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North Carolina's Ward Brothers pays attention to customers' needs and is always willing to tackle new, profitable service offerings PAGE 12

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You're the Teacher

A new study shows Americans use a lot more water at home than they think. Installers can play a vital role by helping customers conserve a resource and enjoy a trouble-free onsite system.

By Jim Kneiszel

If you've tried to explain to customers how many gallons per day of water they consume and were met with a disbelieving stare, then the results of a recent water usage survey will come as no surprise to you.

According to the report, *Perceptions of Water Use*, published by the National Academy of Sciences, most Americans use twice as much water as they think performing household tasks. The study's author, Shahzeen Attari, an assistant professor in the Department of Public and Environmental Affairs at Indiana University, states, "In general, people tend to underestimate water [use] by a large magnitude."

A cross-section of 1,020 U.S. residents was surveyed for the study aimed at finding out what people know about their water-consumption habits. The study was based on a concern about dwindling water supplies and the need to conserve the vital resource. Onsite installers could look at the results as a validation of their efforts to educate homeowners about wasting water and how that impacts the life of an onsite system.

The study shows that when water is plentiful and inexpensive, and overuse doesn't cause significant issues, people are not going to pay much attention to it.

TIME TO TEACH

The study brought to light some interesting consumer trends and challenges moving forward but came to an optimistic conclusion: "Well-designed efforts to improve public understanding of household water use could pay large dividends for behavioral adaptation to temporary or long-term decreases in availability of fresh water," the author states.

The online survey turned up a few interesting facts:

Estimates are way off for high-usage activities.

On average, those surveyed underestimated water usage for a variety of typical household activities. For example, participants thought a standard clothes washer used 14 gallons of water compared to the actual 34 gallons for typical usage. The differences between perceived and actual usage grew when looking at high-use activities, such as running a garden hose or keeping a hot tub full.

According to the study, the best available U.S. Environmental Protection Agency (EPA) data on water usage and appliances is 14 years old, but it remains relevant. Here's how it breaks down overall water usage in the home:

- Toilet: 26.7 percent
- Clothes washer: 21.7 percent
- Shower: 16.8 percent
- Faucet:15.7 percent
- Leaks: 13.7 percent
- Other: 5.3 percent

People think changing habits rather than switching to water-saving devices is the greater solution.

Respondents believe curtailing water use during certain activities makes the biggest impact on conservation. When asked about the single most effective thing they could do to cut down on water usage, 42.6 percent answered taking shorter showers, by far the biggest response. Others included turning off water when doing other activities [not brushing teeth]; turning off water when brushing teeth; doing less laundry or full loads of laundry; and watering the lawn less often.

Shorter showers and lawn watering might be high on the list because people associate those activities erroneously with extreme water use. Because flushing a toilet only takes a few seconds, they might not think of its greater impact on water usage, the study concludes.

The responses conflict with EPA recommendations for slowing the flow of water through the house. Among the least-mentioned conservation actions mentioned by respondents were "buying water-efficient appliances and fixtures" along with "water-efficient toilet" and "flushing less." According to the study, the EPA estimates that retrofitting toilets for efficiency would cause the greatest savings (71 percent) in indoor household water use. The upfront cost associated with replacing inefficient fixtures may be one reason respondents mention that solution less frequently, the study speculates.

Education efforts should target women and young people first.

If you're a parent always harping on teenagers for their long showers, this conclusion makes a lot of sense. The median age of those taking the survey was 30 years old, skewing younger than the U.S. median age of 37.2 years. A few more men (51.6 percent) than women took the survey. The

study determined that older and male participants were more accurate in their perceptions of water usage.

DRAW YOUR OWN CONCLUSIONS

None of this is surprising (with the possible exception that men showed a more realistic perception of water usage). The study shows that when water is plentiful and inexpensive, and overuse doesn't cause significant issues, people are not going to pay much attention to it.

It's the same thing we've experienced with gasoline. Regular was 50 cents per gallon when I was in high school, so it didn't hurt much when I pulled into the pump in my gas-guzzling '68 Chevy Impala with its rumbling 327 V8. But today, Americans look at fuel consumption in a different way. With skyrocketing prices, they have to.

Attari's report cited another study estimating 13.2 gallons of clean water are required per person, per day for human needs, but that the average American was using 98 gallons of water per day in 2005. And 70 percent was used indoors. Clearly there's a disconnect between expectations and reality, and we're needlessly pouring a lot of water down the drain and loading drainfields.

So, like you've known for as long as you've been designing or installing septic systems, most homeowners need a little education about using water efficiently – not just to conserve the resource, but to keep their private wastewater systems working properly. Anything you can do to further that effort helps the environment, saves your customers worry and repairs down the road, and enhances your reputation as a wastewater professional. Class is in session. ☐

Installers provide a valuable and professional service

I would like to take a moment and add my thoughts to the interesting ideas brought up in the May 2014 Editor's Notebook column in *Onsite Installer* magazine.

Jim Kneiszel did a great job summing up the state of blue-collar workers not only in America but especially in our sewer/septic industry. In his article "Getting your hands dirty," Jim discusses how although there is plenty of work available, many companies are having a hard time finding the next generation of young people to work with. He builds on this point by hypothesizing that young people do not want this work because it is both very difficult and very dirty to do. He also states that there is a lack of initiative to really work hard and see a job through to a quality completion. Jim finishes out the article by mentioning that people like his dad (and also my dad, and probably even yours), who want to build things and fix things with their own hands, just no longer exist.

I completely agree. In this article, Jim has perfectly sized up what has happened in America over the last 50 years. Our workforce has dramatically changed. The well-paying jobs of yesterday existed in the trades or on a production line. Unfortunately that just isn't always the case in today's world. Of course it doesn't have to be this way. There is still a need for trades. People still need to use their toilets after all.

So what can we do about this? How can we persuade the next generation of workers to join us in our very dirty and difficult but still rewarding line of work? Can we do anything? At first I said no. But after thinking about it, maybe there is something we can do.

CONSTANT DEMAND

Our industry is not a glamorous one. We will never directly compete with the likes of high-tech industry in Silicon Valley. Nor should we. Why fight our human nature to go after work that is less stressful, less dirty, and potentially more monetarily rewarding with less physical strain.

But this plays to our advantage. As the old expression goes, "If you have lemons make lemonade." We must follow the economics of supply and demand. We have the good fortune to be in an industry that most everyone needs. Running water and working sewer systems are the tenets of our first-world society after all. There will always be a demand for these services.

But take a minute to think into the future. What will happen as fewer young people enter our field? The amount of demand will increase for each of our industry's suppliers. This translates to fewer workers, allowing us to charge more per worker. Expertise does not come cheap, especially as it becomes more rare.

This market movement will finally legitimize our trade to the professional level that it needs to be viewed. People need our services just as much as they need those of a lawyer, sometimes even more! Our market is heading in a profitable direction, and it is up to us to prepare for it. It's just a simple case of economics.

MOVING FORWARD

So how do we prepare to be successful in this future? We obviously can't just start dropping huge price tags on projects or services. We have to start really explaining to the customer what we're going to do and how we're going to do it. We must act and look professional at all times. Our whole operation needs to show professionalism, expertise, and experience to the customer.

We must structure our companies in a way that allows us to make and justify real profits. Not just profits to get by, but profits that allow us to buy new equipment, have a professional operation, and yes, even take nice vacations with our family. And where does all of this start? It starts at the sale. The sales process is where we differentiate our expertise and our skills to our customers.

The sales process is where we make our profit and show our customers why we deserve it. The actual doing of the job is just follow-through. So let's keep improving our sales techniques, and pricing our jobs to make a profit. Our market is ripe for success, whether the younger generation wants to take advantage of it or not! Let's stop complaining and continue becoming more and more successful.

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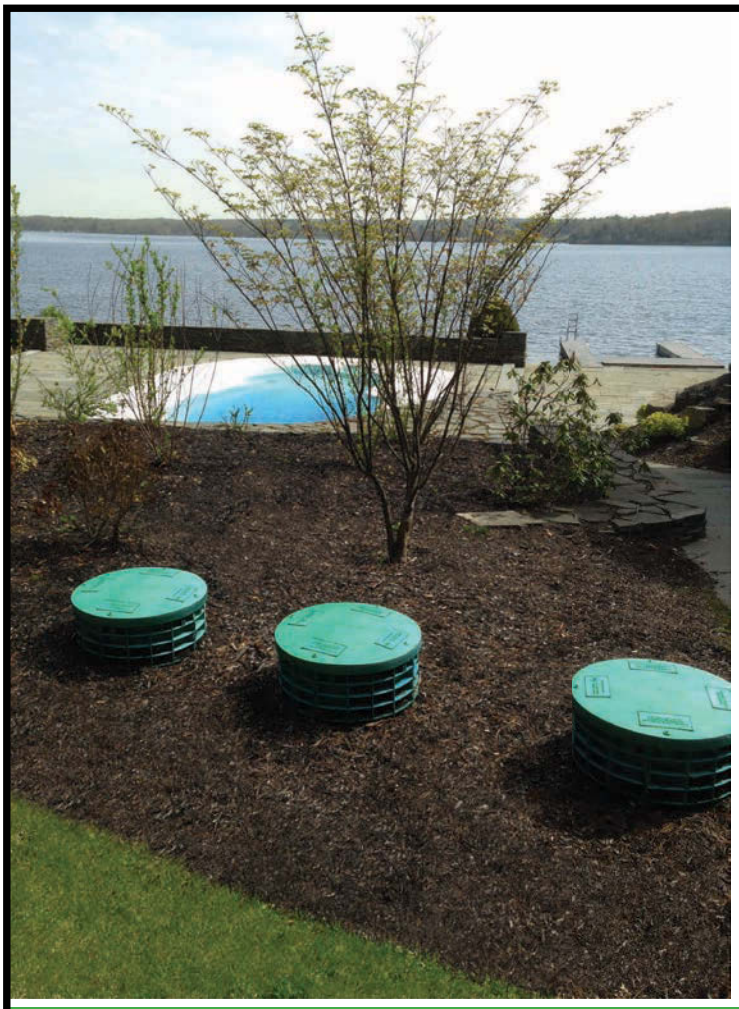

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MAY WE HELP YOU?

