles are sound and in place.

For systems that utilize pumps, the homeowner should be reminded that pumps are mechanical, so the pump tank and pump should be regularly inspected to ensure solids are not entering the tank. Make sure the pump, electrical connections and floats are in good working order.

One of my local pumper friends has shared his frustration with customers who at first ignore alarms, then try every other solution before calling him and expect him to be there immediately to solve the problem. Hopefully you do not have a lot of customers like this. This is one example of day-to-day issues that need to be dealt with. Articles promoting the do-nothing approach, no matter how humorous, are not helpful.

GREMLINS IN THE PLUMBING

Writer Moran states, "The leachfield is a mysterious part of the septic

We know a septic system has a finite capacity and that how it is used will have a large impact on whether it will perform long term. This should also be a part of the conversation with the homeowner: that everything they can do to control water use in the residence is important.

system that doesn't require any work either. The leachfield is like an underground octopus that moves the vitamins out of the septic tank to somewhere in your neighbor's yard. Like the septic tank, the leachfield never fills up."

We know a septic system has a finite capacity and that how it is used will have a large impact on whether it will perform long term. This should also be a part of the conversation with the homeowner: that everything they can do to control water use in the residence is important. This could be things like spreading wash out over the week rather than doing it all on Saturday morning.

One more statement from Moran was informing: "I suspected we had gremlins and plumbing problems in the old house based on strange noises. Each time the disposal in the kitchen was turned on, the water in every toilet in the house would gurgle and swirl like a witch's brew."

Moran and other homeowners need to recognize that the garbage disposal adds water and solids to the system and is better unused or removed from the kitchen. If the disposal is used, additional solids load requires more regular maintenance. In fact, a lot of those solids are harder to break down in the anaerobic environment of a septic tank.

WE'RE NOT JOKING

I'm sure each of you can add similar stories and experiences to these examples. The point is that we should not let articles like Moran's go unchallenged no matter how humorous we think they are. There are people who see this misinformation as justification for not being proactive about caring for their systems.

It's not that I am against humor. As a matter of fact I use it all the time in workshops and personal interactions. But as an industry we are sometimes viewed as only a short-term or last-ditch solution to wastewater treatment needs, so anything we can do to change perceptions is important.

In the future I will discuss some other questionable advice you may see in print and on the Internet, such as the suggestion to add a cup of baking soda a week to keep your system working. \blacksquare



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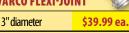
















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Erik Gunn is a business writer in Racine, Wisconsin.

Avoid Tricks and Traps of the Credit Card Industry

Follow these tips to find the best card deal to conveniently cover your monthly business expenses By Erik Gunn

bout 546 million credit cards from the four major card issuers (Visa, MasterCard, American Express and Discover) were in circulation in the United States in 2012, according to the February 2012 *Nilson Report.* That works out to about two cards for every person over 20.

Like any other tool for your business, effective credit card use means careful analysis and firm control. A credit card is a loan. Evaluate it as you would any loan – and don't get swayed by those tempting promises of low introductory fees, cash rebates and airline miles.

WHY USE A CREDIT CARD?

Even if you run your business primarily on cash, you may have monthly or annual payments that you don't want to forget or delay – things like your photocopier lease, landline, cellphone bill, office lease payment, insurance premiums and so forth.

By setting up an automatic credit card payment for the item, you make sure those bills are paid on time. The other step is to make sure you pay off the resulting credit card debt. So set up your business bank account to pay the full amount of those fixed costs back to your credit card each month a few days before the card's bill is due.

Your phone stays on, the credit card bill gets paid off each month, maybe you get some airline miles in the bargain, and you're happy. (Not to mention that you get an itemized statement at the end of the year that will make your accountant happy.)

Why not just write a check or use a debit card for those expenses? Because you want them to be paid even if you're so busy you don't have time to eat lunch, let alone pay the phone bill. But there's another reason, too: You don't want automatic payments drawn from a debit account. A hacker can drain your bank account in a heartbeat, and the more entrances into your account (like automatic payments), the more vulnerable you are.

Of course, your bank will get you the money back, but it can be a massive inconvenience and you may have no cash at all for several days. But with a credit card, your liability in fraudulent transactions is limited to \$50 if you report a problem immediately.

If your card offers additional warranty protections worth using, buy equipment this way – but only if you will pay off the balance immediately. But first, read the fine print and ask your lawyer or accountant when it's a big piece of equipment; your dealer or manufacturer's warranty might be just as good. Still, a card-based guarantee is worth asking about.

BUSINESS OR PERSONAL?

Of course you're going to pay the business credit card bill from your

If you can realistically pay off the transferred balance while the introductory rate is in place, then it might be a workable solution. If not, don't borrow trouble.

business checking account; you already know that you need to separate business and personal expenses – which means keeping your business credit card for business only. That brings us to a more complicated wrinkle, though.

Some credit cards are specifically marketed as "business" credit cards – NerdWallet.com, Bankrate.com, CreditCards.com and CreditKarma.com all list various offers from credit card companies, with guides to finding cards with lower interest rates, good points-for-purchase structures or lower annual fees. Be aware that the sites have partner relationships with some of the card issuers and will highlight the offers of their partners – whether those are the best offers for Joe Business Owner or not.

And it gets trickier.

Your personal credit card comes with certain protections under the Credit Card Accountability Responsibility and Disclosure Act of 2009, or CARD. You can't be billed twice in the same cycle; payments have to be applied to the high-interest portion of your debt if you have more than one interest rate; interest rate changes have to be announced in writing 45 days before they go into effect; and the company has to give you at least 21 days to pay the bill.

Business cards, however, do not come with these protections. The card company can raise your rate without notice. Your payments can be applied to the balance with the lowest interest rate first, which costs you more money over time. And rate increases can be applied retroactively, so what you thought you financed at 12 percent is suddenly being financed at 15 percent.

So can you skip using a "business" card and earmark a specific card to take advantage of CARD protections? Consult with your accountant and attorney first. You qualified for that card – even if all you use it for is business – based on your personal credit history.

It's imperative that if you've incorporated your business to shield your personal assets, you must keep that distinction in use of credit cards as well. At the very least, don't use the same card for business purchases that you use for personal purchases, not even once, or you risk exposing your personal assets to judgments against your business.



GETTING THE BEST CARD

Check for:

Interest rates. Look for the lowest rate possible, right? Yes - unless, and only if, your cash flow allows you to pay off the entire balance each month. Then you can focus instead on lowering other items, like the annual fee.

Penalty fees, over-the-limit fees, interest rate hikes. Read that boring fine print in the cardholder agreement, not just the hype in the card offer. Penalties for missing a payment and fees for exceeding your spending limit alone might not be so bad, but the real consequence is that your interest rate may go up. Look for the "default rate" - that can be as much as 10 percent more than the standard rate.

Rewards. Will you really use them - and do they justify the annual fee? If there are so many exclusions and qualifications that you only get \$10 worth of rewards over three months, that \$75 annual fee doesn't look like such a bargain.

Keep checking. Frequently review the terms of the cardholder agreement you have and compare it to what's currently available elsewhere.

BALANCE TRANSFERS

It looks great: Open a new account at a lower interest rate, transfer a big chunk of your outstanding balance to the new card, and you're paying less interest. Win-win, right?

Well, maybe. If you haven't opened a new account in a year or two, and if your credit is excellent, then this can work well. But credit scores are calculated partially on the basis of total utilization - meaning if you have \$100,000 total credit available now and your balance is at \$80,000, a new company may grant you only \$20,000 additional credit.

You then transfer \$20,000 to the new card - but you've still got \$60,000 at the higher interest rate.

Also, that wonderful lower rate isn't forever. Check for the difference between the card's introductory rate and the standard rate, and how long the new rate lasts. If you can realistically pay off the transferred balance while the introductory rate is in place, then it might be a workable solution. If not, don't borrow trouble.

The bottom line: Credit cards can help streamline payments you need to make no matter what, but you need to manage debt carefully and keep a careful eye on card agreements to make sure you're not paying more in fees and interest than you're getting back in rewards.



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No More Tiers

Diesel manufacturers are delivering off-road equipment that meets Tier 4 Final standards. Two suppliers explain what's changed — and what hasn't. By Peter Kenter

ff-road diesel engines have made significant strides since the U.S. Environmental Protection Agency adopted Tier 1 emission standards in 1994. Tier 4 standards have been phased in since 2008, with the strictest Tier 4 Final requirements to reduce nitrogen oxides (NOx) and particulate matter (PM) incorporated last year and this year.

However, Tier 4 Final standards are outcome-based, not prescriptive — each manufacturer is permitted to achieve outcomes using its own solutions and technology. On hand to discuss their approaches are Joe Mastanduno, account manager, rental marketing, with John Deere's Construction and Forestry Division, and Brad Stemper, solutions marketing manager with CASE Construction Equipment.

What differences will operators see in off-road vehicle engines in Tier 4 Final?

Stemper: Selective catalytic reduction (SCR) has allowed manufacturers of excavators and other machines to meet the NOx standards of Tier 4 Final most efficiently. Our excavator solution involves a more efficient SCR system in combination with a diesel oxygen catalyst that uses a chemical process to break down particulates into less harmful components, reducing overall emissions by up to 95 percent. We didn't want to stack up technologies that could use more fuel, affect peak horsepower or force us to redesign the machine envelope for technologies that would adversely affect our purchase prices, particularly on small- to medium-sized equipment.

Mastanduno: Our approach at John Deere has been to build on proven technologies, including cooled exhaust gas recirculation (EGR), exhaust filters and variable geometry turbochargers. We refer to this as the building block approach. Particulate matter levels established in our Interim Tier 4 designs will be maintained, while NOx will be further reduced by about 80 percent. This NOx reduction will drive the need for a new technology called SCR to be added to engines above 75 hp. This technology will require an additional fluid called diesel exhaust fluid (DEF), therefore a tank, lines, pump and nozzle are all new components associated with Tier 4 Final. Due to the continued usage of cooled EGR, the DEF consumption will be quite low, which allows for smaller DEF tanks and lower DEF costs.

How do these changes benefit contractors?

Stemper: Contractors don't care about how Tier 4 Final is being resolved. They want a machine that runs the same, offers the same or better efficiency, costs less and earns them more money. We used the emission mandate as an opportunity to improve our machines. For example, we looked at ways to integrate hydraulics and electronics to create a variety of work

selection modes and make the machines more efficiently leverage movement and stored power.

Mastanduno: Aside from the obvious benefit of lower engine emissions, John Deere has worked to provide additional benefits as well. A great example of this is in the telematics, which creates the ability to monitor engine performance remotely, diagnose any problems and report them to the owner. We can also update diagnostic software remotely and seamlessly using our exclusive communications tool, JDLink.

Have Tier 4 Final engines sacrificed any power?

Stemper: Power hasn't been sacrificed between Tier 4 Interim and Tier 4 Final because power range is still a deciding factor in a contractor's purchase. On earlier versions, we reaped the efficiencies of going electronic, using high-pressure common rail fuel delivery and increasing performance with reduced engine size, so we haven't sacrificed horsepower with Tier 4 Final.

Mastanduno: People aren't willing to sacrifice power or torque.

People aren't willing to sacrifice power or torque. Through all of the changes, the power and performance of our engines have remained the same with no degradation in reliability, responsiveness or ease of operation.

Joe Mastanduno

Through all of the changes, the power and performance of our engines have remained the same with no degradation in reliability, responsiveness or ease of operation.

Are there any increased requirements for maintenance?

Stemper: The SCR system found in our new excavator line requires the use of DEF. However, as a whole the equipment is migrating to a longer life cycle, longer time between oil changes and longer service intervals. There's no diesel particulate filter that needs to be changed and no related regeneration.

Mastanduno: The exhaust filter is integrated into the engine design, which continuously regenerates and cleans it during normal engine operation without operator involvement. The initial EPA requirement was that diesel particulate filters needed to last 3,000 hours before ash removal. We're now up to 10,000 to 15,000 hours, which is often the life cycle of construction equipment before people retire or sell their machines. Operators will now have to change a small DEF filter along with routine maintenance.

(continued)



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Have off-road contractors become more savvy about maintaining supplies of DEF?

Stemper: The industry has adapted to that, primarily because the trucking industry drove demand before off-road requirements were phased in. Customers in remote locations are now seeing fuel delivery trucks carrying DEF. As Tier 4 Final becomes applicable to vehicles with lower horsepower, we're now seeing a brand-new customer base being exposed to the need for DEF for the first time — owners of skid-steers and backhoes, and small landscape companies, for example.

