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Create the best  
evaluation pits  
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## BUILDING *a Buzz*

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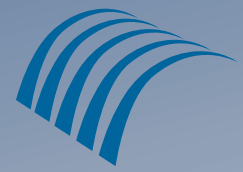
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# Join the Fight

When the government and those opposing mandated onsite system upgrades do battle, installers should let their expert voices be heard

By Jim Kneiszel



**W**hy do we still find regional areas where antiquated cesspools are still allowed as a decentralized wastewater solution a generation or more after they were prohibited in other areas? In the case of Warwick, R.I., like many communities before it that have wrestled with the need to update onsite system technologies, you can follow the money to get your answer.

It's an example of environmental and public health concerns taking a backseat to special interests concerned with profits over effective wastewater treatment. And the battle to stall mandated modernizing of septic systems will inevitably give the onsite industry a black eye and could shake the public's confidence in small-scale private wastewater treatment.

## UPGRADES NEEDED

In Warwick, lobbyists for the Rhode Island Association of Realtors beat back a proposed act that would phase out cesspools serving homes located within 200 feet of a shoreline or water supply. Under the proposed

**Today's buyers invariably hire a home inspector to look at the furnace, roof and siding, and basement foundation, and then negotiate with the sellers over the cost of necessary upgrades. Why should the wastewater system be any different? Just because it's buried in the backyard doesn't mean it shouldn't be top of mind for both parties.**

regulations, cesspools would have to be updated with modern septic systems or hook up to a municipal sewer system within 12 months of a real estate sale.

According to the *Warwick Beacon* newspaper, about 3,000 homes in the city and 25,000 homes in the state are still using cesspools. Proponents of the act, including the state Department of Environmental Management (DEM), argued that the pits do not adequately filter waste and are a hazard.

"Cesspools have not met state standards for wastewater treatment for over 40 years. How long will we tolerate the damage done to our groundwater and drinking water by these antiquated systems?" Jonathan Stone, executive director of the environmental group, Save the Bay, asked in urging lawmakers to pass the point-of-sale upgrades.

A DEM spokesman said the longer cesspools are allowed, the more difficult it will be to reverse the contamination. At the same time, he said homeowners face the threat of sewage backups or potentially dangerous collapse of the deteriorating pits buried in their backyards.

Not so fast, the Realtors group responded. The association said the point-of-sale triggers would dampen an already sluggish home-selling market. They said Realtors believe in clean water and agree that cesspools need to be replaced, but that this move would hinder "a delicate market."

## PAY THE PIPER

"We worked diligently to defeat this bill," Robert Martin, president of the association, told the paper. "As presented, the bill was bad legislation for the blue-collar individual buying a home with a cesspool. It would just compound the hardship on any buyer and the market as a whole."

My response: What about the economic hardship buyers will face after the sale in the potential of a costly backup, tank collapse or the inevitable forced replacement of the system? Isn't point-of-sale the perfect time for buyers and sellers to get together and hash out how the cesspool should be replaced and who should pay?

In my estimation, the function of every major component in a house should be addressed during a property sale. Today's buyers invariably hire a home inspector to look at the furnace, roof and siding, and basement foundation, and then negotiate with the sellers over the cost of necessary upgrades. Why should the wastewater system be any different? Just because it's buried in the backyard doesn't mean it shouldn't be top of mind for both parties.

Cesspools aren't just a threat to pollute; they are an economic ticking time bomb for homeowners. The Realtors know this, yet they called this delay in addressing cesspool replacement "a win for us and for our clients." I'm not so sure ignoring a substandard wastewater system is a "win" for buyers and sellers. Turning your back on this sort of issue is almost sure to lead to disagreements later, or maybe even the courtroom.

## ONSITE REPUTATION AT STAKE

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treatment. Now, thanks to the work of many in the industry, the U.S. Environmental Protection Agency considers new onsite systems a viable option to sewer pipe in many situations.