North Carolina's Ward Brothers pays attention to customers' needs and is always willing to tackle new, profitable service offerings

By David Steinkraus

A can-do attitude and maintaining flexibility to provide value-added customer service have sustained Ward Brothers LLC through many economic ups and downs. Family company owners Nick and Nathan Ward oversee an experienced, cross-trained crew that has installed septic systems around Greensboro, N.C., for 40 years.

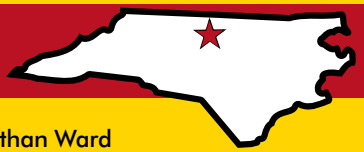
For the most part, Ward Brothers installs traditional septic systems … but don't make the mistake of thinking it ignores advanced technology. Quite the contrary; the old-line contractor is always willing to try new things. If it's in the ground Ward Brothers will maintain it, and that includes systems that use drip irrigation and LPP. The company also does commercial systems.

North Carolina is blessed with good soil structure, which means customers can often rely on the tried and true. That makes for predictably well-functioning septic systems in most cases.

"We see a few engineered systems. In our area of North Carolina we have a lot of good soils," Nick Ward says. "We have so much good soil that unless people have a lake lot, which is harder to find and obviously environmentally sensitive, it's easier and cheaper for buyers to find a piece of property that can accept a conventional septic system."

ABOVE PHOTO: Left to right, technicians Brian Blake and Dwayne Garner and owner Nathan Ward coordinate the installation of a new tank for a Greensboro, N.C., septic system. (Photos by Al Drago)

Ward Brothers LLC
Greensboro, N.C.



OWNERS:	Nick and Nathan Ward
FOUNDED:	1973
EMPLOYEES:	5 full-time and 3 part-time
SERVICE AREA:	15 counties within 90 to 100 miles of Greensboro
SERVICES:	Septic system installation and repair, inspections, pumping, drainage control, grading, hauling, general landscaping
AFFILIATIONS:	North Carolina Septic Tank Association, North Carolina Onsite Wastewater Contractor Inspector Certification Board, North Carolina Water Pollution Control System Operators Certification Commission
WEBSITE:	www.wardbrosllc.com

To learn more about Ward Brothers LLC, check out a video interview at www.onsiteinstaller.com.

Nathan Ward works the controls of one of his company's John Deere backhoes at the start of site prep for a replacement onsite system in North Carolina.

A FAMILY BUSINESS

Ward and his brother Nathan took full control of the company two years ago. Their father Jimmie and uncle Ray started the company by providing system installs. In the 1970s, they expanded into pumping with equipment that would slide on and off a trailer. They poured their own tanks for a while, too, but in the early 1980s sold off all the forms.

Like many others in the industry, this newest generation of Ward brothers started early. "I was on the tractors when I was about 4. I was on the payroll when I was 11. I started learning the business about 12 years ago and managed it for about the last 10 years," says Ward, now 35. He and Nathan, 31, split the management workload. Nick handles sales and scheduling, but both of them try to supervise the installation crews. Occasionally they will work on a big job together, but most of the time they work separately.

The company's workforce is quite stable, Ward says. Equipment operators are dedicated to their jobs, but everyone else has a CDL and does whatever job needs doing. Most have reached the level where they can work independently.

The vacuum service truck is not on the road full time, however. It's a job for rainy days, yet pumping has paid off. "We get a lot of repairs from pumping, meaning people who have failing systems and call us because we have maintained their tanks," Ward says. The company seems to have picked up business from people who have seen its trucks rolling down the road, and many word-of-mouth referrals come to the mature company, he says.

North Carolina does not require pumping at regular intervals. Permits only recommend tanks be pumped every three years, but homeowners have been realizing they cannot ignore their onsite systems.

"In the last five to 10 years, we've done a lot more maintenance pumping. It used to be customers would call only when it was coming up in the yard or backing up in the house. We still get a lot of those," Ward says. In the past, 75 to 80 percent of people ignored septic systems, but that figure made a modest improvement to 60 to 70 percent, in the Wards' estimation.

"I think the real estate market has had something to do with that. Housing is up drastically in price. When you start putting $400,000 or $500,000 into a house, you start paying attention," Ward says.

"In the last five to 10 years, we've done a lot more maintenance pumping . . . I think the real estate market has had something to do with that. Housing is up drastically in price. When you start putting $400,000 or $500,000 into a house, you start paying attention."
Nick Ward

EQUIPMENT CORNER

Ward Brothers likes to use equipment for a long time. For pumping, the company relies on a 1991 Peterbilt with a 3,600-gallon steel tank and Masport pump, and a 1987 Mack with a 2,500-gallon steel tank and an A-C (ITT Goulds Pumps) pump. The Wards built out these trucks.

ABOVE: Technician Brian Blake prepares to pump a septic tank before the Ward Brothers crew installs a new residential onsite system. Note the reminder on the back of the truck for homeowners to pump their tanks every three to five years.
BELOW: Ward Brothers likes to offer pumping service to complement its onsite construction work. Here Brian Blake pulls the lid on a tank being pumped and abandoned to make way for a new septic system.

There are three dump trucks: a 1986 Peterbilt tandem with a Godwin body, a 1985 Peterbilt tri-axle and a 2005 Sterling tri-axle with an Ox body. A 1981 International Road Tractor pulls a dump trailer and a Ferree lowboy. Two 1999 Dodges, a 3500 and a 2500, a 1994 Dodge 2500, and a 1995 International service truck round out the fleet.

In addition there are two John Deere backhoes, a 2012 and a 1997, a 2000 model 864 Bobcat, a 2004 T300 Bobcat, a 2008 T190 Bobcat, and a 2013 T630 skid-steer.

While some contractors trade their trucks every four to five years to avoid costly repairs and the more costly downtime, the Wards have a different philosophy.

"We have fairly new equipment to my way of thinking," Ward says. He and his guys do their own maintenance work during the winter. That includes rebuilding engines when necessary. A couple of his trucks are closing in on 1 million miles. One truck is past that, but it was a long-haul tractor before Ward Brothers picked it up, so it already had 1.2 million miles at the time of purchase.

"We do and don't have time for maintenance," Ward says. What needs to be done is done, yet the company is getting busier as the economy strengthens. Equipment is gradually being updated, yet the key to staying ready for the next job is to keep what you have well-maintained, he says.

STAY FLEXIBLE FOR SUCCESS

For Ward Brothers, a technician's workday could include a simple backyard drainfield replacement or a large-scale $200,000 system for a school. Most engineered systems are for commercial operations. The business split is about 20 to 25 percent commercial and 75 to 80 percent residential. The mix hasn't changed over the years.

"For a long time I ran away from that certification. It's hard to inspect a system and tell somebody they're not going to have any trouble with it because one person may use 300 gallons a day and another 900 gallons."
Nick Ward

In 2009, for example, they installed a 110,000 gpd system for the research and development arm of a company that made peat pots for garden stores. There were more than 20 different tanks and pumps to collect water from the plant, clean it, and then put it back into the plant. That was only a

Technician Brian Blake helps guide the delivery driver from Jamestown Septic Tank during a new system install for Ward Brothers.

temporary facility, and Ward Brothers had more work in 2011 when it took the system out.

For the last several years, trucking aggregate and sand has been a growing service. "I try to do a lot of hauling because we have several dump trucks and drivers, and we can do that work by ourselves," Ward says. "A lot of contractors use us to haul, and we're trying to build that business more."

Ward has discovered the company can be useful to septic system install customers who need additional work done. Perhaps the homeowners need a couple of tons of rock for their driveway. And commercial builders often want Ward Brothers to perform site prep and restoration, as well as final grading and seeding.

Inspections on the rise

Look at the website for Ward Brothers LLC, in Greensboro, N.C., and you will see a label touting the company as state-certified for real estate inspections. This was not a decision made quickly or lightly by the Ward brothers.

"For a long time I ran away from that certification," says co-owner Nick Ward. There was a low demand for the service and he feared complications should an unhappy homebuyer decide to sue. "It's hard to inspect a system and tell somebody they're not going to have any trouble with it because one person may use 300 gallons a day and another 900 gallons."

Ward has seen foreclosed homes with systems that were dry for six months to two years. Sign off on one of those as an inspector and buyers may assume they will have no problems for the next 15 or 20 years and then come after you if something does go wrong, he says.

A spate of foreclosures during the down economy drove increased inspection business and the state's requirement for certified inspectors. Mostly it was the banks, Ward says. They were unwilling to create a mortgage for a home where the septic system had an uncertain status, and they demanded inspections during the foreclosure process. From one or two inquiries a year, Ward Brothers has gone to one or two inspections per week.

One area investment company specializing in flipping properties calls Ward with three or four a month. Nathan's wife, Morgan, works part time as a real estate agent, and her knowledge of that industry has helped the company a great deal, Ward says.

Brian Blake uses a Bobcat excavator to level ground after a septic tank installation.

Ward tries to make a project turnkey for the owner. He will subcontract the plumber and the electrician for the wastewater system, landscape the yard, and subcontract the fencing company. "I saw a niche there, especially for landscaping," Ward says. He thought about the types of calls he received from customers. "I got a lot of callbacks from people who were not happy with their yards settling and from people who didn't know who to call about installing a fence."

Ward estimates the company landscapes about half of the yards for its residential onsite customers. He now includes the service on the project estimate and marks it as optional. Even when homeowners don't opt for that line item initially, they remember the service and call if they are unhappy with their chosen landscape contractor.

CUSTOMER SATISFACTION

Ward doesn't have a long-range business plan. He just wants to help contractors and homeowners make the best decisions about the services and systems they need. He is considering dedicating a technician to septic pumping full-time. Ward says there is a lot of competition for the pumping service, but he concentrates on good service over being a low-cost provider.