Mastanduno: Fueling companies have adapted well to the market needs and they're routinely supplying DEF along with diesel fuel. DEF can be purchased in numerous ways ranging from simple 2-gallon jugs to bulk delivery.

Any new engine monitors or alarms?

Stemper: One change is that some systems no longer require operator intervention. For example, the SCR technology doesn't require the operator to regenerate the system. In short, there are fewer bells and indicators in our Tier 4 Final.

Mastanduno: We've added sensors and monitors to the equipment, but we didn't want to add flashing lights just because something is happening. Do you need to see a light flashing when a filter is going through a self-cleaning cycle? Manufacturers struggle with the right level of information to provide the operator, and we will only flash a light when it's something that requires action from the operator.

Does Tier 4 Final offer retrofit possibilities?

Stemper: Today's engines are very complex, from electronic engine

management, to exacting exhaust pressures entering the catalytic chamber and leaving it. To retrofit, you not only have to add equipment, but understand how it works with every other part of the engine and then go through the process of finding a way to monitor it. I would say it is difficult and becomes cost-prohibitive to the owner.

Mastanduno: Retrofitting will continue to be an option for contractors who own older machines and have a need to bring the emissions up to a higher standard than what they were originally designed to meet. This need is often tied to certain contracts or local air-quality requirements. At this time the retrofits John Deere offers will improve both PM and NOx emissions but generally are not capable of achieving Tier 4 standards.

The EPA is always looking to the future. What could Tier 5 look like?

Stemper: Europe is currently looking at implementing standards for CO2 exhaust emissions. We're hearing rumblings in the industry that this might be introduced in North America but nothing has been formally decided yet.

Mastanduno: If it does happen, we might see attention paid to smaller particulates or fuel consumption controls. However, for off-road vehicles, setting a standard for fuel consumption could be very difficult. How do you measure the fuel efficiency of a skid-steer against the efficiency of a motor grader? ■





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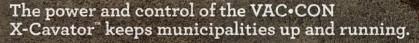




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Kentucky Onsite Wastewater Association www.kentuckyonsite.org; 855/818-5692

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

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

New Mexico

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

New York

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

North Carolina

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

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

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

∩hio

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

Oregon

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

Pennsylvania

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

Pennsylvania Onsite Wastewater Recycling Association www.powra.org

Pennsylvania

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

Tennessee

Tennessee Onsite Wastewater Association www.tnonsite.org.

Texas

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

Virginia

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

Washington

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

Wisconsin

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

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

NATIONAL

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

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

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

CANADA

Alberta

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

British Columbia

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

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

Manitoba

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

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

New Brunswick

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

Nova Scotia

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

Ontario

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

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

Saskatchewan

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

Canadian Regional

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





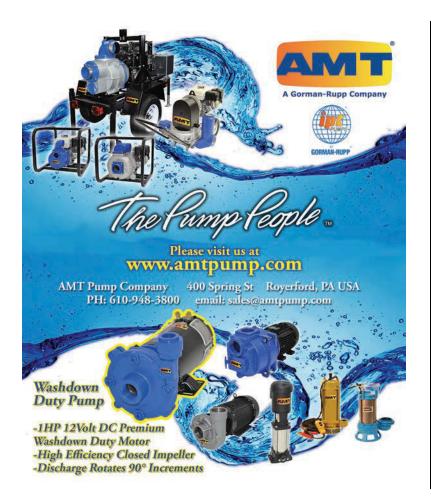
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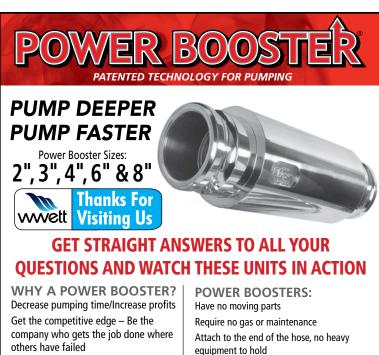
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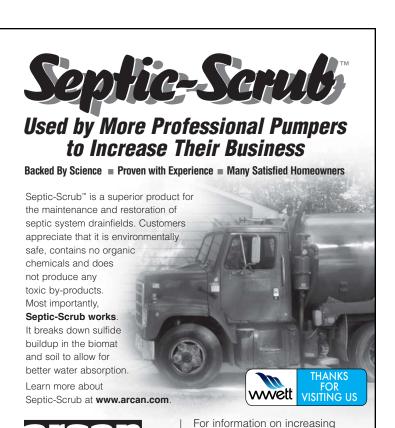


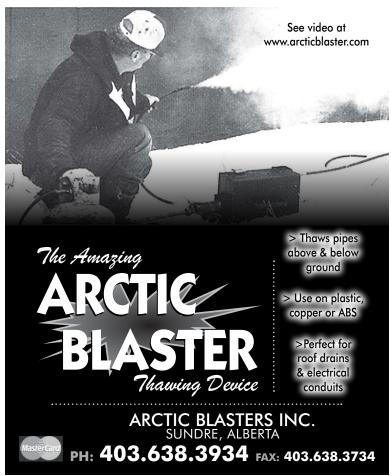
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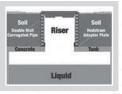
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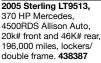


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2017 M2 with 2500 Gal. Imperial Tank, 380 CFM Pump, 300 HP ISL Cummins, Allison 3000RDS Auto., Air Ride, Diff. Lock. 434003



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More Training and Networking **Opportunities Coming Soon**

By Dhru Bhatt

ere is what's on the horizon for the National Association of Wastewater Technicians in 2016 and beyond:

NAWT/NOWRA 2016 Onsite Wastewater Southwest Mega **Conference**

NAWT will be a part of the 2016 Onsite Wastewater Southwest Mega Conference that the National Onsite Wastewater Recycling Association



COLORADO

CO Soils Assessment

May 19-20, 2016 Golden, Colorado Instructor: Warren Brown/Roy Laws Contact: Lisa Nicoll Email: cpow@cpow.net Phone: 720.626.8989

NAWT Inspector Course November 17-18, 2016

Instructor: Kim Seipp/Warren Brown Contact: Lisa Nicoll Email: cpow@cpow.net Phone: 720.626.8989

ARIZONA

UA/NAWT In-depth Technology-Specific Education

April 22, 2016 Location TBD Instructor: Kitt Farrell- Poe Contact: Bernadette Capossela -Univ. of AZ Email: bcaposse@email.arizona.edu Phone: 520.621.3691

NAWT Inspection Training & Workshop

August 29-30, 2016 Holiday Inn, Casa Grande Instructor: Kitt Farrell- Poe Contact: Bernadette Capossela -Univ of A7 Email: bcaposse@email.arizona.edu Phone: 520.621.3691

UA/NAWT Soil & Site Evaluation for Onsite Wastewater Systems

October 17-18, 2016 Location TBD Instructor: Kitt Farrell- Poe Contact: Bernadette Capossela -Univ. of AZ Email: bcaposse@email.arizona.edu Phone: 520.621.3691

TEXAS

NAWT Inspection Training & Workshop

March 18-19, 2016

New Braunfels TX Instructor/Contact: Brian Murphy Email: brian@a-action.com Phone: 817-467-0213

NAWT Inspection Training & Workshop

September 23-24, 2016 Arlington TX Instructor/Contact: Brian Murphy Email: brian@a-action.com

Phone: 817-467-0213

For more information call:

YOUR SOURCE FOR 800-236-6298 (NOWRA) is coordinating in Reno, Nevada. For more details regarding the Mega Conference, please visit www.nawt.org.

WWETT 2017 - Inspection Course (combining sections I and II)

NAWT is planning to conduct a one-day inspection course at the 2017 Water & Wastewater Equipment, Treatment & Transport (WWETT) Show. This course will accommodate those who are seeking a NAWT Inspection renewal. However, individuals seeking renewal can use their certificates of completion from the one-hour sessions during Education Day, which will be held during the WWETT Show, provided they are septic-related.

Online course development

In 2016, NAWT is launching online courses, which will consist of educational videos and materials, along with an exam at the end of the online course. Individuals seeking specific training to receive a certificate of completion can now do so from the comfort of home.

Workshops for individual companies

In 2015, NAWT held workshops for individual companies training their employees on specific aspects of the wastewater industry. Due to the success of these training workshops, NAWT is exploring additional possible opportunities to train employees at companies. If you are interested in conducting a workshop at your facility and would like NAWT to manage and administer the educational sessions, please contact the NAWT office at 800/236-6298.

Soils classes

NAWT is planning to partner with state associations to explore the development of soils classes and to make sure soils classes being offered meet NAWT requirements for certificate renewal. Since understanding soils is a key to design and installation of long-lasting onsite systems, the Education Committee feels it is important to promote development of soils classes.

Fall 2017 Waste Treatment Symposium

NAWT is in the planning stages for its fall 2017 Waste Treatment Symposium. If you are a vendor interested in getting involved with the Waste Treatment Symposium, please contact the NAWT office for further details. ■













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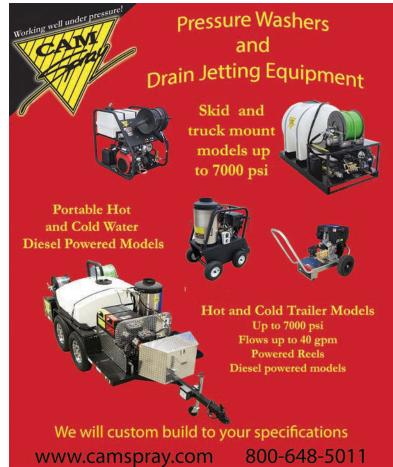


2005 International 5600l with 2013 Guzzler CL | Truck ID #50572

- ISM 320V engine has been rebuilt
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eff and Austin Mercer built out a Viper red 2006 Sterling truck with a 3,000-gallon steel Specialty B Sales tank and Patriot 3000 pump (Magnum Venus Products). The truck is powered by a Caterpillar C-13 380 hp engine matched with a 10-speed Eaton Fuller transmission. The father-and-son team assembled the truck out in their welding shop, adding top and rear manways, dual 3-inch inlets and 4-inch outlets, three sight glasses and rear work lights. The truck features aluminum wheels, air-ride seat and work lights. The lettering was also done in-house with the Mercers' laser-cutting machine. Austin is the driver and the truck is used for residential septic service.

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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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Onsite Septic Systems and Maintenance

By Craig Mandli

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The **Filter Alarm (Smart Alarm)** from **Polylok** is a wired indoor/outdoor filter alarm that activates when the filter cartridge is near capacity (approximately 90 percent full) of solids buildup. The switch, installed in the filter, sends a signal to the alarm panel, activating the audible and vi-



sual alarm to alert the home or business owner of necessary service. It has a manual alarm test switch and horn silence, alarm horn rated at 82 dBA at 10 feet, and 15 feet of cable (with longer lengths available). It will fit Polylok, Zabel or Best filters. **800/701-3946**; www.polylok.com.

SEE WATER

SEE WATER HLA LIQUID LEVEL ALARM SERIES

The **HLA Liquid Level Alarm Series** from **See Water** includes the HLA Type 1 indoor-rated alarm, the HLA-4X indoor/outdoor robust alarm and the HLA-4X-X, which is available in a variety of models ranging from two to 10 alarm points. The alarm panels are ideal for tank monitoring, sewage pump chambers, sump pump

basins and other liquid level monitoring applications. They are UL listed. 888/733-9283; www.seewaterinc.com.

SJE-RHOMBUS PS PATROL

The **PS Patrol** pedestal-style high-water alarm system from **SJE-Rhombus** provides a convenient location to connect all wiring required for a pumping station application. Its receptacle accepts a 120-volt pump and piggyback pump switch. The sleek, angled design of the clear Type 3R enclosure includes a removable cover for easy access for field wiring. All internal components are sealed within the cover for protection from the elements. The red LEDs illuminate the top of the cover in an alarm condition for 360-degree visual identification. The controller accepts a 5-inch square plastic post or 4-inch pipe/



conduit for mounting. 888/342-5753; www.sjerhombus.com.

ATUs

ANUA PURASYS

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



BIO-MICROBICS FITT-EE

FITT-ee wastewater treatment systems from Bio-Microbics create an optimized treatment environment using submerged, fixed-film media for microbial growth with an energy-efficient aeration system. The engineered airlift provides constant aeration and mixing throughout the media for maximum biomass activities. This method of operation also allows the system to withstand periods of high and low input that upset most treat-

ment systems, including those in nitrogen-sensitive areas or limitations with distance to groundwater and/or smaller dispersal field size requirements. Used for new construction or retrofit in existing tanks, the systems are engineered to fit most typical small-flow residential and commercial applications. 800/753-3278; www.biomicrobics.com.