Everyone who reads *Onsite Installer*, from the backhoe operator in Kansas to the companies developing new and better systems, can take a bow for this. You're serious about improving technology and work hard to learn how to install the latest equipment and help consumers find the best fit for their wastewater treatment needs. This has happened, in some cases, without government intervention. In fact, installers and product developers often push state and county health departments to understand and accept advanced technologies.

You are environmental leaders ... and that's precisely why lobbying and wrangling in Rhode Island, at the expense of clean-water progress, should concern you as a group. What might seem like an insignificant regional battle to some is really emblematic of a continuing widespread lack of understanding about the serious ramifications of not treating wastewater properly.

Indifference to backward thinking like that exhibited in Rhode Island can further delay improvements in the national wastewater infrastructure. Allowing the voices of a small group of self-interested parties to dominate the discussion diminishes the many exciting advances the onsite industry has made. When it comes to issues like replacing outdated cesspools, onsite installers should join in the debate for the sake of the industry ... and the environment.

### MAKING THE POINT

The Rhode Island Realtors group made one last argument to delay the replacement of cesspools during real estate transactions. Their questions can be turned around to serve the onsite industry.

"If this was a public health issue, why doesn't everyone have to do it? Why are the people in the market for a new home being singled out?" said the group's legal representative Monica Staaf.

As you all know, this is a public health issue and all of these cesspools should have been replaced long ago. □

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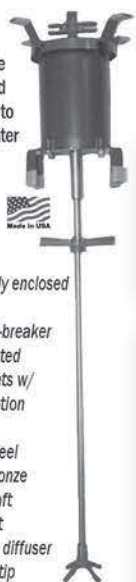
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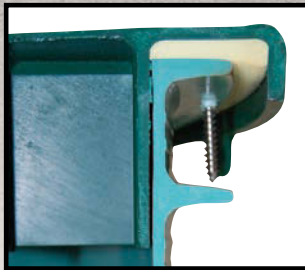
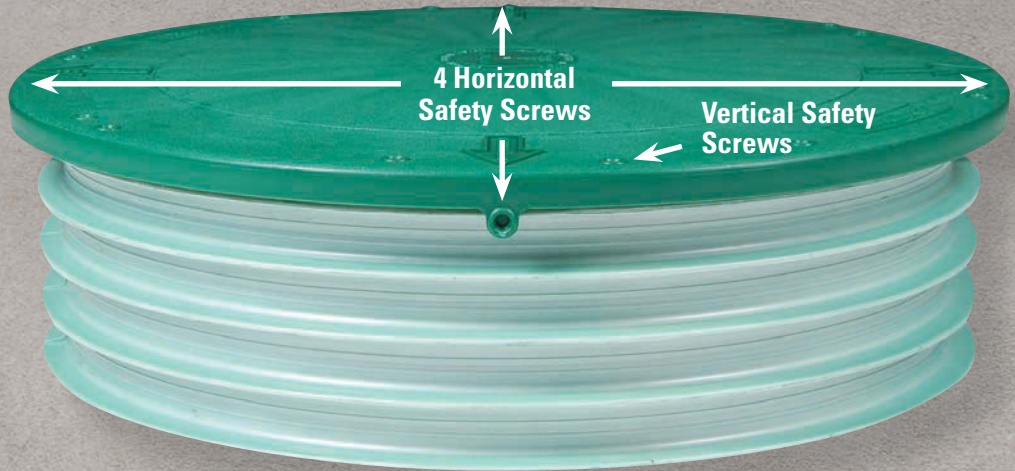
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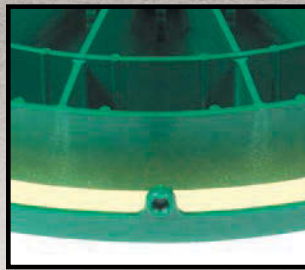
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# BUILDING a Buzz

Thorough customer education and convenient ongoing septic system maintenance help California's Clay's Septic capture repeat business and word-of-mouth referrals

By Ted J. Rulseh

**C**lay Barks doesn't think his customers should have to worry about their onsite treatment systems. He believes the worry should belong to him and his 12 team members.