"I have a lot of people who call me and don't care what I charge them because they know it will be a fair price," he says.

Success comes down to relationships for this family installing business. Ward wants to strengthen relationships with customers and other area contractors he can utilize when needed. For example, he calls a plumber he knows is dependable, and he will recommend that plumber to others. He realizes it's smart to build a network of goodwill among wastewater professionals … and that attitude is good for his customers. It all comes back to helping customers solve their problems efficiently and reasonably.

At 19, Ward was bossing a crew. Over the dozen years since he has grown up, he's discovered the key to a good business:

"Customers are important, and you have to take care of them," he says. ☐

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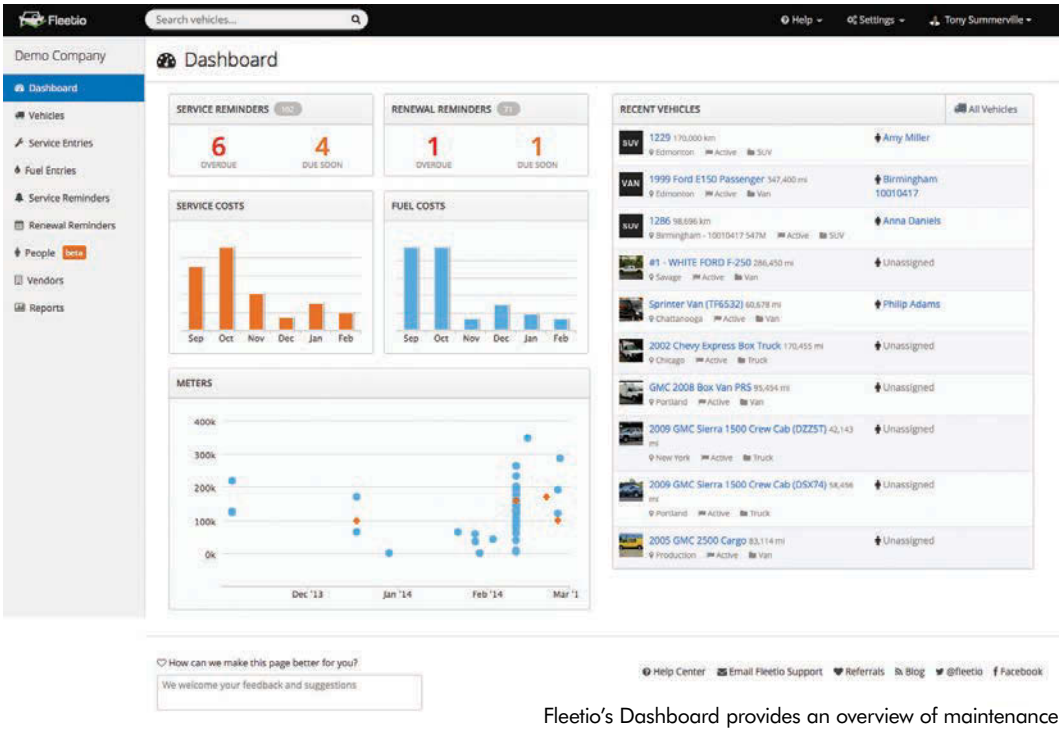

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Is Your Vehicle a Money Pit?

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By Ed Wodalski

The question isn't why you should use vehicle maintenance software, but why not? Sure, you can store data on an Excel spreadsheet, file drawer or even a shoebox, but why would you?

Nathaniel Cochran, director of operations for Dwyer Plumbing, handles dispatching, IT and long-term strategy for the Alexandria, Va., company and its 30 employees. He's also in charge of managing the company's fleet of 28 vehicles that range from service vans to heavy equipment, hydrojetters, compressors and trailers.

"We had been keeping information in Excel, but we really didn't have great records," he says. "It wasn't hard to use, but it didn't put out as much information as the fleet software, like scheduling reminders." Approximately a year ago, Cochran went shopping for a program that would keep tabs on service, fuel mileage and provide preventive maintenance reminders.

The program he chose enables him to share inputting, service and repair data. "I can give a couple other people access so they can update the information themselves, rather than having it cross my desk," he says. "We can pull up the maintenance software from our phones, which helps when I'm doing a physical inspection of the vans – just enter it in from the parking lot."

Cochran says his insurance provider suggested going the maintenance software route. "He said some contractors he works with, the only record they have of their vehicle is the insurance schedule, which is not a particularly good way to know about the condition of your fleet." What Cochran finds most beneficial is knowing which vehicles are costing the most to repair and should be replaced.

CHOICES, CHOICES

Ready for a test drive? A quick online search can display thousands of software options, from free downloads to for-fee upgrades. The challenge is deciding which program best meets your needs and budget.

FleetVIP's free demo tracks two vehicles, while the Standard version ($19.95) tracks up to six vehicles. The Plus version ($49.95) tracks up to 26 vehicles, and the Pro version ($199.95) tracks an unlimited number of vehicles. In each case there is no monthly or annual fee. The for-fee programs are Cloud backup compatible, while the Pro version adds spreadsheet export.

Fleetio offers a 14-day free trial of its programs that range from the free Personal Fleet (one user, five vehicles) to the 1,000-vehicle Epic Fleet ($689 per month or 69 cents per vehicle per month). The for-fee programs allow unlimited users, driver management and provide email support. The Large Fleet (100 vehicles, $119 per month), Super Fleet (250 vehicles, $199 per month) and Mega Fleet (500 vehicles, $359 per month), as well as the Epic Fleet programs, include phone support. All plans include secure data encryption, unlimited file storage and data export.

FleetWise's suite of products start at $100 for the FleetWise Lite package designed for smaller fleets (10 vehicles) to its full-feature flagship FleetWise VB that includes vehicle and equipment information for an unlimited number of vehicles, repair order system, inventory control and fuel management ($700 for stand-alone program without inventory control, $1,350 with inventory, $1,500 for network program without inventory and $2,700 for network program with inventory).

LOOK FOR WEB-BASED PROGRAM

Tom Summerville, founder and CEO for RareStep of Birmingham, Ala., maker of Fleetio, says maintenance programs enable fleet owners to understand the overall cost of owning and maintaining each piece of equipment, from truck engines to vacuum pumps and trailer tires. "All that additional equipment is going to need preventive maintenance and documentation as well," he says. "Even if you have a very small fleet, you still need to be maintaining records and staying on top of the operations of that fleet from a maintenance perspective."

When shopping for a program, look for something that is Web-based and online accessible, he says. It should store all your information in one place, but more important, it should be easy to use.

It also should be mobile. "Having information at your fingertips is a very effective and powerful way to monitor things," Summerville says. And it should seek you out. The system should come to you with notifications – emails and text alerts of what's wrong and needs work.

"Even if you have a very small fleet, you still need to be maintaining records and staying on top of the operations of that fleet from a maintenance perspective."
Tom Summerville

It should be flexible. "You want a system that can adapt to your needs," he says. "You want to track the maintenance of the vehicle separately from the maintenance that occurs on your vacuum pump. If there are unique things that need to be captured at the time of service, having a system that is flexible enough to meet those needs is pretty important."

BETTER DATA

Peter Michaelis, owner of All About Computers in Jacksonville, Fla., maker of FleetWise, says one advantage of a maintenance program over a spreadsheet is data validation. "You might have a column that says *repair order costs*, but there's no checking if the number you put in is correct."

Maintenance programs can perform multiple functions, such as automatically updating parts inventory when entering repair costs. Could the same be done on a spreadsheet? Certainly, says Michaelis, but you would have to go to the repair order spreadsheet and put in the cost, then go to the inventory spreadsheet and subtract your part. It's not as efficient, he says. "The general rule of computer systems is if you have to do something twice, then the chance of it being wrong is twice as great."

Jim Anderson, Ph.D., and David Gustafson, P.E., are connected with the University of Minnesota onsite wastewater treatment education program. David is extension onsite sewage treatment educator. Jim is former director of the university's Water Resources Center and is now an emeritus professor, as well as education program coordinator for the National Association of Wastewater Technicians. Readers are welcome to submit questions or article suggestions to Jim and David. Write to ander045@umn.edu.

Spokes In a Wheel

Every onsite professional should have a basic understanding of the entire system design process

By Jim Anderson and David Gustafson

One of the principles established by our colleague Roger Machmeier at the University of Minnesota was that no matter what role you played in the onsite industry, everyone should take part in the same education programming, covering all aspects of the systems.

The premise – and we believe it was a good one – was that having all professionals represented at the same sessions made the workshop content better and more important. Whether participants were state or local government officials, site evaluators, designers, inspectors, installers or service providers, having a variety of perspectives made for a better understanding of the problems that each group faced. This better understanding carried over into the field and the result was better and longer-lasting systems.

It is important that people working in all areas start out with a basic understanding of how each part of the system is supposed to operate, how to tell if there is a problem, and what can be done to solve it.

This model worked well in Minnesota for a number of years. However, there was always a certain amount of resistance from individuals – particularly on design issues where math and calculations were involved. We experienced even more pushback when we took our workshops using this philosophy to other states. The response went something like this: "I only have to know *this* because someone else is responsible for *that*. And besides, the state or local government does not allow me to perform *that* role." Depending on your own context, you can fill in the blanks for what *this* and *that* referred to.

SPECIALIZATION RULES

In two decades, numerous changes in our industry have made it virtually impossible for professionals in all segments to take part in all training programs or workshops. Think of all the new technologies that require very specialized training for installation, operation and maintenance. There is much more emphasis on evaluating landscape position and soil characteristics that require specialized training in describing soils. The list can go on and on.

So it is probably not realistic that everyone know every detail about each function. On the other hand, it is important that people working in all areas start out with a basic understanding of how each part of the system is supposed to operate, how to tell if there is a problem, and what can be done to solve it.

It is not appropriate for an inspector to say to a designer or installer, "I will not allow you to put the system in that way because I have not seen it before, and I do not know how it works." If the installer or designer has had specific training, they need to share that with the inspector and come to an agreement about moving forward. Likewise, an installer should not be able to hide behind, "I only put systems in according to the design plans, and it is not my fault that the soils were not identified correctly and the system failed."