NORWECO HYDRO-KINETIC BIO-FILM REACTOR

The Hydro-Kinetic Bio-Film Reactor from Nor-weco is a high-performance, low-maintenance, no-energy solution to wastewater treatment. Attached growth filtration media provides a level of wastewater treatment exceeding U.S. and Canadian standards. It is installed after any onsite wastewater treatment system to produce clear and clean effluent prior to discharge to an absorption area. The compact,

one-piece design weighs less than 500 pounds and is easily transported and installed. **800/667-9326**; www.norweco.com.

PREMIER TECH AQUA ECOFLO PACK

With a single monobloc unit integrating a primary tank and a biofilter, the Ecoflo PACK from Premier Tech Aqua is suitable for both primary and secondary homes with a 600 gpd capacity. The NSF-certified system is based on a proven compact filter technology that treats wastewater without energy and retains pollutants, thanks to 100 percent organic filtering media. It offers ease of maintenance and all the benefits of a recyclable filtering media that can be accessed via the lid at the end of its useful life. It is available in ready-to-use rotomolded polyethylene shells or as a kit to be integrated into concrete tanks, reducing transport logistics and wait time. 604/346-8199; www.premiertechaqua.com.

BACTERIA/CHEMICALS - SEPTIC

ARCAN ENTERPRISES SEPTIC-SCRUB

Septic-Scrub chemical additive from **Arcan Enterprises** helps remove the sludge that builds up and sticks to the stone in a drainfield, pit or sand mound, helping rejuvenate the drainfield. According to the maker, it is fast-acting, working in the first 24 hours after application. It allows an



installer to add a drainfield treatment option to their business and can serve as part of a maintenance program. It works with all types of systems, is safe to handle and is environmentally friendly. 888/352-7226; www.arcan.com.



BIONETIX INTERNATIONAL BIO-TAB 1T

Bio-Tab 1T from **Bionetix International** can be used to treat undigested sludge to help keep septic systems healthy and functioning. Each tab contains a 1-trillion count of bacteria as well as enzymes effective

in aerobic and anaerobic conditions. Biological nutrients and stimulants enhance the water biology in the tank by aiding bacteria to biodegrade organic material composed of proteins, fats, carbohydrates and toilet paper. It is especially efficient after toxic shock, such as the use of strong harmful chemicals like bleach or root killers. Just add two tabs to the tank in the first month, followed by one tab every month for maintenance as well as one tab after any toxic treatment. 514/457-2914; www.bionetix-international.com.

BIOSTIM SEPTIC SAVER

Septic Saver from **Biostim** is a multi-strain microbial additive that supercharges septic systems to prevent foul odors, slow drains, seep-hole blockages and excessive septic tank pumping, according to the maker. Regular use can help keep systems free flowing by digesting fats, oil, grease, soaps and other organic household waste, and prolong the life of the system. It is safe for plumbing systems in homes, RVs, portable



toilets and sewer lines. It contains no caustic or corrosive chemicals, free enzymes, emulsifiers or surfactants and does not cause grease to pass through to the leachfield where it can re-solidify and cause a septic field failure. To treat, pour it into the toilet and flush. 800/338-8812; www.biostim.com.



CAPE COD BIOCHEMICAL CO. AFTERSHOCK

AfterShock soil absorption restorative from **Cape Cod Biochemical Co.** is designed to help restore drainage to clogged and sluggish drainfields and drainage structures. The USDA-approved, environmentally safe product contains multi-strain *Bacillus* spore-bearing bacteria and a time-release oxygen source that biologically

digests the solid material that normally clogs soil absorption areas. The oxidizer accelerates the activity for an extended period, also helping degrade sulfides in the biomat to further promote drainage. It is designed to be used in conjunction with high-pressure waterjetting and soil fracturing equipment. It can be applied in one day, eliminating the need to keep the system exposed for repeated site visits. 800/343-8007; www.septiconline.com.

DEL VEL CHEM CO. TSS

TSS (Total System Solution) liquid biostimulant from Del Vel Chem Co. is designed to help eliminate FOG and toxic odors. It is created from highly humified peat sources, then liquefied through a stabilization and extraction process. It stimulates existing microbes, transferring FOG into naturally occurring byproducts of organic degradation. It maintains its effect through the pipes leading to sewer lines or septic systems without damage, re-



ducing maintenance and eliminating the need for trap pumpouts and pipe jetting. It is available in cases of 12 16-ounce bottles, eight 64-ounce bottles or 5-gallon pails. **800/699-9903**; www.delvel.com.



DRAINBO SEPTIC TREATMENT AND CLEANER

Septic Treatment and Cleaner from **Drainbo** is designed to help keep septic systems clean and clear with three paths of action. First is to treat all drainlines and sewage systems in the home. Second is to increase the digestion of waste in the septic tank through its multi-strain biological formula. Third is the digestion and removal of sludge deposits in the leachfield. It is certified by the Natural Products Association and is a USDA Certified Biobased Product. Private labeling is available. **877/372-4626**; www.drainbo.com.

BACTERIA/CHEMICALS - SEPTIC

ECOLOGICAL LABORATORIES PRO-PUMP/HC

PRO-PUMP/HC liquid live bacteria from **Ecological Laboratories** is a blend of more than 30 microorganisms selected for broad-spectrum application in industrial and wastewater treatment. Its performance results in the rapid breakdown and removal of fats, oils and greases that build up



in septic tanks and absorption fields. It is a consortium of vegetative non-spore-forming bacteria that exhibits performance in low-oxygen facultative anaerobic environments. Regular treatment can help reduce surface solids, bottom solids and odor, satisfying customers and making pumpouts more cost-effective. 800/326-7867; www.propump.com.



GREEN WAY EARTH WORKS WATER TREAT GT

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odor, reduce fats, oils and grease, reduce corrosion and promote healthy wastewater containment systems. The primary active ingredient, an organic histosol, binds up hydrogen sulfide, mercaptans and ammonia to reduce odor. Selective bacteria strains are added to break down grease and waste and reduce suspended solids. It will also condition the inside of a vacuum truck's holding tank during transport, reducing foul tank odors. It is available in mulberry and pine fresh fragrances, and offered in 1-, 5-, 7- and 55-gallon containers. **800/241-7951**; www.polyportables.com.

J & J CHEMICAL NUTANK

NuTank septic system treatment from J & J Chemical is designed to replenish the enzymes in a septic tank. Its concentrations of billions of specific bacteria are engineered to break down solids, scum and sludge for a healthier septic system. Monthly use can help reduce the potential for backup and drainfield damage. It can help



boost the progression of the decomposition process and help keep the tank and drainfield operating correctly, even battling harsh detergents and anti-bacterial products. Monthly application involves adding one self-dissolving packet into a drain or toilet and washing or flushing. It is safe for all plumbing and environmentally friendly. It is designed to be resold by septic pumpers, prepackaged in 12 packets per jar and 12 jars per case. A company's contact information can be added to each jar. **800/345-3303**; www.jjchem.com.

ONE BIOTECHNOLOGY BIOONE

One Biotechnology's BioOne biological drain and septic system maintainer helps keep drains flowing freely and reduces odors and costly backups between pumping, according to the maker. It does not contain added enzymes or caustic agents and does not emulsify FOG and move it down the line. It has met the U.S. Environmental Protection Agency Safer Choice challenge, which means that every ingredient in the product has been reviewed by EPA scientists. Only products meet-



ing their Safer Choice Standard, which includes stringent human health and environmental criteria, are allowed to carry the label. 800/951-4246; www.1biotechnology.com.



RCS II SEPTIC DRAINER

Septic Drainer drainfield restorative from RCS II is designed to repair the soil in a septic drainfield damaged by hardpan soil issues. Due to restricted airflow, this hardpan soil layer causes aerobic bacteria to die off. Only anaerobic bacteria can survive without air. Anaerobic bacteria produce a waste product called biomat, which compounds drainfield failure. The solution is designed to remove the bond between sodium and the soil, which creates hardpan. The manufacturer recommends using it first to solve underlying hardpan

issues, then adding an oxygenator or aerobic bacteria to speed up the restoration process. **518/812-0000**; www.septicdrainer.com.

ROEBIC LABORATORIES ROETECH SEPTIC SYSTEM CLEANER

Regular use of **Roetech Septic System Cleaner** from **Roebic Laboratories** is designed to help prevent clogging of inlets and outlets. Septic systems receiving wastewater from food preparation areas tend to have high influent levels of FOG, BOD and sanitizing agents. This is formulated to handle high-load wastes and works throughout the system degrading FOG, proteins, starches and paper, in addition to many types of cleaners and sanitizing agents used



in the food service industry. 203/795-1283; www.roetech.com.



SCIENCO/FAST MIGHTY MIKE U&F-BOOST!

Mighty Mike U&F-BOOST! (Billion Onsite Organisms Sewage Treatment) tablets from Scienco/FAST use a special formulation of over

25-billion-per-gram active, robust Class 1

organisms to consume organic waste and break fat down naturally. Once introduced into the waste stream, the water-soluble tablet immediately activates and feeds on the surrounding waste to provide a healthy population in the system. No premixing, premeasuring or presoaking is necessary. **800/652-4539**; www.sciencofast.com.

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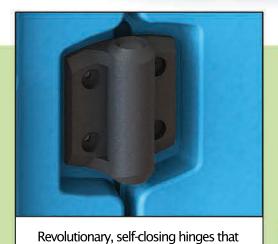


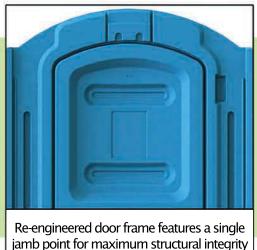


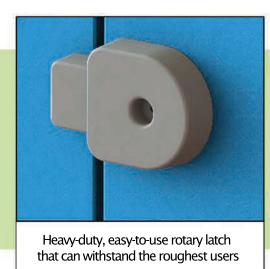
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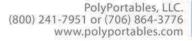




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BACTERIA/CHEMICALS - SEPTIC

WALEX BIO-ACTIVE SEPTIC TANK TREATMENT

Bio-Active Septic Tank Treatment from **Walex** can help reduce solids and restore the population of worker bacteria and enzymes, helping keep septic systems healthy between recommended tank pumping services, according to the maker. Monthly application involves flushing one packet down the



toilet. It is safe for all plumbing and helps prevent backup and dissolves solids. Each bag contains a one-year supply. **800/338-3155**; www.walex.com.

DISINFECTION

SALCOR 3G UV WASTEWATER DISINFECTION UNIT

The **3G UV Wastewater Disinfection Unit** from **Salcor** is designed for residential, commercial and municipal uses that can exceed 100,000 gpd. It has a foul-resistant two-year Teflon-covered lamp for maximum UV ef-



fectiveness, easy installation and annual maintenance. The unit is UL certified NEMA 6P floodproof (30 days submerged) and NSF/Washington State Protocol-tested (six months each) with 21 upstream treatment units. The efficient 30-watt, 9,000 gpd gravity-flow unit serves as a reliable building block for larger water recovery/reuse applications, according to the maker. It helps inactivate deadly bacteria and viruses, and has a heavily conformal-coated alarm board, surge protection and EMI (electronic noise) suppression. Existing parallel/series (to 12-unit array) installations, assembled with standard ABS pipefittings, equalize gravity flow without distribution boxes. Electronic circuitry continually monitors lamp performance. **760/731-0745.**

DRAINFIELD MEDIA

ADVANCED DRAINAGE SYSTEMS SEPTIC STACK

Available in configurations of nine, 11 and 13 pipes, **Septic Stack** units from **Advanced Drainage Systems**



allow for soil contact without the use of gravel. This pipe is engineered with holes and slots, allowing it to collect and disperse the effluent as it passes over corrugations in the pipe. Using 4-inch HDPE pipe provides abrasion and corrosion resistance. With lengths of 10 feet, design flexibility is allowed due to the fast installation times. Systems are lightweight and have a high storage volume with structural strengths that will support an H-10 load rating with 12 inches of settled cover. Applications include trench low-pressure piping, pressure distribution and trench, mound and bed configuration. They are available for use in residential and commercial applications. 800/821-6710; www.ads-pipe.com.

FILTERS

SEPTITECH STAAR RESIDENTIAL TRICKLING FILTER SYSTEMS

STAAR Residential Trickling Filter Systems from SeptiTech are NSF/ANSI Standard 40, Class 1 and NSF/ANSI Standard



245 (nitrogen removal) certified. The clean effluent prevents biomat formation and leachfield clogging. They are compatible with shallow drip, direct discharge, pressure distribution, spray irrigation and conventional leachfields. Utilizing an enhanced, biological, unsaturated media filter process, they are ETV-EPA verified and NSF/ANSI Standard 40/245 certified. With an optional UV disinfection system, the systems are designed for direct discharge or water reuse and engineered to fit most typical small-flow residential and commercial applications. 800/318-7967; www.septitech.com.