His business, Clay's Septic & Jetting in Nipomo, Calif., is built around customer confidence, from the extra care his crews take when repairing and replacing systems, to the Worry-Free Septic Maintenance Program that lets owners pay a flat monthly fee for scheduled service visits and pumping.

Customer care is a key reason why, despite diverse and aggressive marketing and promotion, the company still gets 80 percent of its business from repeat customers and customer referrals.

"Our slogan – and you'll see it on our website and in the Yellow Pages – is, 'One call solves all your problems,' " says Barks. "We will take care of your problem, whatever it is. Customers want to know you're going to be there when they need you. We have worked very hard at figuring out ways to make that happen."

## PUMPING, THEN INSTALLATION

Barks got his start in the area working for his father's plumbing business "from the time I could walk." In 1987, at age 28 and licensed as a plumber, he decided to strike out on his own. Not wanting to compete with his dad, he bought a vacuum truck and started pumping septic systems. Barks

pumped the tanks while his wife, Kelly, ran the office. Soon he earned a wastewater contractor license and began working on septic system repairs and, eventually, installations.

### Clay's Septic & Jetting, Nipomo, Calif.

<b>FOUNDED:</b>	1987	
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<b>SPECIALTY:</b>	Onsite system replacement, repair, inspections, pumping	
<b>OTHER SERVICES:</b>	Commercial waterjetting, grease trap pumping	
<b>AFFILIATIONS:</b>	California Onsite Wastewater Association, NAWT	
<b>WEBSITE:</b>	<a href="http://clays-septic.com">http://clays-septic.com</a>	



**OPPOSITE PAGE:** The Clay's Septic & Jetting team, shown at the office in Nipomo, Calif., includes (from left) David Medina, Rudy Uriarte, Clay Barks, Doug Smith and Lucas Mendez. (Photos by Collin Chappelle)

**ABOVE:** Clay Barks is at the controls of a Bobcat E45 excavator working to expose a customer's broken drainfield lines. Clay's Septic & Jetting has a specialty in repair and maintenance work.

About three years into the business, he bought a Case 580 Super K backhoe and brought on Anthony Gutierrez, now a septic technician. A year later, he added his brother-in-law, James Norling, now construction foreman. Today the team also includes:

- Doug Smith, office manager
- David Medina, septic dispatcher
- Lucas Mendez, grease scheduler and backup septic dispatcher
- Justus Erickson and Greg Lewis, septic technicians
- Reyes Martinez, septic technician in training
- Jose Varelas, grease technician and septic technician in training
- Rudy Uriarte and Spencer Comeau, construction laborers
- Ernie Blakey, mechanic and yard laborer

Most often, the company repairs and replaces aging systems instead of building brand-new ones. That's because much of the service territory lies in the wine country of San Luis Obispo and Santa Barbara counties, on the Pacific Coast north of Los Angeles. Land there is more valuable for growing grapes than for housing – the homes tend to be large and costly.

"The median home here in the Central Coast region costs probably \$375,000," says Barks. "We often say, 'You can't afford to live here, but once

## Eye on training

Clay's Septic owner and president Clay Barks believes quality work for customers begins and ends with quality people. To that end, he emphasizes training.

For one thing, all 12 team members have received inspector certification from the National Association of Wastewater Technicians. "Any time we do repair work on a system in San Luis Obispo or Santa Barbara County, we are required to have a qualified person perform an inspection and send a complete report to the environmental health department," Barks says. "Rather than constantly figuring out who could do what, I sent everybody to become certified for inspections, including the office staff."

Barks attends trade shows including the Water & Wastewater Equipment, Treatment & Transport Show (WWETT), formerly the Pumper & Cleaner Environmental Expo, where he takes in as many educational seminars as possible. Back at the office, he shares what he learned.

Last year, after purchasing several nozzles from Enz USA for the company's Harben waterjetting unit, Barks held a training session to show how to use them to clean efficiently without damaging the pipes being cleaned.

Several team members have attended training to service Orenco aerobic treatment units. "We had Infiltrator Systems representatives here and do some education for us," Barks says. "I've done some classes with Liberty Pumps. If somebody calls and says they want to come by and teach us something, I say yes."