This is why we have recently worked with the National Association of Wastewater Technicians (NAWT) to develop a course that addresses the principles of design outside the context of specific state codes. It looks at design work from the standpoint of what is needed, how each element of design affects the choice of a system for the site, and how the user (homeowner) impacts whether this is the right system for long-term use.

The idea was to do for design what we did for installation years ago, boiling it down to the KISS, KINN, KILL and KIDD principles. If you have forgotten what those acronyms stand for, remember that you can come up with a creative word to match the last letter to help get your point across. KISS is Keep It Shallow _____; KINN is Keep It Natural ____; KILL is Keep It Level _____; and KIDD is Keep It Dry _____.

KNOW-HOW

This workshop developed with NAWT combines classroom presentations with field exercises in each of the *need-to-know* categories for design. We submit the following *know* principles for consideration. In the next few issues we will look closer at these areas and discuss what we feel are solid design principles that everyone can follow and understand.

1. **Know the permit requirements:** If you do not know the rules to begin with, there will be problems with the permitting authority.

2. **Know the risk involved:** Is the area a nitrogen management area? Are there environmental or health risks associated with the site?

3. **Know the user:** How they use the system designed can impact whether it is a success or failure.

4. **Know the soil:** Most system failures can be traced to misidentification or misapplication of soil characteristics.

5. **Know the collection method:** How does the sewage get where it is supposed to go?

6. **Know the delivery to the soil:** Does it get to the soil by gravity? By pressure? How?

7. **Know what it takes to care for the system:** What are the operation and maintenance requirements? How does that tie back to the risk factor?

LET'S DISCUSS

Hopefully we have set the stage for discussions around each of these basic principles. If you feel we have missed some principles along the way, please feel free to share them with us.

Workers backfill around the observation port on the second trench. The photo shows the steep site and the new house under construction. (Photos courtesy of Greg Guthrie)

Divide and Conquer

An innovative onsite design, custom combo tank and low-profile trench drainfield enable construction of a home on a lot considered unbuildable

By Scottie Dayton

A couple in Lakemont, Ga., wanted to build a two-bedroom summer home on a lake lot considered unbuildable. The consulting engineer recommended Gravelator Systems, a company in Talmo, Ga., specializing in designing and installing systems for such sites.

The biggest problem was a road splitting the 0.35-acre parcel in half, according to Gravelator's owner, Harold Kilgore. "The lakeside portion had a 50 percent grade, and the forested section above the road sloped 40 to 50 percent. Nobody knew how to make the house and onsite system with primary and recovery drainfields fit on one of the halves."

Kilgore broke the problem into small pieces then tied them back together, but his solution perplexed regulatory officials. Steve James, Rabun County Environmental Health Department manager and onsite inspector, was adamant the design would work if Gravelator installed and maintained the system. Nevertheless, 18 months passed before everyone accepted the idea.

"Steve and I have worked together for five years," says Kilgore. "He's an integral part in getting proposed plans permitted because other departments rely heavily on his expertise and judgment. Without his support, our client would not have his house."

"The installation was even more difficult than I had anticipated. Consequently, we did a designated amount of work each day and when it was done, we quit."
Harold Kilgore

SITE CONDITIONS

Soils are evard (sandy loam, forested) with an acceptance rate of 0.45 gpd per square foot. Seasonal high water table and depth to bedrock are more than 90 inches.

ABOVE: Workers from Gravelator Systems hand-deliver Eljen treatment modules for placement in the first drainfield trench.
BELOW: Building a road alongside the bottom trench enabled Harold Kilgore to evenly distribute sand and topsoil, minimizing the amount of manual labor to level them.

SYSTEM PROFILE

Location:	Lakemont, Ga.
Facility served:	Two-bedroom home
Designer/Installer:	Harold Kilgore, Gravelator Systems, Talmo, Ga.
Site conditions:	Evard soil with acceptance rate of 0.45 gpd per square foot; seasonal high water table and depth to bedrock more than 90 inches
Type of system:	GSF sand filter system from Eljen Corp.
Hydraulic capacity:	300 gpd

SYSTEM COMPONENTS

Major components of the 300 gpd system are:

- 564-gallon pump station with duplex Liberty 2 hp sewage grinder pumps. Precast products from Nix Septic Tank Co.
- Dedicated backup power generator
- 1,500-gallon custom lowboy combination concrete septic tank
- Zabel 1804 effluent filter (Polylok)
- Liberty 1/2 hp FL50 effluent pump
- 21 A-42 GSF sand filter modules (Eljen Corporation)
- 30 Quick4 Equalizer 36 chambers (Infiltrator Systems)
- Installer Friendly Series control panels (SJE-Rhombus)

SYSTEM OPERATION

The on-demand pump station – a 4-foot-diameter 6-foot-deep manhole in the basement – sends 75 gallons per dose through 100 feet of 1.25-inch Schedule 80 PVC force main to the septic tank with 1,000-gallon baffled area and 500-gallon pump compartment. On demand, the effluent pump runs 1.7 minutes, sending 60 gallons per dose through 120 feet of 1.5-inch

ABOVE: Steve James (left), Rabun County Environmental Health Department manager and onsite inspector, confers with installer Harold Kilgore (center) on the job site. Kilgore worked closely with James during the process.
BELOW: Ray Matchen, president of Nix Septic Tank Co., and Harold Kilgore unload the custom 1,500-gallon lowboy combination septic tank.

force main to the distribution box, which doses three 36-inch by 34-foot-long trenches in series. (The recovery drainfield has two 24-inch by 60-foot trenches, each with 15 22- by 53- by 12-inch-high chambers.)

Trenches in the primary drainfield have seven 24- by 48- by 7-inch-high treatment modules topped by a 4-inch PVC pipe with left and right alternating half-inch holes every 12 inches. Effluent drips through them and onto the modules, each with an interwoven plastic corrugated core and 64 square feet of geofabric.

Effluent seeps through the modules into 6 inches of ASTM C-33 washed sand with a long-term acceptance rate twice that of conventional drainfields. "Pretreated effluent and enhanced surface area enable these fields to be up to 50 percent smaller than traditional pipe-and-stone beds," says Kilgore. Effluent discharges to the soil.

INSTALLATION

Kilgore designed the system and grinding station, then the architect drew the house plans around them. To separate the plumbing code from the septic code, Kilgore put the station in the basement. His crew dug the wet well and installed the pumps and control panel, but a plumbing company connected the piping and bored 15 feet under the road with a 3-inch steel casing to house the force main to the septic tank.

General contractor Greg Guthrie subcontracted the design of a structural engineered foundation wall and slab to be erected across the road. It would retain the hill after it was cut to create the parking area. Meanwhile, Kilgore hired Appalachian Survey Group to establish the highway department's right-of-way, the septic tank's 5-foot setback from it and the wall's location. "We needed pinpoint accuracy because we had no rattle room," he says.

After a contractor graded the area, workers set the forms for the 14-inch-thick reinforced wall, 5-foot-wide base and six 12-inch-long buttresses. The 5,000 psi concrete cured in 15 days; then the slab was backfilled. The work took four weeks.

A wet spring delayed further progress for four months. Kilgore, concerned he would encounter shallow rock if excavating to the depth of standard tanks and wanting the smallest footprint possible, collaborated with Ray Matchen, president of Nix Septic Tank Co., on a new tank design. After the state approved the 6.5- by 12-foot-long lowboy combo tank, Nix cast it, waterproofing the exterior with tar and the interior with Damtite (a division of Wall Firma) ready-mix latex. "We didn't want any stormwater runoff interfering with the system," says Kilgore.

When the soil dried out, Kilgore closed one lane of the narrow, winding road and stationed flaggers with radios at both ends to control traffic.

Signs and cones created a safe zone for workers. "Dealing with traffic and coordinating the arrival and departure of delivery trucks was stressful," he says. "Drivers had to back the last 500 feet to the closed lane because the road wasn't wide enough for them to turn around." A worker walking behind the trucks helped guide the drivers.

Kilgore used a Bobcat E45 excavator to dig the 8- by 14- by 6-foot-deep hole for the tank, which Matchen delivered and set. Bedding wasn't necessary because the foundation was firm.

That afternoon, Kilgore mounted his Bobcat 331 mini-excavator and cut a road up the 45-degree slope beside the wall, then terraced the hill for the first drainfield trench. He pushed over trees, cleared the underbrush and stripped off 6 inches of topsoil. "The 331 works better on steep slopes because it is narrower and not as top heavy as the E45," he says.

Drivers backing up the road delivered three truckloads (10 cubic yards) of sand the next day, piling it in the work zone. "The hardest parts about installing the drainfields were dealing with the slope and getting material up it," says Kilgore.

As Kilgore dug the bottom, or first trench, he stockpiled the spoil downhill then flatted it into a road to bring up sand. Bedding each trench required 20 or more trips up and down the hill but enabled Kilgore to distribute sand and topsoil evenly, minimizing the amount of manual labor required to level them. Trenches are 10 feet on center.

Workers carried modules up the hill, set them, laid the distribution pipe on top, wrapped the assembly in geotextile fabric, backfilled to the top with 7 inches of sand and walked it in. Each trench took a day to install. Kilgore designated chambers for the recovery drainfield because the slope became even steeper higher up the hill, making it too risky to transport sand or gravel.

"The installation was even more difficult than I had anticipated," says Kilgore. "Consequently, we did a designated amount of work each day and when it was done, we quit." Excessive heat and humidity also taxed the crew.

The success of the system enabled the couple to change their summer home into a full-time residence.

MAINTENANCE

Gravelator Systems is on call for three years should the customer need assistance with the onsite system. There is no maintenance contract.