SIM/TECH FILTER PLEATED FILTERS

Pleated filters from Sim/Tech Filter are available for gravity effluent filtration in septic tanks and turbine pump filtration in pump tanks. Filtration size is 3/32 of an inch in two dimensions. Flow channels in the pleated material result in increased longevity. All filter types start at over 2,000 square inches of filtration area. The 45 percent open area (over 900 square inches) is equivalent to 800 linear feet of 3/32-inch slots. Various configurations and larger units are available. 888/999-3290; www.simtechfilter.com.

LIDS

FERGUS POWER PRODUCTS DUEL POWER LIDS

Duel Power Lids and **Duel Adapter Rings** for septic

tank installations or restorations from **Fergus Power Products** are designed for new installation or to complete a restoration project by replacing a concrete lid. It is designed like the rafters in a home to give structural durability to support heavy wheel load without added weight to the lid. The top is slightly domed to meet compliance throughout the U.S. Lids can be insulated with an R-value of 6 and are available in 18-, 24-, 30- and 36-inch sizes. **218/736-6772**; **www.ferguspowerproducts.com.**



HEDSTROM PLASTICS SEPTIC TANK COVER

Septic tank covers from **Hedstrom Plastics** are designed to eliminate riser systems. The company offers 18- and 24-inch lids made from strong polyethylene UV-protected material that are lightweight for easy installation and transportation. Lids can be sand- or foam-filled for additional strength. Gasket and safety screws come standard, along with optional custom nameplates displaying a company

name and number. 888/434-5891; www.hedstromplastics.com.

(continued)



ROTOSOLUTIONS ROTO-MOLDED SEPTIC TANK LID

Roto-molded septic tank lids from **RotoSolutions** are manufactured out of lightweight and durable materials for easy handling and transport. They are sold with hardware kits that include



stainless steel components. The lids are sold in boxes of six and are made to fit 12-, 18- or 24-inch I.D. corrugated pipe. They can be used with or without the sand-filled option. They are easy to ship and install. 800/868-0973; www.rotosolutions.com.

PUMPS

ASHLAND PUMP EP50

The **EP50** effluent pump from **Ashland Pump** has a continuous-duty-rated, energy-efficient 1/2 hp PSC motor with performance reaching 105 gpm and 53 feet of head pressure. It is constructed of heavy-duty cast iron with a cast iron impeller capable of passing 3/4-inch solids. It is available in 115-volt with a wide-angle piggyback switch and also in 230-volt manual versions. **855/281-6830**; www.ashlandpump.com.



ciple uses an electromagnetically operated diaphragm, eliminating sliding parts to keep wear and tear minimal. It incorporates energy-efficient motors for low power consumption. It has a weatherproof compact alloy casing that doesn't degrade over time. It is available with a built-in alarm system that

for low power consumption. It has a weatherproof compact alloy casing that doesn't degrade over time. It is available with a built-in alarm system that can detect low pressure in the air line, alerting users via a loud buzzer and LED warning light. 770/831-1122; www.bluediamondpumps.com.



CHAMPION PUMP COMPANY 2 HP GRINDER PUMP

Champion Pump Company's 2 hp grinder pump provides flows up to 44 gpm and heads up to 104 TDH. It has a double-seal configuration with a seal-failure alarm option. The 208/230-volt single phase, ball-bearing, oil-filled motor has the option of providing the starting components in the pump, eliminating the need for control panels. It is also available in three-phase. The quick-disconnect sealed cord is available in up to 100-foot lengths for easy replacement



without disturbing the wiring in the panel and conduit. The Rockwell 440 hardened stainless steel shredder and shredder ring are designed for a long cutting life. It is offered as a packaged system with guide rails built to specifications. A standard leg kit is provided for applications where a rail system is not required. 800/659-4491; www.championpump.com.



ENVIRONMENT ONE CORPORATION UPGRADE

The **Upgrade** replacement grinder pump from **Environment One Corporation** is engineered to fit into virtually any grinder pump wet well. Universal design allows easy drop-in conversion, ready to connect. All solids including plastic, rubber, fiber and wood are ground into fine particles, allowing them to pass easily through the pump, check valve and small-diameter pipelines. The grinder is designed not to jam and for minimum wear to the grind-

ing mechanism. It comes with a self-contained level control system, eliminating float switches. **518/346-6161**; www.eone.com.

FRANKLIN ELECTRIC FPS NC SERIES

Submersible centrifugal **FPS NC Series** non-clog pumps from **Franklin Electric** meet water transfer needs in challenging commercial, residential and industrial applications. Manufactured in 3- and 4-inch Class 125 ANSI flange discharge connections, they are available in 3, 5, 7 1/2 and 10 hp models with heads up to 66 feet and flows up to 610 gpm. They can pass up to 3-inch solids, retrofit easily to any standard rail system and contain replaceable internal components for optimal maintenance. Ductile-iron-casted impellers provide added corrosion resistance and handle

rigid debris. Its Fluoroelastomer motor enclosure sealing system improves chemical and temperature resistance, and the double-row ball lower bearing offers high loading and wear characteristics. It has a field-adjustable wear plate. **866/271-2859**; www.franklinengineered.com.

LIBERTY PUMPS PROVORE

The **ProVore** grinder pump from **Liberty Pumps** is designed for use in residential applications where the addition of a bathroom or other fixtures below sewer lines requires pumping. It features the same V-Slice cutter technology utilized in Omnivore Series 2 hp grinder pumps. Powered by a 1 hp motor, it is designed to operate on a standard 115- or 230-volt circuit requiring a 20-amp breaker. No special wiring is peeded. Compact for

20-amp breaker. No special wiring is needed. Compact factory-assembled systems are available in both simplex and duplex versions. **800/543-2550; www.libertypumps.com.**

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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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ORENCO SYSTEMS BIOTUBE PROPAK

Biotube ProPak pump packages from **Orenco Systems** are complete, ready-to-install pump packages in a box. They include a Biotube filter cartridge that filters up to two-thirds of solids. Only liquid from the tank's clear zone



is pumped, significantly reducing the load on the drainfield. Biotube filters are easy to remove and clean without pulling the pump vault. They can be used for filtering and pumping effluent from single- or dual-compartment septic tanks to gravity or pressurized discharge points. Their pump vault technology eliminates the need for a separate dosing tank, reducing system cost and footprint. 800/348-9843; www.orenco.com.

ZOELLER PUMP COMPANY SHARK FRACTIONAL HORSEPOWER GRINDER SERIES The Shark Fractional Horsepower Grinder Series

The Shark Fractional Horsepower Grinder Series from Zoeller Pump Company is designed to handle difficult residential applications where sewage ejectors struggle. These 115-volt, 7- to 11-amp (and 230-volt, 3- to 5-amp) all cast iron pumps are integral automatic grinders available in 1/2 hp (803),

3/4 hp (805), and 1 hp (807) models. They offer performance heads up to 55 feet. Tri-Slice Cutter Technology provides over 300,000 cuts per minute. Non-automatic versions and package systems are available. 800/928-7867; www.zoeller.com.



PENTAIR - MYERS V2 The **V2 Series** grinder from **P**

The **V2 Series** grinder from **Pentair - Myers** is designed with computational fluid dynamics software, and has a new volute and impeller design that allows shut-off heads up to 180 feet with a single-stage centrifugal pump. This design gives operators the flexibility to change between the standard and high-head flow design by swapping the impeller and cutter plate, simplifying maintenance and reducing service parts inventory for low-pressure sewage system projects. It is available with an optional quick-disconnect cord for easier servicing in the field, double-row bearings to absorb axial and radial loads, and an oil-filled motor for cooler operating temperatures and

longer life. 888/987-8677; www.femyers.com.

REJUVENATION SYSTEMS

EARTHBUSTER DEEP SOIL DECOMPACTOR

The EarthBuster Deep Soil Decompactor is an alternative to conventional replacement and rebuilding of septic fields. It mounts via quick-attachment to skid-steers, tractors and excavators, and uses a probe to inject compressed air into the ground at depths up to 6 feet. This immediately relieves compaction and/or biomat problems, restoring soil



percolation to within normal parameters, according to the maker. The process can be completed in two to three hours by one operator. **406/215-1588**; www.earthbuster.com.

SEPTIC SERVICES MAXAIR500

The MAXAIR500 submersible aerator from Septic Services sits inside the tank and out of sight. Its efficient operation provides continual cost savings through low energy consumption. It has a continuous duty motor and stainless steel motor enclosure and legs. It's prewired and has a 15-foot power cord. The industrial-grade factory-built unit has been engineered to meet or exceed industry standards and has been put through rigorous testing in the lab and field. 800/536-5564; www.maxair500.com.

RISERS

AERO-STREAM INTEGRAL SAFETY BARRIER

The Integral Safety Barrier from Aero-Stream provides added protection from an incidental security breach of the primary septic tank cover. It is included on all Aero-Stream risers and available in heights from 7 to 50 inches in 3-inch increments, with custom heights available up to 96 inches. Its modular design minimizes freight cost and allows 33 unique configurations with 10 SKUs. The tank can be pumped without removal, but the unit can be removed for servicing baffles. It fits 24-inch-inside-diameter double-wall corrugated, ribbed and smooth-wall pipe. The adapter flange is 29 1/2 by 29 1/2 inches, with a 23 1/2-inch I.D. 877/254-7093; www.aero-stream.com.

WEBTROL PUMPS MVP SERIES

MVP Series grinder pumps from WEBTROL Pumps are constructed from 304 stainless steel and cast iron. They are engineered and manufactured to handle demanding residential and commercial applications. A hardened, anti-wear grinding ring and cutter, along with a recessed, cast iron vortex impeller, provides long life. Double mechanical seals and potted epoxy cord seals prevent water intrusion into the motor. They are available

in 1 and 2 hp, with heads up to 100 feet TDH. **800/769-7867**; www.webtrol.com.

86

TUF-TITE RISER

Tank risers from **Tuf-Tite** have internal supports or ledges to reinforce internal plastic safety lids. The ledges will strengthen the company's plastic internal safety lids or a variety of internal safety devices made by others, such as con-

crete, fiberglass or rope netting. The riser lids come with all necessary mounting hardware including safety screws. 800/382-7009; www.tuf-tite.com.

SEPTIC TANKS

DEN HARTOG INDUSTRIES ACF ROTO-MOLD

Ace Roto-Mold 1,000-gallon septic tanks from Den Hartog Industries are designed to be strong and easy to install. Manufactured from high-density polyethylene with



UV inhibitors, they have a horizontal flow designed for belowground installations up to 36 inches. The AST1000-2 double-compartment tank has been tested by NSF to meet the IAPMO Z1000 and CAN/CSA-B-66 standards. It has a trapezoidal deep-rib design and an interior divider panel, and a custommolded gasket in the lid. Manufactured from extruded nitrile rubber, the gasket snaps into the lid to ensure a watertight seal. The tank divider panel slows the flow of wastewater and directs it to the middle of the tank so wastewater can separate from solids. An outlet baffle allows partially treated liquids to flow out for further treatment. 800/342-3408; www.denhartogindustries.com.

JET INC. J-500-800PLT

The J-500-800PLT plastic tank from Jet Inc. offers a lightweight alternative to concrete J-1500 Series BAT Media Plants. The tanks provide variable treatment capacity from 500 to 800 gpd. They are rotational molded out of lightweight polyethylene material to offer a seamless tank with strength and durability. They are easy to transport and in-

stall in difficult site conditions, and are locally supported by a global network of trained and certified distributors. 800/321-6960; www.jetincorp.com.



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NORWESCO LOW PROFILE TANKS

Low Profile septic tanks from Norwesco have molded-in support columns in



the middle of the tank that are filled with flowable soil before backfilling to maximize strength, stabilize the tank during backfill and reduce buoyancy. The tanks have molded-in tie-down and lifting lugs on the corners for ease of handling. The inlet and outlet holes are predrilled. Gaskets and field-adjustable sanitary T's that can accept SDR 35 or Schedule 40 pipe are included. The one-piece tanks do not have to be assembled by certified personnel. Dual-wall pipe or PVC ribbed pipe can be used for a riser. 800/328-3420; www.norwesco.com.