Clay Barks uses a RIDGID NaviTrack Scout locator to track a septic system line for a customer.

you do, you don't want to live anywhere else.' If the temperature is less than 50 degrees, it's cold. If it's more than 80, it's hot."

The area's onsite systems need repairs or replacement largely because they are old, but also because many are undersized. "In the 1980s, the counties changed the way they calculated the size of a leach system," Barks says. "The size is based on a perc test. If the soil percolates at, say, 30 minutes

**"We make our systems extremely maintenance-friendly. I tell the guys that if I'm going to be the next to dig up this lid, I only want it 4 inches deep, or on the surface if that's legal, secured with screws. We also use our smartphones to get a GPS of the location of the septic tank."**

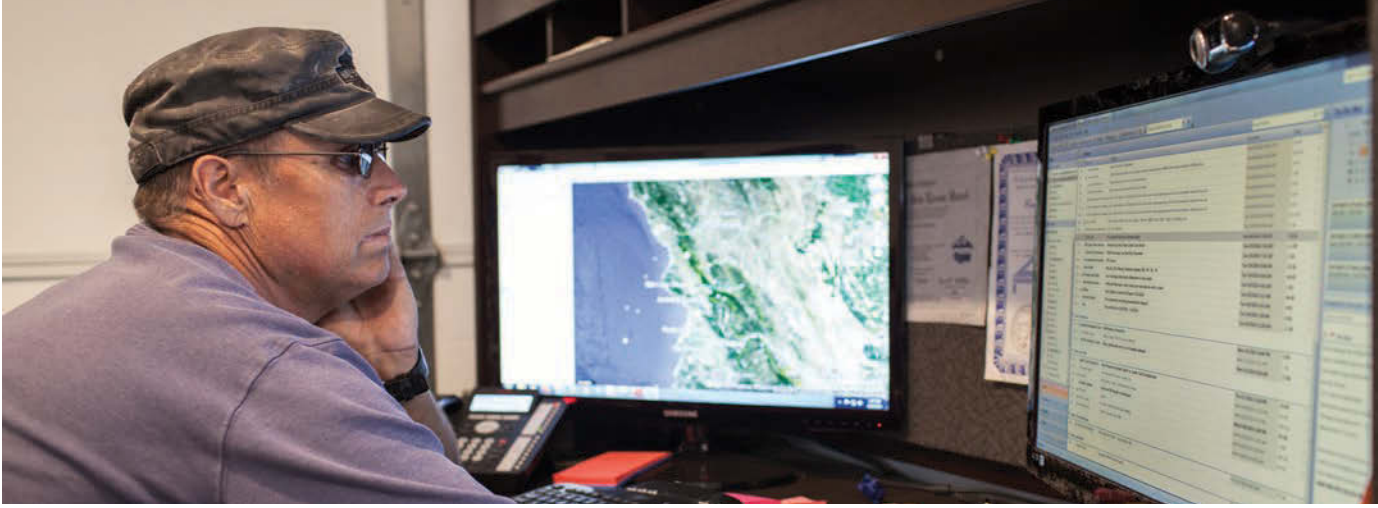
**Clay Barks**

per inch, you're allowed to build a very short leach system. They don't consider what will happen when the biomat builds up. Once it does, the system is inadequate for four people. Systems on hillsides will surface and run into the neighbor's yard. On flatter land, the systems will back up in the house. We end up going in and making the systems work."

### **CUSTOMER EDUCATION**

Replacements are common enough that the company installs 50 to 70 systems per year. That takes a full-time, three-member crew led by Norling; Barks leads a second crew when needed.

The installation equipment fleet includes a Caterpillar 420E backhoe, a Bobcat E45 zero-tail-swing excavator that serves well in tight spaces and a Schaeff HR 12 mini-excavator.



Clay Barks monitors the daily progress of jobs performed by his crew of a dozen workers from his office in Nipomo, Calif.