MORE INFO:

Bobcat Corporate
866/823-7898
www.bobcat.com

Damtite Waterproofing
724/258-7175
www.damtitewaterproofing.com

Eljen Corporation
800/444-1359
www.eljen.com
(See ad page 7)

Infiltrator Systems, Inc.
800/221-4436
www.infiltratorsystems.com
(See ad page 3)

Liberty Pumps
800/543-2550
www.libertypumps.com
(See ad page 9)

Polylok
877/765-9565
www.polylok.com
(See ad page 40)

SJE-Rhombus
888/342-5753
www.sjerhombus.com
(See ad page 21)

ABOUT THE AUTHOR
Eric Casey is executive director of the National Onsite Wastewater Recycling Association. NOWRA represents all aspects of the onsite/decentralized industry. More information can be found by visiting www.nowra.org.

Capitol Hill Lobbying Firm Will Advance Industry Goals

By Eric Casey

The National Onsite Wastewater Recycling Association (NOWRA) has selected Arnall Golden Gregory LLP (AGG) to represent its interests on Capitol Hill and at the U.S. Environmental Protection Agency (EPA) and other regulatory agencies.

While several members of that firm will contribute to the effort, Thomas Cassidy will be NOWRA's lead lobbyist. Cassidy has considerable experience representing the water and wastewater industry before Congress and the EPA. Over his more than 30-year career, Cassidy has worked as a staffer on Capitol Hill, a lobbyist for several Washington, D.C., law firms, and in various government relations roles in the private sector, including for large companies in the wastewater industry.

"We are thrilled to have someone with Tom Cassidy's background leading our effort. His vast network of contacts in our industry and his track record of success for his clients should serve us well," says NOWRA President Tom Fritts.

NOWRA's lobbying efforts will be directed by a Board of Governors consisting of NOWRA's Executive Committee, the chairs of its Government Relations and Business Benefit Program committees (respectively, Robert Himschoot of Crews Environmental and Carl Thompson of Infiltrator Systems), and major donors to the lobbying effort. The Board of Governors will work directly with AGG and will make all policy and strategy recommendations.

At press time, confirmed donors to the effort included: SJE-Rhombus, Norweco, Jet Inc., Kansas Small Flows Association, Infiltrator and Advanced Drainage Systems, Crews Environmental and Septic Systems Express. A number of additional companies have indicated they, too, plan to join the effort.

The goals of the lobbying push are:

- Increase the market share of new construction where onsite/decentralized treatment is used from 30 to 35 percent.
- Increase federal funding support for the onsite/decentralized industry for infrastructure repair and other important needs.
- Influence the EPA to establish more policies favoring onsite/decentralized systems.

NOWRA's lobbying effort is expected to be a long-term, regular activity of the association going forward. Successful lobbying operations require patience and a long-term view. Education of stakeholders will be critical. It is remarkable how little knowledge there is on Capitol Hill, and even at the EPA, about onsite/decentralized wastewater treatment and its benefits. If we want to be taken seriously – and we do – we need to be constantly educating and re-educating Congress and the regulators about our business.

We have a terrific story to tell. Onsite and decentralized wastewater treatment represents more than a quarter of our nation's permanent wastewater infrastructure. It is a sustainable, environmentally friendly technology; it can be constructed and operated less expensively than central sewer in most instances; it protects public health; and it uses the same treatment technologies as publicly owned sewage treatment facilities. It is often the only viable treatment choice in rural communities, but it also works well in suburban and urban areas.

As public utilities grapple with huge infrastructure repair and replacement issues in the next several decades, onsite/decentralized technologies can be deployed in a variety of ways that cost-effectively deal with capacity constraints and the need to serve new customers not located near public sewers. More and more utilities are embracing a distributed infrastructure approach, and we are ideally suited to help them implement that approach.

Hiring AGG is an important step for NOWRA, but it is only one of several activities likely needed for NOWRA's efforts to be successful. The association will also concentrate on additional areas to take advantage of whatever lobbying victories are achieved:

- Develop a grassroots lobbying strategy. It's important to get NOWRA members engaged in communicating with their elected representatives. Money talks in Congress but so do votes. Members will react favorably to personal appeals by their constituents.
- Help state onsite organizations that currently do not lobby at the state level to develop the skills to lobby for changes in state rules and regulations. This will help onsite/decentralized interests to take advantage of any victories at the federal level.
- Development of a broad range of public relations efforts to key stakeholders in Washington, D.C., and those outside of Washington who are involved in the infrastructure decision-making process.

"This is not a sprint; it's a marathon," says Himschoot. "We have a big task ahead of us, but we are confident that we can create beneficial changes in Washington."

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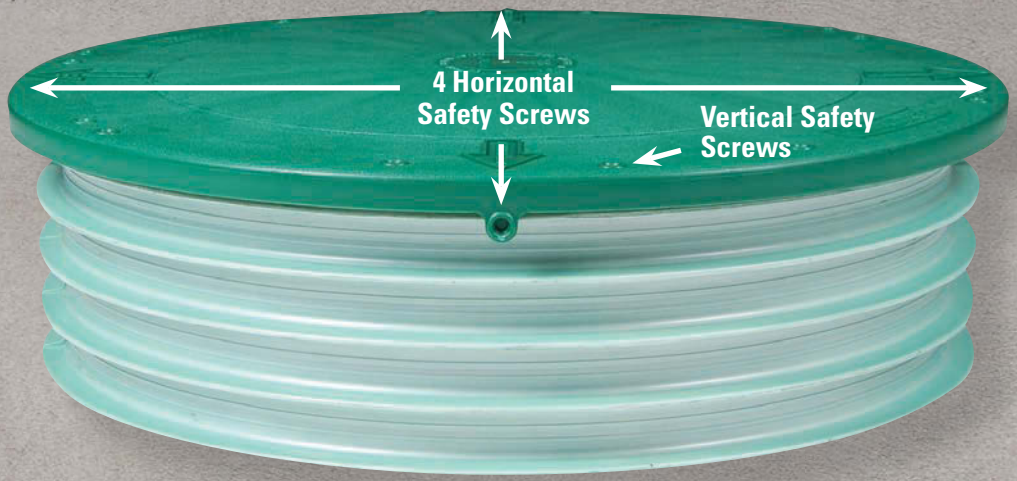

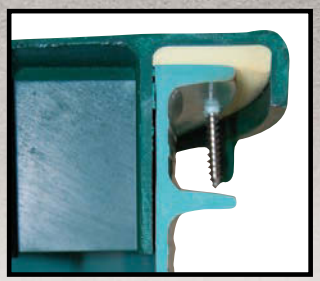

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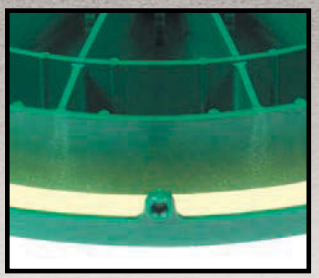

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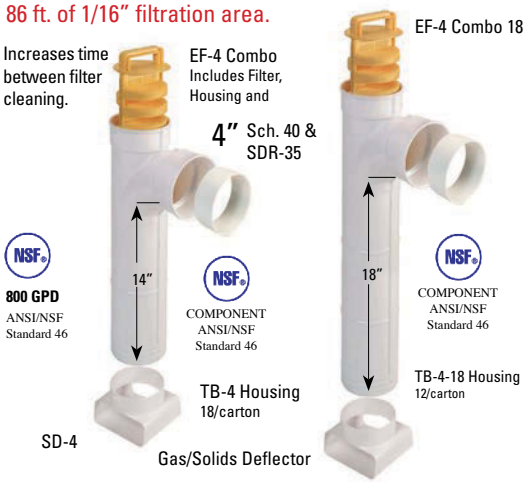

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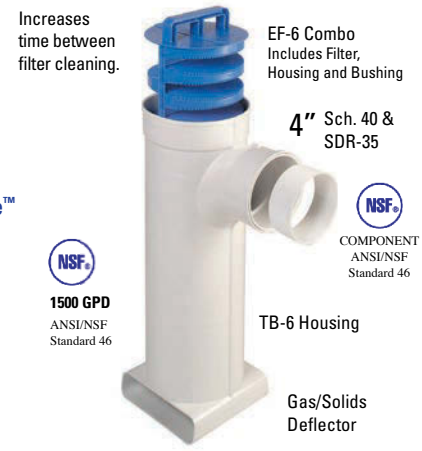

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Stewards of the Environment

A broad spectrum of industry professionals drives the Tennessee Onsite Wastewater Association to advocate for higher-functioning decentralized systems

By Doug Day

The Tennessee Onsite Wastewater Association (TOWA) has a diverse membership that President Bob O'Dette says helps build broad consensus on ways to protect the environment. TOWA's membership consists of installers and pumpers, manufacturers, field practitioners, suppliers, engineers, soil scientists, distributors, research professionals, educators, consultants and regulators. (Learn more about TOWA at www.tnonsite.org.)

O'Dette assumed his TOWA role at the group's annual convention in February. As a regulator of the onsite industry for the Tennessee Division of Water Resources, O'Dette is the state's biosolids coordinator and is involved in the approval of operating permits for large decentralized onsite systems that are common in Tennessee.

Does your job as a regulator get in the way of being the leader of an industry association?

O'Dette: TOWA responds to proposed rules and design criteria by providing comments. We have a relatively large board of directors with 16 members and several of them are regulators. We have a specific position for a regulator along with positions to represent engineers, service providers, academia, soil scientists, installers, manufacturers and training, along with some at-large positions.

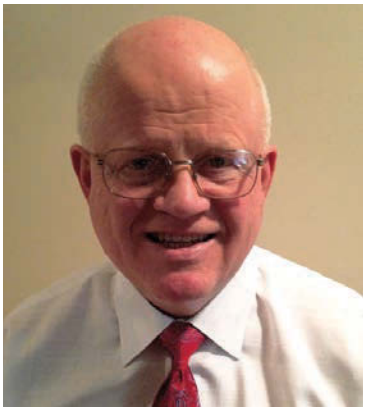
I'm very pleased with the way the Division of Water Resources has been open to getting as much input as they can. We're going to have better rules by getting consensus among a large number of people with a lot of experience. It's a two-way street, and they are very open and transparent with everything they do.