ROTH GLOBAL PLASTICS MULTITANK

The MultiTank from Roth Global Plastics can be used as a water cistern, pump tank, holding tank, rainwater tank or septic tank. It is constructed of an inner layer of FDA-approved virgin HDPE, two inside layers of PE for improved sta-

bility and one outer layer of black and UV-stabilized PE. 866/943-7256; www.rothmultitank.com.



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Onsite Septic Systems and Maintenance

By Craig Mandli

ADDITIVE USED TO TREAT BLOCKAGE IN DRAINFIELD LINE

Problem: North Carolina homeowners called J.C. Johnson Plumbing & Septic when they saw water surfacing 55 to 60 feet into the drainfield area. Technician Jim Sparrow ran a camera through the line exiting the tank and quickly determined the line was almost completely full of sludge.

Solution: Sparrow installed a clean-out on the outlet end of the tank, then poured **bioForce Maxx** from **Chempace Corporation** into the line. The septic tank was also pumped down to make sure no water would be going into the field for a week. After approximately one month without incident, a camera was put down the clean-out to inspect the line. The first 30 feet had gone from being full of sludge to only about a 1/4 inch on the bottom. The line was treated again with another 5-gallon pail of bioForce Maxx.

Result: To date, there has been no further surfacing water in the drainfield. **800/423-5350**; www.chempace.com.

SYSTEMS INSTALLED SIMULTANEOUSLY ON LAKEFRONT SITES

Problem: A pair of homeowners sharing lot lines on small lakefront sites on Christina Lake in the West Kootenay region of British Columbia, Canada, wanted to repair their aging septic systems at the same time to minimize system cost and site damage. They were looking for a high-performance, low-maintenance treatment system that would fit within the limited site constraints while exceeding treatment standards.

Solution: The **Eljen Corporation GSF** system was chosen for its treatment performance (NSF Standard 40) and zero biological startup period. Two three-bedroom systems were designed by BWD Engineering and installed easily and si-



multaneously by Boundary Waste Water Systems & Excavating, limiting site disturbance and keeping costs affordable.

Result: The new systems gave the owners the treatment and performance they needed in the limited available space. The systems were installed in 2014 and have continued to perform as expected. **800/444-1359**; www.eljen.com.



INTERCEPTORS INSTALLED ALONG RUNWAY FOR INTERNATIONAL AIRPORT PROJECT

Problem: In 2014, the Westin Denver Hotel and Transit Center at Denver International Airport needed 32 grease and sand interceptors to bring light rail to the airport.

Solution: Plumbing contractors called on **Front Range Precast Concrete** to produce the interceptors. Using HALO automation equipment, the company can produce space-efficient, watertight concrete tanks quickly. Since the tanks manage many different types of waste, they come with a much higher spec than regular interceptors and are subject to much stricter testing. This and a rounded-edge waterproof design add value. Operations Manager Jay Dorwart coordinated the manufacture and tiered delivery over the project period of more than a year, involving several Front Range employees who needed to be badged-in by security, and coordination with air control to deliver tanks to sites all along the runway.

Result: The interceptors were installed and have performed without incident. **800/783-3207**; www.flxx.com.

MBR SYSTEM ENABLES DEVELOPMENT OF RECLAIMED STRIP MINE PROPERTY

Problem: Goose Lake Ranch is an 828-acre reclaimed strip mine in Fulton County, Illinois, with more than 50 lakes famous for fishing. A rehab of an existing campground and the addition of resort cabins and 90 campsites by the Herman Brothers family needed an advanced onsite wastewater treatment system to overcome site challenges and meet stringent code requirements. System designers faced coalmine spoils, inconsistent soils and drastic elevation changes.



Solution: NSF350 water recycling Bio-Micro-

bics BioBarrier Membrane (MBR) systems installed within **Infiltrator IM-Series** tanks were designed to meet the challenges. The numerous 500 or 1,000 gpd MBR units include single units for individual cabins and 1,000 gpd MBRs for clusters of resort cabins, beach houses,



a store and a banquet hall. EZflow by Infiltrator was used for the treated effluent dispersal fields, eliminating heavy trucking and the challenges of stone. The IM-Series tanks were also used for trash and pump tanks. A 1.5-amp marine pump attached to each MBR pulls the recycled water out and then transitions to gravity flow to move effluent to the EZflow dispersal fields.

Result: The IM-Series tanks allowed MBR units to be constructed in a shop to specifications and then delivered and installed around the property as needed without requiring a heavy boom truck, resulting in significant cost savings. **800/221-4436**; www.infiltratorwater.com.



AES SYSTEM USED IN LIMITED SPACE SEPTIC INSTALLATION

Problem: The septic system for an old church being renovated into a halfway house in Jackson County, Alabama, was outdated and not working properly due to increased flows. Space and soil limitations would not allow for a conventional replacement.

Solution: Mark McCurdy of McCurdy Engineering and Surveying chose **Presby Environmental's AES system.** The system consisted of two 1,000-gallon concrete septic tanks and one 1,000-gallon pump tank. The site had a slope of approximately 5 percent. Due to shallow soil restrictions, it was determined that the absorption bed would be sloped. The effluent was pumped to a distribution box that fed two serial sections (300 feet each) in a sand bed of 22 by 92 feet, totaling 2,024 square feet for a 1,000 gpd system. This was figured using a .714 application rate. The system was intentionally oversized, as there was no space for a reserve area.

Result: Approximately 30 installers, engineers and environmentalists worked together to complete the system, and Great Expectation Ministries was able to keep its doors open. This project was organized as training and a way for industry professionals to obtain continuing education credits. **800/473-5298**; www.presbyeco.com. ■

INDUSTRY NEWS

Hino Trucks expands INSIGHT platform

Hino Trucks expanded its INSIGHT platform to fit across all 2017 models. The platform includes three services — INSIGHT Telematics, INSIGHT Remote Diagnostics and INSIGHT Case Management — to deliver real-time data

GPS Insight recognized for rapid growth

GPS Insight ranked No. 431 on Deloitte's Technology Fast 500, a ranking of the 500 fastest-growing technology, media, telecommunications, life sciences and energy tech companies in North America. The company was also ranked the 40th largest and 21st fastest-growing company in Arizona at the *Phoenix Business Journal's* Arizona Corporate Excellence (ACE) Awards. ■



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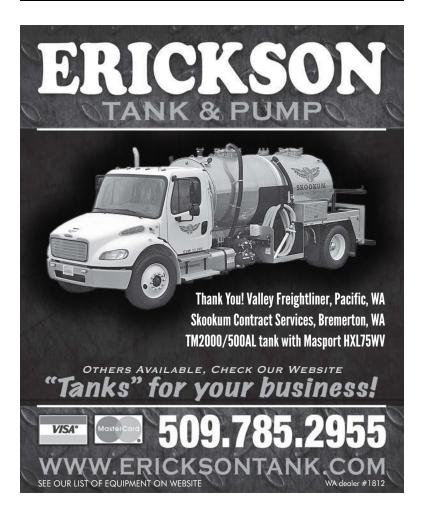
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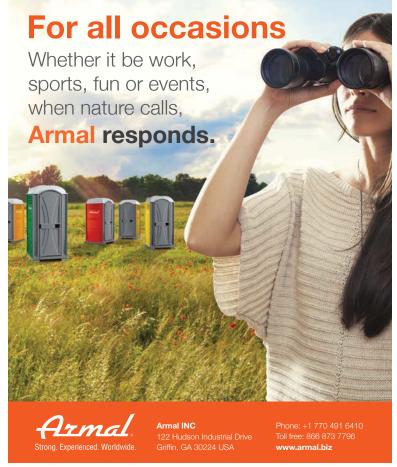
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The **HTV 573** PTO-driven hydrovac truck from **Vac-Tron Equipment** provides contractors with a midsized option.

"There are guys out there that we're finding who are buying bigger trucks only because they haven't really had another option, whereas now they can buy a midrange truck that is PTO-driven," says Brian Showley, vice president of sales at Vac-Tron.

"This series fits a niche, where you don't need that big truck, or you can't afford it, but you can do the same types of jobs at a smaller scale," he says. "It's more maneuverable, and it can get into spots where the big trucks can't. It's better for city streets and downtown areas — those areas are very congested."

The PTO-driven systems are available on Ford or Freightliner chassis. Debris tank options range from 300 gallons up to 1,500 gallons. The truck's PTO drives positive displacement vacuum blowers that produce 1,000 to 3,000 cfm.

The truck can be used in industrial vacuum applications as well as for air and hydroexcavation. The truck can be fitted with a smaller hose reel and jetter pump for cleaning out laterals, lift stations and sewage.

Standard equipment includes a high-pressure water system, full hydraulic rear door and reverse pressure. The unit also features Vac-Tron's Big Red filter housing that cleans air down to 0.5 microns before it passes through the air pump. Air compressors and 4- to 6-inch hydraulic booms are available on most units. **888/822-8766; www.vactron.com.**



MUNCIE POWER PRODUCTS PTO AND INSTALLATION KIT

The HS24 power takeoff and installation kit from Muncie Power Products, in partnership with Hino Trucks and Allison Transmission, features modifications to accommodate Hino's 338

Series of trucks and Allison 3000 Series transmissions. A sculptured housing enables the power takeoff to clear obstructions for easy mounting on the Hino chassis. A smaller overall housing enables the power takeoff to be mounted on other 10-bolt applications. The PTO has a drop-in shift solenoid and clutch shift design with torque ratings from 325 ft-lbs. 800/367-7867; www.munciepower.com.

DITCH WITCH RT80 RIDE-ON TRENCHER

The midrange RT80 ride-on trencher from Ditch Witch is powered by a 74.5 hp turbocharged Deutz Tier 4 diesel engine. A compact de-



sign and axle capacity give the trencher a static load rating of 39,000 pounds. Features include a tight turning radius; three-speed, shift-on-the-fly ground drive controls; and a standard cruise control system that automatically adjusts to changing load conditions. An LCD color display shows engine information and diagnostics. 800/654-6481; www.ditchwitch.com.



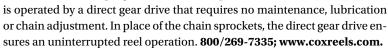
CLERAL ONBOARD WEIGHING SYSTEM

The SIM (Suspension Intelligent Management) onboard weighing system from Cleral USA features an embedded computerized load equalizer for tandem and tridem suspensions. The system assesses the weight on each axle and divides it equally by controlling air pressure of the pneumatic auxiliary axle. The auxiliary lift axle is managed by the SIM control, which will raise or lower the pressure of the axle in accordance to the legal load limits. It

can be used on both straight-body units and tractor/trailer pairings with either the Reflex (outside mount) or Kiload K2 (cab mounted). **866/901-7372**; www.cleral-usa.com.

COXREELS MOTORIZED HOSE REEL

The 1125 Series of motorized hose reels from COXREELS features a one-piece, all-welded A-frame base as well as a low-profile outlet riser and an open drum slot design that provides for a non-crimping, smooth hose wrap. The reel



SNAP-ON DRIVE

Williams Flextensions drive extensions from Snap-on Industrial Brands are designed for hand and power tool use by technicians who work with engine and heavy-equipment manufacturing, assembly and repair. Features include a black oxide finish, TIGwelded socket retention pin providing full rotation power to the socket, a 7/32-inch cross hole and bevel drive end. The ex-

tensions are available in a variety of SAE and metric socket sizes and extension lengths, in both 1/2-inch and 3/8-inch square drives. 800/446-7404; www.snaponindustrialbrands.com. ■



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2009 Peterbilt 388, Cat 410 HP, jake, 8LL spd, 20# fronts, full locking rears, 2012 yr model J&J steel 4800 gallon vac tank, RCF Fruitland 500 vac pump, alum. hose trays, heated valves, very clean, ready to work
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2007 Freightliner M-2, Cat 210 HP,6 spd, AC, low miles, NON CDL, NEW 1850 gallon steel vac tank, NEW Jurop PN-84 vac pump
Call For Pricing!
2-YEAR 100,000 MILE
DRIVE TRAIN WARRANTY



2007 Freightliner M-2, Cat 210 HP, 6 spd, AC, low miles, NEW 2300 gallon steel vac tank, NEW Jurop PN-84 vac pump
Call For Pricing!
2-YEAR 100,000 MILE
DRIVE TRAIN WARRANTY



NEW 2015 Dodge 5500, Cummins 325 HP, auto, NEW 1250 gallon portable toilet tank, NEW Jurop PN-33 Vac pump. \$78.500



2009 Sterling LT-9513, Cat 350 HP, jake, 10 spd, 20# lb fronts, double framed, full lockers, **NEW** 4200 gallon alum. vac tank, **NEW** Masport 400 Vac pump.