The company is transitioning from concrete septic tanks to IM-1530 plastic tanks (Infiltrator Systems) for their lightness and ease of handling. About 80 percent of new leachfields use high-capacity chambers (Infiltrator); the balance use EZflow media (Infiltrator) or rock and pipe.

Replacement business comes mostly from Clay's Septic pumping personnel who notice system problems during regular service. While it can be delicate explaining to a customer that a system needs replacing, Barks uses tests that make the diagnosis conclusive and remove owners' doubts about the necessity of repairs. Inspections and locating using push cameras and a NaviTrack Scout (RIDGID) show customers broken sewer pipes. A simple "rock test" using water probes (T&T Tools) demonstrates leachfield problems.

"Even if it's a chamber system, we still call it a rock test," says Barks. "We add water to the leach system through the water probe. If water returns to the septic tank, we have the customer come out and observe, and then we do an interview. I don't like to use the word 'failed,' because that is a complete misnomer. The fact is that the leach system is not failed. It's just saturated – maybe they had a wedding in the yard the past weekend.

"We talk to them about why the system might be saturated. We ask them about their water softener and how much salt they've been using. We check in the septic tank for evidence of leaks from the house – we talk to them about leaky toilets. If we can't come up with a reason for the system being saturated, we tell them they have three choices. They can live with what they have, which is not much of a choice. They can cut back on water usage, which customers tend not to do. Or they can have us put in a new leach system. If they have the money for a replacement, that's usually a quick conversation. If money is an issue, we explain how they can use less water, such as with low-flow showerheads and water-saving toilets."

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Clay Barks explains a necessary repair to a customer. The owner of Clay's Septic & Jetting prides himself on customer service and education.

Trenches are installed using a laser level (Topcon); chambers are placed on virgin soil – not on backfill material – greatly limiting the chance of settling.

“Every one of our leach lines has an inspection port at the end, so we can come back in the future and see how well our leach system is working,” says Barks. “I’m also a big advocate of drop boxes and sequential distribution. I designate which trench I want the water to go to first. Then it goes to the second, then to the third and so on. In a gravity-fed system, that is the only way to go.”

**“If I could give a free tip to any maintenance provider, it would be to stop filing records by invoice number or customer last name and file by address.”**

**Clay Barks**

“We also have a policy that when we touch a system, we own it. Consequently we don’t just put a new leach line on the end of the existing line. We dig all the way back to the septic tank. First of all, the tank has to be brought up to code. We put in 24-inch risers, 5,000-pound-capacity lids and PL65 effluent filters [both Polylok].

“We make our systems extremely maintenance-friendly. I tell the guys that if I’m going to be the next to dig up this lid, I only want it 4 inches deep, or on the surface if that’s legal, secured with screws. We also use our smartphones to get a GPS of the location of the septic tank.”

After installation, Clay’s Septic personnel talk to the owner about system maintenance but without trying to limit lifestyle choices. “The one thing we do stress is that if you can drink it or eat it, you can put it in your septic tank,” says Barks. “Beyond that, if you want to run a garbage disposal and fill your tank with eggshells and coffee grounds, we’ll be there pumping it more

frequently. If that’s the way you want to live, we’re not going to stop you. Just make sure you keep the hazardous waste out of it.”

### **LONG-TERM CARE**

Customers who receive new systems – and in fact all customers – have access to the Worry-Free Septic Maintenance Program, conceived by office manager Smith and launched about a year ago. The customer signs a six-year contract and pays a monthly fee covering an annual system checkup and pumping every three years. “We also include emergency callout service in the price, so that if something goes wrong with the system, it’s covered,” says Smith.

Smith admits the program can be a hard sell to customers who’ve

just invested thousands of dollars in a system replacement, but they have a six-month window to sign up. As of last May, the program has about 85 subscribers. “Eventually,” says Smith, “we hope to have several thousand homes on it.”

Meanwhile, the septic pumping side of the business thrives. Clay’s Septic is one of three dominant players in the territory, with 10,000 properties in a database. “We have everything organized by address,” says Smith. “To us it doesn’t matter who lives in the house.” Barks adds, “If I could give a free tip to any maintenance provider, it would be to stop filing records by invoice number or customer last name and file by address.”