Describe how that works in practice.

O'Dette: We passed state rules for the land application of biosolids in 2013 for the first time. We used to be covered under the federal [U.S. Environmental Protection Agency (EPA)] rule, and still are, but we didn't have state rules. EPA regulations have a specific agronomic rate for septage, for instance, but didn't have one for biosolids.

We've had some issues and wanted to be able to handle it better. It also made sense to have something more customized because we have a lot of differences from the Mississippi River in west Tennessee to the Smokey Mountains of east Tennessee.

Before we put the rules out for public notice and a formal comment period, we had about 15 or 20 meetings across the state and went through probably 30 revisions to the draft rules. Once we put out the public notice, we had very few comments. If we hadn't opened it up and taken the effort to get consensus prior to going into the official rulemaking process, I think it would have been a lot more difficult.



Reach Bob O'Dette at 615/253-5319.

We got the feedback from diverse groups and met with different organizations to give them a chance for input. As regulators, our approach is that you don't keep those things hidden until it's suddenly in a public notice, and people are saying 'What's this?' and don't really have an adequate time to respond. We want a good rule at the end. It may be contrary to what some people may want, but they can understand it because it's been thoroughly aired out.

Part of your regular job is part of the permit process for decentralized cluster onsite systems. Are they popular in Tennessee?

O'Dette: The state has issued more than 400 permits for cluster systems. About 30 or 40 of those are surface spray, the rest are subsurface drip. The typical cluster system in Tennessee serves 150 to 200 homes. We have a couple that have more than 500 homes. We permit some systems that have more than 100 acres of land that is either sprayed or dripped to handle their wastewater.

What is on your radar screen for the onsite industry in Tennessee?

O'Dette: Before the recession, we were in a time of heavy growth and cluster systems were booming. Five or six years ago, we were getting 80 to 100 new applications a year, and then it dropped to almost nothing. I don't think we had two or three new applications last year.

That's not good for the economy, but it allowed us to take a timeout and look at what we had been approving. We needed to rethink some of the criteria that we were allowing, and a number of issues have come up that show that we have to change our thinking a little bit.

One example is that we were allowing 5-foot spacing on driplines and it just wasn't giving us good coverage. We've gone to 2-foot spacing. We know that's more expensive for construction, but it's needed to get good utilization of the soil. I have pictures that show zebra-striping, so it's obvious the nutrients weren't going to the full footprint of the soil area.

We've had just a few cases and only one that balked at the 2-foot spacing. So that's something we're looking at. We'll have a draft and open it up to comments and suggestions. Maybe we can change the criteria, or maybe we'll have to go through formal rulemaking.

"Our approach is that you don't keep those things hidden until it's suddenly in a public notice, and people are saying 'What's this?' and don't really have an adequate time to respond. We want a good rule at the end."

Bob O'Dette

What's the difference between criteria and formal rulemaking?

O'Dette: With criteria, you can make variances and changes without going through the formal rulemaking process. But then you get into the problem of where you draw the line and is it fair to everyone? I think once we see the comments on the dripline spacing and see some more situations, we'll be better able to determine how much of a change we should make.

What about TOWA stands out in your mind?

O'Dette: I've been a member for seven years. I think it's the quality of the people in TOWA and their dedication to doing good work and protecting the environment. There are a lot of challenges out there. I'm very proud to be part of it.

I've been in a lot of organizations. The idea of consensus is so powerful because it's sometimes so difficult to achieve. If you go in and just vote on something, and the people who vote against it don't get their way, there is a tendency to work against it and it will be more difficult and convoluted to get together. With consensus, you and I may not agree that it's exactly what we want, but we can live with it, work with it and support it. And when you get that among a diverse group, you've got something that is very powerful. ◻

Texts to Avoid Trouble

The PitBoss pump alarm system sends text alerts when trouble is on the horizon

By Craig Mandli

Nearly everybody carries a cellphone. With thousands of apps available to download, phones perform everyday functions that weren't even dreamed about a few years ago. Now, thanks to the PitBoss pump alarm system from PumpAlarm.com, the cellphone can also play an integral role in protecting property from water damage.

The PitBoss, featured at the 2014 Pumper & Cleaner Environmental Expo International, does not require a phone line or a home network setup. Instead, installation and setup is as simple as sending one text message to start receiving real-time notifications during a high water event or power outage.

"The technology is actually a spinoff of the industrial pump alarm systems on the market from OmniSite, just condensed down for the residential market," says Andy Wolsiffer, marketing manager for PumpAlarm.com. "This was our second time bringing it to the Expo, and the response has been great."

The PitBoss is activated by visiting the website, plugging it into the nearest outlet, dropping the water sensors where they should detect moisture, and texting the unit up to three phone numbers to send notifications to. It works at any location with a cellular signal, allowing text-based water alarms and power outage alerts on a mobile device.

Casey Hampton, left, business development manager for PumpAlarm.com, discusses the features of his company's PitBoss pump alarm system with an Expo attendee. (Photo by Cory Dellenbach)

"The PitBoss is geared toward residential sump pumps, but it can be used for many other applications too, including low water in aquariums, bilge pump systems in boats, and on septic systems, onsite wastewater treatment systems and holding tanks," says Wolsiffer.

The unit includes two sensors, so water alarm messages can be received from a sump pit, septic system, grinder pump, or even a water heater or utility room drain. In addition, the power outage alarm is ideal for keeping tabs on a property during a vacation, keeping an eye on a business or managing a remote property.

The digital float switch should be hung 3 to 5 inches from the top of the sump pump motor on the discharge pipe using the included mounting straps. Place the water sensors in areas you want to detect water. Each unit has a unique phone number generated during initial unit activation. Program this number into a phone and send messages to it like any other contact. When high water raises the float, a magnet completes the circuit automatically sending out a text alert.

Currently the PitBoss can only be used indoors, but the company is beta testing a weatherproof model that can be installed outside on septic systems and holding tanks. In fact, the 2014 Expo gave Wolsiffer the opportunity to get the prototype into the hands of installers from around the country.

"We probably sent out 10 prototypes of our new model with Expo attendees to test in areas across the country," says Wolsiffer. "We're based in Indiana, so we know the technology will work there. We wanted to get it into the hands of installers in colder and more humid and arid climates, and talking to so many attendees at the Expo allowed us to do just that."

Wolsiffer is looking forward to the 2015 show, now to be known as the Water & Wastewater Equipment, Treatment & Transport Show, or WWETT, to introduce the upgraded outdoor installation-ready alarm system to the market. He says that if it's embraced by the public like the original PitBoss, the PumpAlarm.com booth should be busy.

"The Expo is really the perfect place to hit our target demographic," says Wolsiffer. "It brings in such a diverse group of professionals, and everyone there is enthusiastic and wants to talk about the industry. It's a terrific experience for us." **888/454-5051; www.pumpalarm.com.**

Alarms, Controls and Monitor Systems

By Craig Mandli

Early adoption of valve monitoring technology is effective

Problem: Art Betker, the sewage system operator for the Rockwood Estates residential community in Rice, Minn., realized he was spending a lot of time making periodic checks of the mechanical distributing valves for the treatment modules. The treatment process utilizes 5:1 recirculation, and each valve was cycling over 200,000 times per year. Occasionally a valve spring would break, preventing even distribution to all modules. If the problem was not detected quickly, treatment would deteriorate causing regulatory problems.

Solution: Betker learned about an electronic monitor and early-warning alert system being developed for 6000 Series multi-zone distributing valves sold by K-RAIN, Clarus/Zoeller and Orenco from **Dynamic Monitors**. Betker recommends installing prototype monitors on the four valves during an upgrade. The monitors were hardwired back to the main control panel, equipped with telemetry for remote monitoring.

Result: The monitors have provided early detection of broken valve springs and helped identify an output relay failure in the control panel. A finalized version of the **IVM6000TM** was launched in 2013; however, the prototypes are still working well. "The monitors provide peace of mind that the valves are distributing effluent uniformly and have significantly reduced the amount of time I spend making random spot checks," says Betker. **888/747-7645; www.dynamicmonitors.com.**

Alarms, Controls and Monitor Systems

By Craig Mandli

Advanced treatment units require advanced controls and alarm systems to warn homeowners and installers about potential issues. Here are several alarm systems, controls and monitors that will ensure optimal operation of the most complex systems.

ALARMS

Alarm-equipped effluent filter

The **ML2-920** effluent filter from **Bear Onsite** has dual alarm switch connections, allowing installers the flexibility of choosing the Alderon Industries or SJE-Rhombus vertical reed switch to alert homeowners when filters reach approximately 90 percent capacity and need servicing. Connections are placed on the filtered side of the first screen of the unit, ensuring protection from large, buoyant solids such as toilet paper, vegetable matter or other solids that may adhere to switches and trigger a false alarm. The initial screen consists of two filtration levels – approximately 1/7 and 3/16 inch vertical slots. The final screen of the cartridge provides 125 linear feet of 1/20 inch horizontal slots. **877/653-4583; www.bearonsite.com.**

Filter alarm

The wired indoor/outdoor **3014AB Filter Alarm (Smart Alarm)** from **Polylok** provides audio/visual warning for home or business owners that a septic tank filter needs cleaning. The Smart Alarm Switch activates when the filter cartridge is near capacity (approximately 90 percent full) on solids that have built up through the filtering process. The switch – installed in the filter – sends a signal to the alarm panel, activating the audible and visual alarm alerting the home or business owner that the filter needs servicing. The alarm has a manual test switch and horn silencer; an alarm horn rated at 82 decibels at 10 feet; and 15 feet of cable, with longer lengths available. The switch is designed to fit Polylok, Zabel or Best filters, ensuring proper switch placement. **800/701-3946; www.polylok.com.**