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2011 Western Star, Detroit 475 HP, jake, 8LL spd, 20# fronts, full locking rears, 4700 gallon Pik Rite Steel vac tank, NVE 866 liquid cooled vac pump, alum. hose trays, heated valves, pressure washer system, 65 gallons fresh water, very nice truck, ready to work.

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2008 Kenworth T-300, Paccar 260 HP, Allison Auto, low miles, **NEW** 2300 gallon steel vac tank,

NEW Jurop PN-84 vac pump.
Call For Pricing!

2-YEAR 100,000 MILE DRIVE TRAIN WARRANTY



2005 International 7600, Cummins 385 HP, low miles, jakes, 10 spd, 20# fronts, NEW 3300 gallon steel vac tank, +250 gallon fresh water tank, full hoist, full open rear door, NEW NVE 866 liquid cooled pump 500 CFM

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DRIVE TRAIN WARRANTY



2007 Freightliner M-2, Cat 250 HP, 9 spd, AC, NEW 2500 gallon alum. vac tank, NEW R-260 Jurop Razor Pak.

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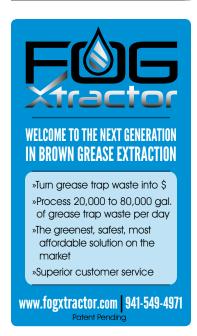
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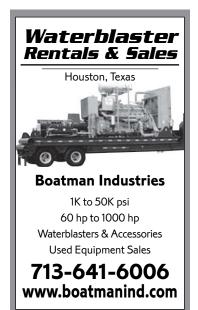








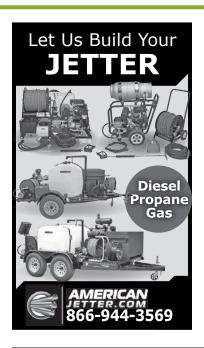


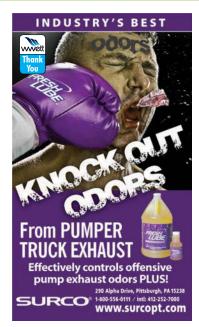














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BUSINESSES

Roto-Rooter franchise for sale in Northeast AZ. Navajo and south Apache Counties. In business 27 years, owner wants to retire. Qualified buyers only, will carry paper with large down. Turnkey business, three vans, pump truck, John Deere backhoe and a lot more. 928-537-3123 (P05)

Septic Pumping Business: St. Paul, MN, SE Metro/3-County service area. Established 1960, excellent name recognition. 1991 International 2,500-gallon pumper with 2010 LMT tank; 1991 International 3,400-gallon pumper with 1998 Jay's tank. 3,000-customer Quick-Books database. \$110,000. Serious inquires only. Call Bob 612-730-5870. (P05)

Retiring from an established, family-owned, full-service septic pump company in western Colorado. Large, loyal customer base. Turnkey with website, client list, trucks and lots of tools. Proven good income. Serious inquiries only please. E-mail eagleseptic@qwestoffice.net (P03)

Portable toilet company for sale in south Florida. www.expressportable.com for information. Please send all requests to info@expressportable.com or Juan 786-488-4276. (P04)

Fully-equipped Long Island, NY cesspool cleaning company for sale. Established 50+ years serving Nassau & Suffolk Counties with excellent reputation and high-repeat customer base. 516-993-0446 (P03)

Septic tank & drain cleaning business, 45 years established, Ft. Lauderdale area, state licensed. (2) vac trucks, (2) vans, (2) water jets, Spartan drain-cleaning equipment. Call Bob 954-214-8293, City Sewer Cleaners, Inc. (P04)

Trade my toilet business for restroom trailers. 2015 sales for toilets were \$200,000 - no trucks in trade. 300 toilets in this trade. Located in Boston area. toiletsforsale123@ gmail.com (P03)

Septic pumping business for sale in western Wisconsin. Solid customer base. 28 years serving the public. Enough work for two trucks and LOTS of opportunity to expand! Two trucks, spare pumps, tools, rooter. Truck, tank and pump parts plus assorted equipment. Serious inquiries only. No brokers. \$125,000 for all. 715-755-2905 (Steve) or tjcb1954@yahoo.com (P04)

Portable toilet business for sale in Illinois. 80 regular units, 6 ADA-regulated units, 1 outside sink station, 3 inside sink stations. Established 10+ years. \$175,000. Contact Steve at surecleanportables@gmail.com or 815-685-0555. (P03)

Mr. Rooter Franchise for sale in New Jersey. In business for one year. 1st year sales \$500K. Financing available for qualified buyers, Can be purchased with our without inventory and equipment. 609-503-9944 (P03)

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

Septic Service Business for Sale with On-site Stabilization Plant -- Northeast FL. 20,000-gallon lime stabilization plant is one of only three septage stabilization plants located in NE Florida. Owner wishes to retire. Callahan area is north of Jacksonville, a fast-growing area in Florida. Profitable, turnkey business. 30 years in business with loyal customer base. Two pump tuck operation: (1) 1996 International 4900: DT466, 5-speed transmission, 2-speed axle. 2,500-gallon capacity. 298,000 miles. Good tires, excellent condition. (2) 2000 Freightliner FL70: 8.3 Cummins, 6-speed transmission. 2,400-gallon capacity. 197,000 miles. Good tires, excellent condition. Owner will train and assist with licensing. Call for more information. Kenny Farmer 904-879-4701 or 904-545-0357.

Portable toilet rentals in Berks County, Pennsylvania, established 21+ years. Gross sales \$130,000+. Price \$250,000. Employees: Owner/Operator. Excellent turn-key business opportunity that has grown 30% in the last year, more than 100% in the last 15 years. Steady customer base. Business includes all contracts, 150 portable toilets/sinks, 2 service/delivery trucks, and an 8-unit delivery trailer. Owner can assist with training and transition if requested. Neither vehicles, equipment, or customer list will be sold separately. Call Rick at 610-927-9114 or email itspottytime@comcast.net

Northeast Arizona. Elk & mule deer hunting. Septic pumping business for sale - \$265,000. House and 1.3 acres available - \$119,000. Turnkey and established over 29 years. Owner retiring. Call 401-741-5501. (P03)

Well-established SW Florida portable restroom business for sale. 800+ units on the street, 15 ADA, 30+ sinks, 20+ holding tanks, 6 trucks, 2 trailers. Many long-term construction customers. Year-round event customers. Documented yearly growth. Only serious buyers need to inquire. portapottyrentals@yahoo.com (P03)

Septic tank cleaning & inspection service business for sale in Central Maine. Owner is branching out after 20 years and wants to sell this part of the business. Profitable, turnkey business with a loyal customer base. Two pump-truck operation (1) 2000 GMC - 2,500-gallon capacity, 136,000 miles. (2) 2004 Peterbilt — 4,500-gallon capacity, 129,000 miles. Serious inquiries only! \$257,000. Call 207-782-1620 or email septicbizsale@gmail.com (PBM)

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530-832-0370

P03



Tom 423-240-9737, GA



Two used RTS 1000 Rotary Screens:

530-832-0370, CA

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

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

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1996 Ford with a Presvac 3,500-gallon, carbon steel, DOT vacuum tank with a Masport pump. (Stock# 1829V) www.Vacuum Salesinc.com (888) VAC-UNIT (822-8648)

1990 Presvac 5,500-gallon stainless steel vacuum tank trailer with a Presvac PV750 vacuum pressure pump and engine package. (Stock# 5006V) www.VacuumSalesInc. com (888) VAC-UNIT (822-8648) (PBM)

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2016 Western Star 4900SA Tri-Drive Chassis, Detroit DD16 15.6L (560hp) diesel engine, Eaton-Fuller RTLO-18918B 18-speed transmission, jake brake, locking differentials, air-ride suspension, 20,000# fronts and 69,000# rear axles, aluminum wheels, 300-inch wheelbase, (2) 100-gallon fuel tanks. Rebel Hurricane hydrovac. For more information call Great Lakes Equipment Sales

888-744-5487 or email P03 info@usedvacuumtrucks.com

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800-213-3272, www.hotjetusa.com

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US Jet 18gpm, 4,000psi. 300-gallon tank, 380 hrs. Dump gun and nozzle included. Great machine - Ready to make money! \$15.425. Contact Tim 832-473-7222 (P03)

2014 Harben 4018 DSK 300P with 2014 trailer. 14' aluminum insulated & heated with aluminum floors. Wireless remote. Machine hardly used. \$60K new. \$45,000. 609-503-9944 (P03)



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1993 GMC 1-ton Jetter: 35gpm FMC pump, 3/4" hose, 500-gallon plastic tank.\$11,900 0B0 Other jet trucks and trailers available.

608-835-7767, WI PBM

JET VACS



Call John 503-887-0070 PBM



289-339-1366. ON

P04

2003 Clean-Earth Safejet-1015 on International chassis, 116,118 miles. 10-cubic-yard debris, 1,500-gallon water. Roots 27"Hg blower (2,975hrs), 84gpm @ 2,000psi water pump, 1" rodder hose, sludge pump. \$75,000. qarth.loen@pcq.com 901-377-3289 (P05)



Call Mark 423-421-4347, TN PO3



Contact Jim 717-989-2222, PA office@jgenvironmental.net P04

One (1) 2015 Freightliner Camel combo vac truck and one (1) Western Star combo vac truck. Both equipped with 824 blowers, ejector plates, 12-yd. debris tanks, 80gpm at 2,000psi water system, 1.500-gallon fresh water and 600' of 1" jet hose. Low hours and miles. Partial factory warranty. For pictures, pricing and more info, call Jeff 317-258-4900 (P03)

2012 Peterbilt 365 Tri-axle with a Presvac Powervac 3800, 3,250 U.S. gallons, carbon-steel vacuum tanker, Dump type high with a Hibon PD blower 3,800 SCFM with vacuum to 27" of mercury, DOT 407/412. (Stock#9220C) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648)

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

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

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100 Olympic units for sale. Plastic and fiberglass, orange & white. Needs some repairs. Send offers to joshuaperez@portoco.com (P03)

25-50 each PolyJohn & Satellite event units \$100 each firm. Various grades contractor units free for pickup. John 804-752-2599 (P03)

100+ Maxim 3000 and Tufways for sale. Good construction units. Tufways are light blue and are \$175 each. Maxims are grey and are \$225 each. Pickup location is Little Rock, AR. Call Scott at 501-514-1231 or Bubba at 501-519-2409 (P03)

100+ toilets for sale. Older units, suitable for construction use. Mixture of Tuff Jons, PolyJohns and PolyPortables. Priced from \$75-\$125, in lots exceeding 10 units. Two free units, of like kind purchased, included for free with each group of 10. Located in Lexington, KY. 859-255-6605 (P05)

300 PolyJohn PJN3 portable toilets for sale. Located in South and West Texas. Purple in color. Ranging from 1-3 years old. \$250 each. Package pricing available on orders of 50 or more. If interested give me a call 903-746-1213 (P03)

Olympic fiberglass flush units w/sinks, urinals and soap & paper towel dispensers. Good condition. \$225 each. 203-748-6906

PORTABLE RESTROOM TANKS

12-volt washdown pump and hose. Many fittings and 2" hose. New SDS6 with valve and electric start. Call/text 218-296-1091

PORTABLE RESTROOM TRAILERS



2011 Ameri-Can Restroom Trailer: 3 compartments - 1 womens, 3 mens, 1 shower. Great shape, barely used.

Call or text 814-592-8719, PA P03

(2) 2015 Rich restroom trailers, (1) 12 ft. max unit. 1 men and 1 women, heat, air, hot water, stereo, TVs. \$22,500. (1) 16 ft. Alpine unit two women's stalls, one men's stall with two uninals, heat, air, hot water, stereo, also has the winter package. \$33,000. Units are brand new. Hardly used. These units are loaded. Call 828-708-3519 (P03)

NEW Commercial grade durable restroom & shower trailers. Direct connect to utilities. 1-10 stations. Starting at \$8,000. Call for details 800-680-2902 ext. 103 (P04)

2007 Olympic Trailer: (6) ladies stalls and (2) sinks, (2) mens stalls, (4) urinals and (2) sinks. Heat, a/c and hot water, \$15,000. Olympic trailer (4) ladies stalls and (2) sinks, (1) mens stall, (3) urinals and (1) sink. Heat, a/c and hot water, \$15,000. Call 845-883-7880. (P04)

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

PORTABLE RESTROOM TRUCKS

Princess II 1,500-gallon on 2016 Hino 268A. 160cfm air-cooled, 45psi @ 7gpm water system. \$103,318. Contact Heather 228-832-0992 or hodo.heather@keithhuber.com