Records going back to 1987 have been computerized. Team members who work on a system record complete information about it – condition of the tank, baffle and components, presence or absence of a riser, tank and leachfield location, number of people living in the home and more. “We do a full report on every system we service,” Barks says. “That way, when we go back to the property in the future, we know the history of the system.”

### **A FIT FLEET**

The pumping fleet includes a 2015 Kenworth T800 with a 3,100-gallon FlowMark tank and 500 cfm Robuschi RB-DV45 pump; a 2008 Mack with a 3,600-gallon Progress aluminum tank and Robuschi RB-DV45 pump; a 2009 Kenworth with a 3,100-gallon steel tank (IBEX) and Masport H75V pump; a 2004 International 8600 with a 2,500-gallon steel tank (Southern California Tank) and Masport H75V pump; and a 2000 Volvo with a 4,000-gallon aluminum tank (Longhorn Tank) with a Masport H75V pump and a Fruitland RCF500 pump.

The vacuum trucks carry water jetters (General Pipe Cleaners) for clearing residential sewer lines. Clay’s Septic also owns a 2006 International 4300 with a Harben 4016 jetting unit and Progress tank (300 gallons freshwater/500 gallons waste), used mainly for clearing lines in restaurants, mobile home parks and commercial buildings.

*(continued)*



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**LOOKING AHEAD**

As the company looks to continue growing, Barks has his eye on coming changes to onsite regulations. He serves on the Santa Barbara County Local Area Management Plan committee, working to improve management of septic systems and to integrate local regulations with new California rules.

"Supplemental treatment will become a big deal," Barks says. "Some sites in our territory have high or perched groundwater, and the state has tightened regulations affecting those conditions. So in those circumstances we're going to have to use aerobic treatment units." The company has become certified to install and service Bio-COIR and AeroCell single-family residential fixed-film media systems (Quanics).

Clay's Septic team members are ready for the challenge of the more advanced technologies – and determined that whatever they install on a property, the customer will find it worry-free. □

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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](mailto:ander045@umn.edu).

# The Hole Story

When a bucket auger or soil boring won't provide the site plan answers you need, follow these tips to produce the best evaluation pits

By Jim Anderson and David Gustafson

**R**ecently we read an article about an onsite company that provided site evaluations, maintenance and service in addition to installation. One issue they wrestled with was how and where to place soil evaluation pits. While attending workshops in the Southwest, we've encountered similar questions about soil evaluation. The challenge in that region is dealing with a lot of rocks, ruling out effective use of soil probes.

Another development that has led to wider use of soil pits versus borings or probes is the need to evaluate soil structure as a part of the soil evaluation to determine the proper soil sizing factor.

**The pit should be oriented so one of the pit faces captures sunlight for illumination. One important aspect of determining soil color is to have adequate natural light.**

## OLD SCHOOL

In the early years of the University of Minnesota education program, our recommendation for soil evaluation was to determine the approximate location of the soil treatment unit based on where the septic tank would be placed and then look at the surface features of the site, including land slope, direction of the slope, vegetation types, run-on potential and other significant landscape features.

Using a soil probe we would then make a quick survey of soil texture and color within the area to identify unusual conditions. That would be followed by a hand boring using a 3-inch bucket auger in the center of the proposed location to evaluate texture and structure to a 5-6 foot depth. Based on these results and how the treatment area would lay on the contour, additional borings would be conducted at the corners of the rectangle defining the area for the treatment unit.



This soil pit was excavated to 4 feet for safety reasons, and then soil borings were taken to analyze the deeper soil structure.

If soil evaluation is used to establish soil sizing criteria, most states require structure be evaluated. So 3-inch bucket augers have largely been replaced by soil evaluation pits. Using the same approach outlined above, there would be a total of five soil pits for the evaluation. Not only is this a lot of digging, but people have pointed out that the testing alone would disturb or dig up a good portion of the area for the system. This calls for a little guidance about where to locate the pits and, of course, how many pits to dig.