Exterior alarm with pump control

The exterior alarm with pump control from **Septronics** has pump controls located on the right side, with all alarm controls on the left side on a separately wired board. Pump control comes with a hand-off-auto switch. Turn the power to the pump totally off, run the pump manually with the flip of the toggle switch, or put it on automatic to run via the float switch in the tank. Add a receptacle and plug in the pump or hard wire it into the board. Keep the horn silent by flipping a toggle switch to turn off the audible alarm and use as a visual alarm only. **888/565-8908; www.septronicsinc.com.**

Indoor/outdoor high water alarm

The **Observer 500** indoor/outdoor high water alarm from **SPI - Septic Products Inc.** has a NEMA 4X polycarbonate enclosure rated for indoor or outdoor use, 360-degree red alarm light, alarm horn, alarm test and horn silence toggle switch, and a 6-foot 120 VAC power cord. External cord grips allow for easy installation. A mechanical float with a 15-foot cord is included standard, with other cord lengths – as well as mercury floats – also available. **419/282-5933; www.septicproducts.com.**

LEVEL CONTROLS

Intelligent pump control

The **Intelligent Pump Control (IPC) Panel** from **Aquaworx by Infiltrator** is easy to install and leverages pressure transducer technology to monitor multiple types of system events and enhance system performance. The embedded microprocessor and floatless pressure transducer in the pump chamber monitor liquid levels, control pumping time intervals and log events in real time. With the Mountable and Removable Controller (MARC) user interface, installers and service providers can remove the unit for use on multiple IPC Panels and protect panels from tampering. The MARC allows the user to program a panel to address specific system design requirements. The system stores up to 4,000 events and can calculate system flow quantities on a daily basis. **800/221-4436; www.infiltratorsystems.com.**

Timed- or demand-dose control panel

No-Float timed- or demand-dose control panels from **Clarus Environmental** offer a "no float" sensor that detects the liquid level in the tank and sends a signal back to the panel, where it is digitally displayed in inches inside the front cover. The sensor takes the place of up to four floats and has an operating range of up to 40 inches. Pump activation and alarm levels are easily adjusted in the panel. Mechanical float switches can be added for redundant off and high water alarm conditions to provide secondary protection. Panels are available in both simplex and duplex configurations. The simplex panel is easily programmed in the field for use as a timed-dose or demand-dose panel, while the duplex panel is for demand-dose applications only. They have an elapsed-time meter and cycle

counter, audible and visual alarm, auxiliary alarm contact, 115/200/230 volt single-phase models with 7-15 amps, and a UL-listed NEMA 4X enclosure. **800/928-7867; www.clarusenvironmental.com.**

Duplex control system

PDC Series panels from **Liberty Pumps** control the operation of two ProVore residential grinder pumps. The system includes a primary pump control float and an alarm float. LED indicators show power on, pump run status, alarm status and horn enable/disable status. Both pumps are individually protected with a manual reset fuse to isolate a failed pump. They have NEMA 1 indoor-rated enclosures, plug-in-ready wiring, factory-wired floats with quick-disconnect at the box, audible and visual alarms, and 9-volt alarm backup. Receptacles are angled to accept standard or right-angled plugs, and an automatic six-hour run limiter protects against run-dry or runaway pump conditions. **800/543-2550; www.libertypumps.com.**

Pump system control panel

The **4-in-1 Controller** from **Orenco Systems** supports numerous electrical configurations and dosing schedules within a single panel. Both Simplex (MVP-S2DM) and Duplex (MVP-DAX2DM) models are available and can be configured in the field for timed or demand dosing. While the control circuit operates on 120-volt power, the pump circuit is dual-rated for both 120- or 240-volt power, meaning installers and service providers can reduce their panel inventories for new installations and repairs. It includes a programmable logic unit with multiple timing intervals for changing flow conditions, and a built-in elapsed-time meter and counter. It also displays float position and has a float error indicator. Each panel includes a reference chart to assist with troubleshooting during installation and testing, as well as wiring diagrams. It is completely touch-safe. **877/488-3594; www.orenco.com.**

Pump control module

The **Dial-a-Time** control from **See Water** is designed to control pumps with ratings up to 16 full-load amps. The compact, solid-state technology has no moving parts to become tangled, ensuring the proper evacuation of water. This is an ideal control for sump pump basins and any confined-space application that requires consistent liquid-level control. With a limitless pumping range, it can be set to pump from seconds to hours. It has been tested for the frequent cycling of sump pumps and has performed this action over 2 million cycles without failure. **888/733-9283; www.seewaterinc.com.**

Simplex and duplex pump control

Relay Logic Series control panels from **SJE-Rhombus** utilize traditional, user-friendly components for simplex and duplex pump control in water and sewage applications. The simplex panel controls one 120-, 208- or 240-volt single-phase pump in pump chambers, sump pump basins, irrigation systems and lift stations. It has a NEMA 4X-rated indoor/outdoor enclosure with stainless steel lockable hasps, an inner door for added safety, HOA switch for manual pump control, external test/normal/silence switch and a green pump run indicator light. A magnetic motor contactor is used to turn the pump on and off. If an alarm condition occurs, an alarm switch activates the audible/visual alarm. The duplex model provides alternating single-phase pump control with override. Panels are UL/cUL listed. **888/342-5753; www.sjerhombus.com.**

MONITORING DEVICES

Remote management control panel

The **Click+Clean** all-in-one panel from **RH2O North America** allows users to change settings and log data from the home or office, detecting problems before they occur. It has an LCD screen for easy onsite setup, and can be configured to simplex, duplex, or control multiple systems in one panel. It can handle one to eight pumps, blowers or aerators, as well as floats, pressure transducers and flowmeters. Once installed, the panel will make sure all mechanical components continue to work by monitoring current. If a pump fails, a high-level alarm occurs, or the power shuts off, an email will immediately be sent to the service provider notifying them of the problem. **519/648-3475; www.rh2o.com.**

Aerator timer

The **P101FA-2 Timer** from **Septic Services** is designed for shaft-design aerators but can be used for any application that requires mini-breaker (4- to 7-amp) shut-off capability. The 24-hour timer prevents overload on the aerator motor if it becomes obstructed with debris. It is adjustable in 15-minute increments to meet local codes for aerator operating usage, and is designed for both indoor and outdoor use. The durable plastic construction is resistant to wear and temperature extremes. A NEMA type 3R rainproof enclosure provides protection against corrosion. The unit has wiping contacts and zinc-plated screw terminals to resist corrosion and withstand harsh environments. The timer is rated at 120 volt and 20 amp. It has a three-position toggle switch (on/auto, off, continuous), warning light and reset button located on the front. **800/536-5564; www.septicserv.com/store.**

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

States Fight For Shared Chesapeake Bay Cleanup Oversight

By Doug Day and Sharon Verbeten

Pollution limits set by the U.S. Environmental Protection Agency (EPA) aimed at cleaning up the Chesapeake Bay watershed are being fought by 21 states that fear it will result in the federal government taking away power from states to regulate water quality. A lawsuit brought by the American Farm Bureau and other groups was dismissed last September because a lower court ruled in favor of the EPA, six states, and the District of Columbia, which voluntarily agreed to the plans.

The lower court's dismissal has been appealed to the U.S. Court of Appeals in Philadelphia. The 21 states have filed an amicus brief in support of the plaintiffs' challenges of the total maximum daily loads set by the agreement. According to *The Star Democrat* newspaper in Easton, Md., the states claim the limits are "the culmination of [the EPA's] decade-long attempt to control exactly how states achieve federal water quality requirements under the [Clean Water Act], and marks the beginning of the end of meaningful state participation in water pollution regulation." They also claim it would end the "traditional right" of the states to decide how to meet federal requirements.

The states signing the brief are Michigan, Florida, Alabama, Arkansas, Georgia, Indiana, Kansas, Kentucky, Louisiana, Missouri, Nebraska, North Dakota, Oklahoma, South Carolina, South Dakota, Texas, Utah, West Virginia, Wyoming, Montana and Alaska.

FLORIDA

Lawyers have notified the Florida Department of Health that they intend to sue to end the permitting of septic tanks along the 156-mile-long Indian River Lagoon system on the Atlantic Coast. The case is being filed under the Endangered Species Act on behalf of an ecotourism business owner, the Florida manatee, the green sea turtle and the Atlantic salt marsh snake. The suit will claim that septic systems contribute to algae blooms that kill marine life. Excess nitrogen is suspected in the algae blooms, but the source of the nitrogen is not known, according to state officials.

After months of revisions, a bill to protect Florida's freshwater springs passed the first of three committees. SB 1576, introduced by Sen. Charlie Dean (R-Inverness), would provide an estimated $378 million for septic tank hookups and wastewater improvements – considerably more than requested by the governor or recommended by House and Senate budget writers. The House bill has not been before any committees.

Environmental groups, including Sierra Club Florida, supported the changes. Representatives of wastewater utilities, Associated Industries of Florida and the Florida Home Builders Association have concerns about it.

If funding is available, the bill would require septic tank hookups near protected springs to be provided at no cost to homeowners, along with improvements to wastewater treatment plants.

VIRGINIA

The commonwealth Senate has passed a bill that would grant a six-month interim license extension to some septic service operators concerned about their ability to pass a qualifying exam. The bill is on its way to the governor.

The bill is in response to complaints from many in the septic service industry who fear the licensing test will lead to the loss of their businesses. They argue that it is designed for engineers and others with at least a college degree and contains questions that have little bearing on their job requirements.

Critics of the test contend the six-month extension provided for in the legislation doesn't solve their main problem, which is that the test is excessively and needlessly stringent.

The test, administered by a board affiliated with the state Department of Professional and Occupational Regulation, was created for those installing and maintaining sewage disposal systems designed for use in soils deemed unsuited for traditional septic tanks.

IDAHO

The Idaho Department of Environmental Quality is considering changes to guidance covering the design, construction and operation of onsite wastewater systems. The revision to the *Technical Guidance Manual for Individual and Subsurface Sewage Disposal Systems* was put out for public comment in March. The proposals apply to separation distances, drainfield covers and excavation procedures, capping fill trenches, drip distribution systems, experimental systems, extended treatment package systems, pressure distribution, recirculating gravel filters, sand mounds and two-cell infiltrative systems.

industrynews

Grundfos names water utility president


Dieter Sauer

Grundfos named Dieter Sauer president and general manager of its water utility business. Headquartered in Aurora, Ill., he will direct all operations in the division, including the company's new service center.