901-452-7040, TN



517-546-2268, MI



2002 Ford F450: 7.3, auto, 199,000 miles, 600 waste/ 250 fresh approx. Honda motor, 2009 Jurup vac/blow, Leeson water pump, toilet rack. \$18,000

717-530-9741, PA



1997 Chevrolet 3500: 600 waste/200 fresh. New Conde pump. Nice truck!\$8,250

317-892-2476, IN

P03

Portable toilet septic truck: 1999 International 4700, rebuilt 7.3 PowerStroke, rebuilt 5-speed manual, new clutch. 2004 Best Enterprises GH1500 stainless service unit (1,100 waste/400 fresh), Conde SDS12 vacuum, pressure washer, toilet carrier, storage bins, dual side toilet service, 3" septic service, 4" discharge. Truck is ready to work. \$21,595. Will separate. Photos available. 918-658-3974 (P03)



2008 Ford F750 with stainless steel Coleman tank with hydraulic pump 1,000/400. CAT Diesel, Allison transmission. 114k. Under CDL. \$29,900

pflynn@superiorportables.com P03



2008 Ford F750: Best stainless steel 1,100/400 tank. 6.2L Cummins, Allison automatic. Under CDL. Conde Pump. 229k. Ready to run routes. \$29,900

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1999 Isuzu: 175 horsepower Isuzu diesel. Only 3,250 miles! Auto, a/c, 900 wastewater/300 freshwater, PTO-driven Coleman vacuum pump. Vacuum and water access from both sides. Highoutput water pump. Great portable toilet truck in excellent condition! \$22,500

740-259-5555, OH

P03



2007 International 4200 VT365: Non-CDL, Portable toilet septic truck with new injectors, engine ECM and brakes. Equipped with Progress aluminum tank (1,500-gallon waste/500-gallon fresh), Masport pump and toilet carrier. Service is dual sided with 3" suctions, equipment bins and hose racks. 4" septic discharge. Truck is ready for work! \$49,000

Call 931-363-5379, TN

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Almost-New Trucks for Sale: 2015 Ford F-550 6.7 diesel/auto with 1,100gallon Crescent tank, 27,000 miles, \$69,000. 2014 Ford F-550 6.7 diesel/ auto with 1,100-gallon Crescent tank, 53,334 miles, \$64,000. 2012 Ford F-550 6.7 diesel/auto with 1,100-gallon Crescent tank, 99,130 miles, \$52,000. 2011 Ford F550, 1,100-gallon Crescent tank, 107,000 miles, \$49,000. For additional photos, contact

> Mike 216-990-6658 tom@arisrentals.com

P04

2008 Isuzu NPR HD: Crescent tank 550 waste/250 fresh. 6-unit carrier. 108k miles. Well-maintained truck. Dual-service, Masport pump w/flush kit. \$45,000. 203-748-6906 (P03)

2004 UD 2600 w/1,000-gallon tank, Masport pump. Pumps and runs great! All six tires 98%. 196k. \$28,000 OBO. Email grasongillespie@gmail.com

Two (2) portable toilet trucks available: 2007 Chevrolets C5500, Duramax, Allison, 1,500-gallon aluminum tank by Progress (400 fresh/1,100 waste) Masport HXL4DE, twounit hauler, wash-down pump, new rubber. 313.500 and 286.000 miles. Well maintained. \$19,000 and \$21,000. For pictures contact info@dakotaportabletoilets.com

2002 Hino FB1817 Cab-Over pre-emissions. 85,000 pampered miles, 17,600 GVW, 700-gallon waste/250-gallon fresh, Masport HXL4V auto-oiler pump. 2-place toilet carrier. Runs strong and has a solid tank. Great for getting in and out of tight spots. This is a must-see truck. Delivery to the lower 48 states possible. Terry 734-654-8855 (P03)

2002 Hino FB1817 cab-over pre-emissions. 85,000 pampered miles, 17,600 GVW. 700-gallon waste/250-gallon fresh, Masport HXL4V auto-oiler pump, 2-place toilet carrier. Runs strong and has a solid tank. Great for getting in and out of tight spots. This is a must-see truck. Delivery to the lower 48 states possible. Terry 734-654-8855 (P03)

2007 Isuzu NPR/HD Work Mate Jr. from FMI. 300 waste/150 water, 6 - 8 unit toilet carrier. Thieman liftgate. 139.690 miles. DOT INSPECTED, South West District Health IN-SPECTED. Maintenance records available. \$37,000. Please contact Jason or Marcus at 208-467-0089 (P07)



Complete Portable Toilet service truck mount units (turn-key), mounted on your truck or ours. Tool boxes, dual work stations, dc10 washdown pump, reversible vacuum pump, hose reel, set up complete, toilet racks available. 1100 waste/400 fresh: \$21,000, 1700 waste/600 fresh: \$23.500. Anv custom options or sizes available!

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2000 Sterling, 312,460 miles, 300 freshwater/700 waste, Masport pump, under CDL. Automatic, air brakes, lift gate. Hauls 8 portables. \$15,000. 517-546-2268 (P03)

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)

2009 Ford F550: 4x4, diesel, auto., new 950-gallon 650/300 aluminum tank, Conde SDS6, 115cfm Honda 9hp electric start. www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PBM)

2006 GMC: Duramax diesel, Allison auto. New aluminum tank 400 waste/200 water, Conde pump, Honda motor. www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PBM)

PORTABLE SHOWER TRAILERS

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

POSITIONS AVAILABLE

Rapidly-expanding South Jersey/Philadelphia area portable restroom company is looking for an experienced Operations Manager/ Salesperson. Call 856-207-5449 or send resume to mrobinson@robinsonwaste.com (P04)

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

PUMPS



2014 Godwin CD500M, Dri-Prime, 6.5hrs, 24" x 18" suction/discharge, 16,120gpm, CAT C18, PrimeGuard controller. \$110,000

Call Jeep 619-933-6639, CA or itharp@tcincsd.com

NEW Jurop LC420 vacuum/pressure pump: Brand new Jurop LC420 vacuum/pressure pump with full manufacturer warranty, 425 cfm free air, liquid cooled. \$3,100. Call or text 734-309-2093 (P03)

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

RENTAL EQUIPMENT

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

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ROLL-OFF TANKS



New 4.000-gallon roll-off tank with new Fruitland hydraulic-drive pump. Use with any roll-off truck. Ready for work.\$36,500

KLM Companies 617-909-9044

PBM

ROLL-OFF TRAILERS

2001 ESP Roll-off trailer: Two (2) container roll-off trailer good brakes, tires, frame. etc. KLM Companies 617-909-9044 (PBM)

SEPTIC TANK FORMS

Shaddix 1,000-gallon baffled mold and 1,500-gallon baffled mold. Used but nice. \$15,000. Myron 478-737-1734 for pics and info. (P03)

SEPTIC TRUCKS



BRAND NEW: 3,750-gallon steel tank, with all new pumping components, reconditioned Masport 400cfm, mounted on a 1997 International 4900 - 52,000 GVW. DT466; 9-speed manual. 269,492 miles. Tires 90+%. Asking \$49,999 OBO

612-559-3456, MN



gallon tank. 290,000 miles, CAT C12, stainless hose trays and heated collars. Truck is in great shape, works everyday.\$55,000

716-676-3388. NY

SEPTIC TRUCKS



1998 Freightliner: 382,000 miles, M11 Cummins motor, Rockwell 10-speed transmission with new clutch. New 3,200-gallon tank - never used. Masport 400 liquid-cooled pump. Tires & brakes 98%. Ready to go to work. \$50,000

Call 763-213-8235



1996 Freightliner FL70: Cummins, 6-speed, 223,530 miles, 2,400-gallon waste, 200-gallon aluminum freshwater, DC10 pump, hitch receiver. \$30,000

717-530-9741, PA



2005 Peterbilt 379: Complete CAT rebuild of C-13 with 2-year warranty. 110 bbl. tank with Fruitland pump. 18-speed, 18,000 lbs. fronts, 13,500 lbs. lift, 46,000 lbs. rears. 550,000 miles. Asking \$54,000

607-769-4380, NY



2012 Peterbilt 388: 110 bbl. tank with Fruitland pump. 230,000 miles. 500hp Cummins ISX, 18-speed, 20,000 lbs. fronts, 20,000 lbs. lift, 46,000 lbs. rears. Asking \$89,000

607-769-4380, NY



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

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



2004 International 4200 SBA: White, 26,000 GVW. 1,500-gallon steel tank, Masport, 4" gate. 272,780 gentle miles.\$40,000 OBO

360-913-0133, WA greenworksofwa@gmail.com P03



2006 International Eagle: 3206 CAT with a 2008 Dragon 5,460-gallon tanker, Masport pump. 275,000 miles. Ready to go to work.

> 814-592-8719, PA P03



Several trucks for sale: 2009 Peterbilt 4,300-gallon; 2015 Peterbilt 4,200-gallon; 2014 International 2,800-gallon; 2012 International 2,800-gallon. All have jetters. Call for info and pricing.

318-797-2702, LA



2012 International DT 4400 Maxx-Force 270hp septic truck with 2,500-gal-Ion Amthor Matador aluminum vacuum tank, Masport H15W vacuum pump. Allison 3500 6-speed automatic transmission. Air-ride suspension. New tires and rear brakes. Excellent condition, runs great! AC, AM/FM radio, 156,000 highway miles. \$78,500

Call Jeff 760-749-3600, CA PO4 or email abell.jeff@gmail.com



1995 Mack CL713: 350hp, 8LL Eaton transmission. 2007 1/4" carbon-steel 3,600-gallon tank. Stainless steel chip guard and hose trays. Moro 350cfm vane pump. Aluminum side boxes. 290.000 miles, 27,300 hours. Well-maintained and garage kept. For more information and pictures call or text:

920-960-6625. WI buckmaster_clark@yahoo.com



2007 Kenworth: 3,600-gallon aluminum Progress tank, 300hp, 10-speed, 332,000 miles, Challenger pump, jetter system. \$77,500

832-777-7540, TX

2001 Freightliner FL106: Septic/grease pumping truck. Detroit diesel engine, 3,000-gallon tank, 255,000 miles. Asking \$45,000. Call 740-751-8376.

Wanted to Buy: Septic truck w/ full lift and full-opening rear door, 3,200 - 4,000 gallon. Late model in excellent condition. Contact D.J. 575-526-5442. (P03)



2006 Sterling: Mercedes engine. air suspension, Mid-State 3,600-gallon aluminum tank, Jurop vac pump, heated valves. Fleet-serviced truck still in use daily. Asking \$65,000

Call or text 330-442-8070, OH PO3 rexking@kingsanitaryservice.com



2004 Freightliner: Air suspension, new tires, c15 6NZ engine (big power) 18-speed transmission, 4,600-gallon Tiger tank, NVE vac pump. Truck is still in use daily. New truck on order! Can deliver to the WWETT Show Asking \$60,000

Call or text 330-442-8070. OH PO3 rexking@kingsanitarvservice.com



2003 Sterling Acterra: Mercedes diesel with Allison automatic transmission. Keith Huber 2,600-gallon tank. 466k miles. Must sell! New truck is on the way. \$19,980 OBO

Call Peter 727-386-0070, FL P03



1995 International 8100: International diesel, 2,800-gallon tank, lots new parts, great condition. Needs nothing. \$18,000 OBO

Call 518-791-8476, NY

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2004 Freightliner 5,400-gallon septic truck. Fresh rebuild, Masport pump, ready for work. Great shape. ...\$59,000

Call/text 814-592-8719, PA P03



2001 Freightliner: 6-speed manual, 2,500-gallon tank w/rear dump, heated valves, Battioni 8000 vacuum pump. Ready for work. \$35,000 OBO

724-837-6084, PA



740-820-5520. OH

1995 Freightliner FLD120: 235,000 miles, 370 Cummins N14, 10-speed transmission, 4,200-gallon tank with 460 Challenger pump. 6" dump, 4" intake. New hose trays. 603-387-0210 (P04)

2000 Peterbilt Model 377 tri-axle, C-12 CAT motor, jake brake, 10-speed. 4,500-gallon steel tank. Jurop LC-420. \$45,000 OBO. Call 715-546-2070. (P03)

1993 GMC TopKick: Mostly cosmetic damage, engine-tires are good and can be used for parts, automatic, diesel. \$6,000. 559-474-0688. Madera, California (P03)



2001 GMC T6500: 3126 CAT engine, 214,000 miles, auto transmission, a/c. Non-CDL. New: 2,000-gallon tank (300 freshwater, 1,700 wastewater - Can make 2,000 wastewater if preferred) and NVE Challenger 607 vacuum pump. Also New: Tires, paint and aluminum wheels. Great running and driving truck. \$29,000