A word of caution: Anytime you excavate or dig, remember to utilize your state's hotline to locate underground utilities!



Testing tools are shown next to this soil pit in an area of rugged terrain.

### THREE SOIL PITS

Our recommendation – consistent with Minnesota rules regulating site evaluations – is to have three soil pits. These should be located within or preferably on the borders of the proposed area. At least one of the pits should be located where reconnaissance probing indicates the most limiting condition of the site. Limiting conditions could be evidence of seasonal saturation, bedrock or dense soil material.

Evaluation pits should be excavated 3-5 feet wide, approximately 4.5 feet deep and 6-10 feet long. Most soil structure occurs within a 5 foot depth of the surface which is the reason for the 4.5 foot depth. This is deep enough to allow evaluation of structure and keeps the pit shallow enough to be safe for the site evaluator.

If texture and color need to be evaluated deeper to make sure that there is not a limiting condition, hand boring or additional excavation can be done, with the

observations made at the ground surface in the spoil pile without entering the pit.

The pit should be oriented so one of the pit faces captures sunlight for illumination. One important aspect of determining soil color is to have adequate natural light. Ideally the excavation is T-shaped with a ramp being the leg of the T. This provides easy access to the face where the soil will be described and allows the sun to shine along the entire face.

### WHAT ABOUT TROUBLESHOOTING?

Another frequent question we receive: Where do I locate the soil evaluation pit if I am troubleshooting a failing system? Here the area of the soil treatment unit is defined and it should be obvious that digging within the system itself would not be a good idea. The method to locate the pit is similar to a site evaluation on an undeveloped lot. Visually survey the site and surroundings to identify evidence of disturbance, the land slope characteristics and if the soil treatment area is subject to surface water run-on.

Then use a hand soil probe, if possible, to make a short survey around the perimeter of the system and, if possible, at points between the trenches in the soil treatment unit. Based on the results of these probes, locate the pit at the perimeter of the treatment unit on the contour that would represent the most limiting soil condition.

You may not be able to select the orientation, but do as described above if you can. To begin, excavate only to the elevation where the bottom of the treatment trenches are installed. Use a bucket auger or soil probe to evaluate deeper, looking for limiting conditions within the specified separation distance.

Hopefully these tips help when you are scratching your head over where to locate your next excavation pit. □



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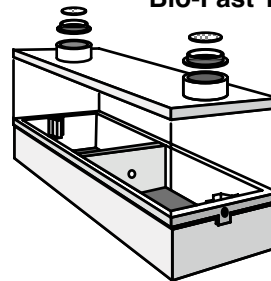
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# Drainfield Restoration Explored

Pro-Pump/Hi-Count bacteria product from Ecological Laboratories receives an annual showcase

By Craig Mandli

**E**cological Laboratories enjoys feedback from its customers every year at the Water & Wastewater Equipment, Treatment & Transport Show in Indianapolis, says Doug Dent, the company's vice president for sales and product development. The 2014 trade show was no different, with the company showing its flagship septic system rejuvenation product, Pro-Pump/HC (Hi-Count).

"We typically get an excellent response at the show," says Dent, "as septic pumpers and installers are always looking for answers to difficult problems and questions."

Pro-Pump/HC has oxidation capability designed to keep the facultative anaerobic and anaerobic bacteria working in an onsite system. The product is a concentrated liquid culture consortium made of 12 select vegetative microorganisms with a specification of 400/500 million microorganisms per/mL.

Dent says Pro-Pump/HC is effective at removing fat, protein and long-strain fatty acids that indigenous cultures can't tackle. "It's able to address and resolve many onsite wastewater issues in tanks and absorption fields. That makes it ideal for septic pumpers, installers and ATU wastewater plant managers."

The product has been on the wastewater treatment market since 1989, but Dent says that over 23 years of working the Pumper & Cleaner Expo (now called WWETT) he's often talking to pumpers and installers about its effectiveness for the first time.