Optronics releases vehicle lighting catalog

Optronics International released a 2014 lighting product catalog. It is available for download from the company's website, www.optronicsinc.com.

United Rentals completes National Pump acquisition

United Rentals completed the acquisition of National Pump, including 37 branch facilities in the United States and Canada. The $780 million purchase price included $765 million in cash and approximately $15 million in stock.

Thompson Pump names manager of the year


James Copeland

Thompson Pump & Manufacturing Company recognized James Copeland as its 2013 Branch Manager of the Year. Copeland is manager of the Summerville, S.C., branch, which received the President's Award for Excellence in Health & Safety for having no OSHA recordable incidents between 2011 and 2013.

AEM, Ditch Witch produce vacuum excavator safety video

Ditch Witch, a member of the Association of Equipment Manufacturers (AEM) Underground Equipment Manufacturers Council, collaborated with AEM on production of a vacuum excavator safety video. Available through the AEM Store, the video promotes best practices in the operation of vacuum excavation equipment, as well as how to protect underground utilities from damage.

NexTraq named Top 40 Innovative Technology Company

NexTraq, a GPS fleet and asset tracking company, was named by the Technology Association of Georgia as one of its Top 40 Innovative Technology Companies. The award recognizes Georgia-based companies for innovation, financial impact and efforts at spreading awareness of the state's technology initiatives.

If you would like your wastewater trade association added to this list, send contact information to editor@onsiteinstaller.com.

Serving the Industry

Visit your state and provincial trade associations

By Doug Day

Alabama

Alabama Onsite Wastewater Association;
www.aowainfo.org;
334/396-3434

Arizona

Arizona Onsite Wastewater Recycling Association;
www.azowra.org;
928/443-0333

Arkansas

Arkansas Onsite Wastewater Association;
www.arkowa.com

California

California Onsite Wastewater Association;
www.cowa.org;
530/513-6658

Colorado

Colorado Professionals in Onsite Wastewater;
www.cpow.net;
720/626-8989

Connecticut

Connecticut Onsite Wastewater Recycling Association;
www.cowra-online.org;
860/267-1057

Delaware

Delaware On-Site Wastewater Recycling Association;
www.dowra.org

Florida

Florida Onsite Wastewater Association;
www.fowaonsite.com;
321/363-1590

Georgia

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

Georgia F.O.G. Alliance;
www.georgiafog.com

Idaho

Onsite Wastewater Association of Idaho;
www.owaidaho.org;
208/664-2133

Illinois

Onsite Wastewater Professionals of Illinois;
www.owpi.net

Indiana

Indiana Onsite Waste Water Professionals Association;
www.iowpa.org;
317/889-2382

Iowa

Iowa Onsite Waste Water Association;
www.iowwa.com;
515/225-1051

Kansas

Kansas Small Flows Association;
www.ksfa.org;
913/594-1472

Kentucky

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

Maine

Maine Association Of Site Evaluators;
www.mainese.com

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

Maryland

Maryland Onsite Wastewater Professionals Association;
www.mowpa.org;
443/570-2029

Michigan

Michigan Onsite Wastewater Recycling Association;
www.mowra.org

Michigan Septic Tank Association;
www.msta.biz;
989/808-8648

Minnesota

Minnesota Onsite Wastewater Association;
www.mowa-mn.com;
888/810-4178

Missouri

Missouri Smallflows Organization;
www.mosmallflows.org;
417/739-4100

Nebraska

Nebraska On-site Waste Water Association;
www.nowwa.org;
402/476-0162

New Hampshire

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

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

Ohio

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 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

Manitoba

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

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

Ox Bodies Stampede Ultralight dump bodies

Stampede Ultralight Series dump bodies from Ox Bodies are about 20 percent lighter than similarly configured Stampede HD bodies. Applications include sand, small aggregate and asphalt. Bodies are available in 96- and 102-inch widths, side heights of 36 and 46 inches, lengths of 10 to 21 feet and capacities from 6.9 to 19 cubic yards. **800/844-2519; www.oxbodies.com.**

RIDGID XD professional pumps

XD professional pumps from RIDGID feature 360-degree float protection, high-efficiency motor, non-wicking cord to prevent water from entering the motor, and cast-iron body and volute. **800/769-7743; www.ridgid.com.**

Pettibone overhead load handler

The Cary-Lift 154 load handler from Pettibone has a 15,000-pound load capacity and maximum lift height of 14 feet. Powered by a 160 hp Cummins QSB 6.7 Tier 3 diesel engine, the load handler features four-wheel-drive with two-wheel, four-wheel and crab hydraulic power steering modes. The 10-foot wheelbase enables it to turn in a 16-foot-7-inch radius. **800/467-3884; www.gopettibone.com.**

CEAttachments sod unroller

The EDGE sod unroller attachment for skid-steers and track loaders from CEAttachments handles rolls of sod up to 48 inches wide and 60 inches in diameter. **866/232-8224; www.ceattach.com.**

ExakTime Mobile 2.0 for Apple devices

The Mobile 2.0 time tracking app from ExakTime, for all IOS devices including Apple iPhone and iPad products, features Team View, a GPS oversight option that enables a supervisor to view a map showing the clock-in coordinates of all company employees. **877/435-6411; www.exaktime.com.**

Hyundai Construction Equipment backhoe

The H930C backhoe from Hyundai Construction Equipment Americas has an operating weight of 14,881 pounds and is powered by an 87 hp Tier 2 1104C-44T engine. The backhoe has a bucket capacity of 28.3 cubic feet, trenching bucket capacity of 6 feet and digging depth of 14 feet 3 inches. Options include load-sensing hydraulic system, adjustable flow control and ISO/SAE operator control patterns. **877/509-2254; www.hceamericas.com.**

ECCO wireless reversing camera

The EC5605-WK wireless reversing camera system from ECCO Safety Group includes 5.6-inch LCD touch-screen color monitor and CMOS color infrared camera. The system delivers high-quality images in low light and is expandable up to four cameras. **800/635-5900; www.eccogroup.com.**

ONSITE installer™ classifieds

Place your ad online at: www.onsiteinstaller.com

AERATORS

We sell Flagg-Air 340, Secoh, Gast and Medo Linear, FPZ and Gast Regenerative, Thomas and Gast Rotary Vane aerators, rebuild kits and alarms at wholesale prices. Septic Services, Inc. www.septicserv.com. 1-800-536-5564 (IM)

Blue Diamond Aerators, 60-120 liters, in stock, low cost. Free next-day shipping. 866-631-5124 (IM)

BUSINESSES

Established septic installation and pumping business for sale in North Central Texas, in the growing Cline Shale oil boom. Modern equipment with established grease accounts. Owner ready to retire. $850,000. Inquire asl5662@windstream.net (I08)

Turnkey septic and storm shelter company. Forms, trucks, equipment and inventory, 3.5 acres, newer metal manufacturing building and office. $1,700,000. 575-756-9990 or nancy.klemp@yahoo.com. Listed by EZ Realty, LLC. (P07)

DRAINFIELD RESTORATION

Soil Shaker 2000. Universal skid steer attachment for drainfield restoration. Buy factory direct. $6,250. Check us out on YouTube or call 320-293-6644. (PBM)

New and used terralifts for sale starting at $20,000 used and $38,000 new. Financing available. Call Dick Crane 800-223-2256. (PBM)

HAND 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. (IM)

PUMPS

Hydromatic, Zoeller, Liberty, ABS, Myers, grinder and effluent pumps. Lift station packages and high water alarms are also available. Septic Services, Inc. www.septicserv.com, 1-800-536-5564 (IM)

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Innovations in Precast, Drainage & Wastewater Products

Zabel® A Division of Polylok Inc.

PL-68 PL-122 PL-525/625 GF-10 12x20 4x22 4x18

Filter Alarms & Switches

POLYLOK BEST TECHNOLOGY

Effluent Filters / Filter Alarms & Switches

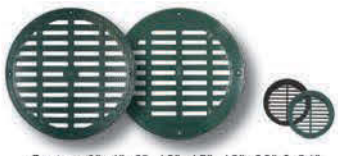
- Easy installation
- No gluing nessessary
- Centers filter or tee under riser

6" Tall Risers 12" Tall Risers

Extend & Lok *(3", 4" & 6")*

Tank Risers *(12", 20" & 24")*

Covers: 12", 15", 18", 20", 24" & 30"



Grates: 3", 4", 6", 12", 15", 18", 20" & 24"

Covers & Grates *(for Polylok Risers / D-Boxes & Corrugated Pipe)*

- One Hydro Shield fits 3 pipe sizes: 1", 1-1/4" & 1-1/2" or 1", 1-1/2" & 2"
- Easy to install, just clip in.
- 360 degree equal distribution

Hydro Shield

- Fits securely onto either 3/4" - 1" pipe or 1-1/2" - 2" pipe
- Constructed of engineered resin
- Slotted design prevents plugging
- Can be installed facing up or down
- 360 degree equal flow distribution with impeller

Orifice Diffuser

6"

Poly-Air
6", 4", 3", 2" & 1-1/2"

6" supplied with 5 lbs. of Activated Carbon!

Activated Carbon Vented Covers 18", 20" & 24"

Activated Carbon Roof Vents & Vented Covers

WE HAVE IT ALL!

New Products

For: Polylok Risers / PVC Ribbed / HDPE Corrugated / Concrete

12", 20" & 24" Safety Screens

Universal Kid Catcher

Help save a child or pet's life with our safety devices!

20" & 24" Lid-Lok Safety Device

20" & 24" Riser Pan

Distribution Boxes

Cover Insulation

Pumps & Air Pumps

STEP Systems

High Pressure Filter

U.V. Disinfection Unit

1-800-701-3946 / www.polylok.com

Your One Stop Shop for Superior Onsite Wastewater Products.