740-820-5520, OH



Call 850-398-7722, FL



Call 563-927-5823, IA



Herm1029@gmail.com 402-578-5200, NE



1999 Mack CH613 with 455,000 miles for sale. 10-speed, 350hp, 3,500-gallon tank, NVE pump, air ride. Truck clean in and out. Ready to work....\$30,000 OBO

Call Steve 973-252-8400, NJ PO3 shunkele@accuratewaste.com



517-546-2268, MI



Call 850-944-5536, FL P03



507-273-1999, MN

P03

1996 Ford F-700: 428ci, auto, 72k miles, 4,500 hrs., power steering, air brakes, Wallenstein 403 pump with new vanes. \$15,000 OBO. 203-217-9601 (P03)

2000 Sterling pump truck: 575,000 miles, 3,250-gallon tank, R260 Jurop pump, C-12 CAT, 10-speed. Excellent condition, used daily. \$30,000. Call for pictures. Kevin 303-882-1986 (P05)



607-769-4380, NY

P03



2013 Dodge 4500 with 40,000 miles. One owner. Brand new 2016 model 1,600-gallon tank - never been used. Jurop pump with jetter. \$90,000

Text/call Jerry 918-381-9072, OK



912-424-2784, GA

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, CO. (PBM)

1995 Freightliner: Detroit Series 60, Fuller 13-speed, 3,365-gallon vac tank, Masport pump. www.pumpertrucksales.com. Call JR. @ 720-253-8014. CO. (PBM)

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)

P03

SEPTIC TRUCKS



2012 International 4300 MaxxForce septic truck with 2,500-gallon Progressive aluminum vacuum tank, Masport 350cfm vacuum pump. General brand 3,000psi Jetter with 250 ft. of 5/8 Piranha hose. 6-speed manual transmission. 130,000 miles. The engine needs to be replaced, everything else is in excellent condition. Get a deal at \$44,000. Or if we replace engine - \$70,000.

Billy 770-365-2566, GA



1995 Mack CL713 septic truck, 4,000-gallon tank. Good shape - runs every day. \$39,000

Call or text 814-592-8719, PA PO4



2003 Sterling Acterra: Mercedes diesel with Allison automatic transmission. Keith Huber 2,600-gallon tank. 466k miles. \$27,450 OBO

Peter 727-386-0070, FL

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.

2005 Ford F750 XLT: 5.9 Cummins, 245hp, 7-speed, 122,500 miles, under CDL. New 1,850-gallon vacuum tank, new Patriot 300 vacuum pump. www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO. (PBM)

2003 International 4300: DT 466 new inframe overhaul; Allison auto., 136k miles, used 1,200-gallon steel vac tank, under CDL; PV3 vac pump, www.pumpertrucksales.com. Call JR. @ 720-253-8014, CO.

2008 Ford F750: 260 Cummins. 7-speed. rear locking differential. New 2.500-gallon vac tank, new Jurup pump. www.pumpertrucksales.com. Call JR. @ 720-253-8014. CO. (PBM)

Eight great older pump trucks - \$35,000 each. Big power. Jake brakes. 3,365-gallon vacuum tanks, Masport pumps. All makes & models. www.pumper-truck.com. Call JR @ 720-253-8014, CO. (PBM)

2006 Kenworth T800 quad-axle cab & chassis with a 2001 Somerset 4,500 U.S. gallon, full-opening rear door, vacuum tank and Robushci Series 65 vacuum blower. (Stock# 8893C) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)

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)

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)

2009 Peterbilt 340 with a 3.600-gallon aluminum tank and Masport HXL400WV pump. (Stock#8401V) www.VacuumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)

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. (PBM)

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, (PBM)

SERVICE/REPAIR

Dynamic Repairs - Inspection Camera Repairs: 48 hour turn-around time. General Wire, Ratech, Ridgid, Electric Eel, Gator Cams, Insight Vision, Vision Intruders. Quality service on all brands. Rental equipment available. For more info call Jack at 973-478-0893. Lodi, New Jersey. (PBM)

SLIDE-IN UNITS

2013 600-gallon KeeVac slide-in style vacuum system with 175 feet of 2" Tiger Tail suction hose. Complete unit. \$11.000. 714-401-7480

SLUDGE APPLICATORS

1986 Field Gymmy Truck: Blue, 427 automatic. 2,000-gallon stainless steel tank, newer Moro pump. Floater tires. Extra set of new tires. 1976 GMC parts truck included. Good shape. \$15,000. 802-477-2716, VT

1988 2004 Ag Chemical Terra Gator: Yellow. 2,200-gallon tank, Moro pump. Factory-rebuilt 519 Cummins motor - 200 hours. New clutch, 10-speed Road Ranger transmission, injectors, floater tires. Good shape. \$32,500. 802-477-2716, VT

TANKS



100 - 2011 Wichita 500 bbl. (21,400 gallons) portable frac tanks. Epoxy lined. Delivery available.

Call 815-341-0375 PBM or email tsgeneva@hotmail.com



1995 Top Air 15' steel vacuum tank. 3,200 gallons. New 24" manway. Ready for paint! \$8,000

Call 207-227-4205, ME caston lovely32@hotmail.com



3,000-gallon aluminum tank for sale. Send offers to

joshuaperez@portoco.com PBM



Presvac 110 barrel (4620 gal). Included with the tank is a 400cfm liquidcooled Masport vac pump along with the right angle gear box and PTO shaft. The tank has all the primary and secondary shut offs, heated valve collars, and has a heavy-duty rear bumper w/chain boxes. It's all ready to go, I'm asking \$18,900 for the whole package.

Call 716-474-7013, NY



2011-2012 ITI Stainless Tanks: 105 bbl., 232" length x 76" diameter, 4,615 gallons. 3/16" stainless steel, heated valves, sight glasses. National Vac 4310 pumps included. Approx. 4,800 lbs. \$18,000 each. 30+ available. Also available: 90 bbl. tanks. Delivery available. More photos at www.stanleystruck sales.com Call Stanley's Truck Sales, Dayton, Ohio

> 888-516-3345 or 937-430-4093

PRM

P03



Masport pump, 4,000-gallon tank, 18'6" long, 6'8" wide, 20" rear hatch, 5" rear discharge. Truck not included. \$7,500 OBO

716-685-6757, NY

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)

Two (2) 20,000-gallon lined tanks. 660 bbl. US capacity, 13' x 23', \$15,000 for one, \$25,000 for both. E-mail eagleseptic@ gwestoffice.net (P03)

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2012 4,700-Gallon Pik-Rite vacuum tank: Complete vacuum tank, Masport pump, rear bumper, tool boxes, all lights, epoxy-lined, electronic level gauge. As good as new for half the price! \$28,500. Call, text or email. accuratefabrication@live.com or 734-309-2093 (P03)

4,000-gallon aluminum septic tank. Bought raw aluminum and had it rolled. The tank is tack-welded together with three baffles. External rings, both heads, primary and one manway included. Just needs to be welded and put together. \$6,000 OBO. 508-384-1400 or jasonh@pumperguys.com (P03)

2008 LMT 3,000-gallon carbon steel vacuum tank. (Stock# LMT3000V) www.Vac uumSalesInc.com (888) VAC-UNIT (822-8648) (PBM)

Pre-owned 4,000 U.S. gallon, carbon-steel vacuum tank. (Stock #4000V) www.Vacu-umSalesinc.com (888) VAC-UNIT (822-8648) (PBM)

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)

TOOLS

Crust Busters: Portable, lightweight machine, guaranteed to mix up septic tanks and grease traps! Save time and money! **www.crustbusters.com**, 1-888-878-2296.(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)

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Imperial Vacuum Trailers: In stock, 6000- and 6300-gallon aluminum singlecompartment Imperial vacuum trailers.

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TRUCKS - MISCELLANEOUS



570-954-0831, WV



For more info/pics contact 717-250-1837, PA

P03

2005 International 7400: Auto. transmission, 160,000 miles. 2,800-gallon Pik Rite aluminum tank, Moro pump. Ready for work. \$39,000. 410-294-9520 (P03)

TV INSPECTION

Pearpoint Flexi-coiler p571 mk2 pushrod system (attached monitor) with p455 explosion-proof Twinview Flexiprobe color digital camera - auto-uprighting head. Two available. \$13,200 per unit. 412-384-9327 (P04) Pearpoint explosion-proof inspection system, 2000 Isuzu diesel box truck, 16,374 miles, generator 2,670 hours. Two complete Pearpoint Type 420 tractors with Type 494 heads, P599 cable drum, various size light attachments, one spare 494 head, one remote auxiliary counter wheel, spare wheels, brushes, and parts included in tool box. \$39,000. 412-384-9327 (P04)

VACUUM EQUIPMENT

2011 GapVax HV43: 3,500cfm blower, 9.5-cubic-yard tank, 4 cyclones, 32 bags, hp water pump, lift. 45 hours. Excellent shape! Best reasonable offer. 763-428-4322. (P06)

3" Vacuum Hose: Five (5) 33' hoses with couplers. (Kanaflex 220RS) Used one year. \$400. Firm/cash only. Tom 715-828-2588 (P03)

2015 Berringer PD 3,500-gallon on 2015 Kenworth T800 \$232,929 w/FET. Non-Code, 1,660cfm blower, jetter, lift and dump. Contact Heather 228-832-0992 or hodo.heather@keithhuber.com (P04)

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VACUUM LOADERS



1999 International Guzzler vacuum excavator: Totally refurbished, designed for Big Dig Project. 27" blower, CAT engine, auto remote. Special noisesuppression equipment. Tri-axle. Slurry, gravel, sludge, liquids. High-pressure wash-down system - 300-gallon water tank. Ready to work. \$135,000

617-212-0162, MA



1996 Guzzler Classic vacuum truck Ready to work! 18" blower, wet/dry, Ford L9000. Engine rebuilt in 2015. \$75,000. Other vacuum trucks available; 1999 King Vac chassis and tank only - \$40,000; 1989 Guzzler with SS tank, pony engine rebuilt, ready to work - \$50,000; All three trucks for \$150,000

Call Tom 423-240-9737, TN P04



Lease for \$3,600 or Finance for \$4,000 per month for 60-months. 2015 Peterbilt Model 348 chassis, Paccar PX-9 (350hp) diesel engine, Allison 3000 RDS-P automatic transmission, taper leaf fronts and AirTrac rear suspension with rear locking differentials, 20,000# fronts and 40,000# rears, 60,000 GVW, Alcoa polished aluminum wheels. Brenner tank ASME DOT 407/412 Code 3.200-Gallon carbon-steel vacuum tank. For more information call Great Lakes **Equipment Sales**

888-744-5487 or email info@usedvacuumtrucks.com



1997 Ford Louisville Guzzler vacuum excavator: Totally refurbished, designed for Big Dig Project. 27" blower, CAT engine, auto remote. Special noisesuppression equipment. Tri-axle. Slurry, gravel, sludge, liquids. Ready to work. \$125,000

617-212-0162, MA

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

1995 Mack CL713 Elite with GapVax HV-47 Wet/Dry, 27" air mover, sludge pump. Nice truck - Ready to work. 33k miles, 5,300 blower hours. \$100.000. 814-553-9785 kvle@biglerbovzenviro.com (P03)

WANTED

Wanted to Buy: Septic truck w/ full lift and full-opening rear door. 3,200 - 4,000 gallon. Late model in excellent condition. Contact D.J. 575-526-5442.

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

WATERBLASTING

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)

WATER JETTING EQUIPMENT: We sell, repair and retrofit water blasters. Visit us at: www.waterjettingequipment.com or phone 714-259-7700.

AIR PREHEATER CLEANER EQUIPMENT FOR SALE. Gardner Denver PCT-2000-P. Two complete systems available. Like new, only used twice. \$19,000 each or \$35,000 for both. 903-758-9166

WATER BLASTING PUMPS AND EQUIPMENT FOR SALE....Equipment valued at \$375.000+. Three pumps, NLB 300, JETSTREAM 1012 and 10175. Numerous accessories which include 2D and 3D StoneAge equipment and 10/20 and 30k accessories. Asking \$135,000 as a package deal. Please call Cory for more information. 330-807-1490 (P05)

40,000 psi Sapphire Nozzles, UHP hoses & replacement parts. Excellent quality & prices. 772-286-1218, info@alljetting.com, www. alljetting.com.

Have a short-term or seasonal contract that just doesn't justify the purchase of waterblasting equipment? We've got you covered! Waterblasting units for rent, as well as all of the parts and accessories needed to complete the job. 1,000 hp units with technicians. Call 502-424-0190.

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