"Over the years our customers have come to expect to see us at the trade show, and this gives us the opportunity to visit accounts that we would never have the opportunity to meet with," says Dent. "At the same time, the show is the one place with everything a septic pumper or installer needs under one roof. It is the best place to meet with and talk, face-to-face, with our existing customers and prospects, and the best opportunity for us to introduce new products and new customers to our product line."

Dent points out that he was able to generate dozens of new leads at the 2014 show. "The accounts we spoke to were very interested in our Pro-Pump products," he says. "We were able to write several orders for new customers at the show and picked up several leads to follow up on."

Dent also uses the show to bounce new ideas off of pumpers and installers. In fact, several products the company now markets essentially got their start through conversations at the show.

"Our absorption field recovery product, the Pro-Pump Bio-Remediation



Doug Dent, left, vice president of sales and product development for Ecological Laboratories, discusses his flagship product, Pro-Pump/Hi-Count concentrated liquid culture consortium, in Indianapolis in 2014. (Photo by Craig Mandli)

Kit, was launched at the show," says Dent. "We try to improve or introduce new products or technologies each year that may be of interest to our customers and prospects alike. We take the time to develop products that will fill a need in the field."

Another of the company's newer products, Pro-Pump/TST Plus, was introduced last year to fill another need Dent heard about from attendees at the show. "Customers wanted something a homeowner could easily use that would cut down on drain odors, remove organic buildup and provide a benefit to the septic system," he says. "The show was an excellent venue to debut this new product."


Dent says the company is looking forward to coming back to Indianapolis in 2015.

"Indianapolis is a city that understands trade shows and how to handle the large crowds that come," he says. "There are plenty of hotels and great dining options within walking distance of the convention center. We are currently working on some new technologies, with an eye on the 2015 show." 800/326-7867; [www.propump.com](http://www.propump.com). □

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The crew from Towers Concrete Products – Travis Newman at far left, Brody Towers (second from left), Tim Schreiber (third from left running the crane), Robert Blockston (fourth from left), Paul Hayes (fifth from left with his back to the camera), Tim Davis (kneeling on the tank) and Bill Towers running the backhoe – finish setting the filtration tank for the Hydro-Kinetic system. (Photos courtesy of Towers Concrete Products)

# Chesapeake Test

Installer Bill Towers is field-testing the Norweco Hydro-Kinetic treatment system in his own backyard as an onsite solution in an environmentally sensitive region

By David Steinkraus

The first Norweco Hydro-Kinetic wastewater treatment system to be installed in the State of Maryland is right where Bill Towers wants it: close, where he can keep an eye on it. There is more to this than his curiosity. It is a field validation of the system.

Under state rules, Towers says, 12 Hydro-Kinetic systems must be installed in the course of a year, become field certified and accumulate a year's worth of good test results before installers will be allowed to offer the systems to their customers. So Towers and his people will be taking composite samples four times per year, once each season, and these will be analyzed by a commercial laboratory.

Towers' company, Towers Concrete Products Inc., is in Denton, Md. It sits on the Delmarva Peninsula that juts into the Atlantic Ocean and forms Chesapeake Bay on its western side. Almost all of Delaware and the eastern part of Maryland fit on this piece of land, plus a little bit of Virginia.

The economy is heavily dependent on agriculture, especially poultry. The headquarters for Perdue, the national chicken producer, is about 45 miles

## SYSTEM PROFILE

<b>Location:</b>	Denton, Md.
<b>Facility served:</b>	Towers Concrete Products Inc.
<b>Designer:</b>	Bill Towers
<b>Installer:</b>	Towers Concrete Products Inc.
<b>Type of system:</b>	Norweco Hydro-Kinetic treatment and dispersal in 250 linear feet of plastic pipe
<b>Site conditions:</b>	Light sandy soil
<b>Hydraulic capacity:</b>	600 gpd

from Denton in Salisbury, Md. From Towers' office it's about 45 miles to the Atlantic and about 45 miles to Chesapeake Bay, and his company serves the entire peninsula down to the Virginia border. This puts him right in the middle of the territory affected by new clean-water rules for the bay, and that is what makes his test of the Norweco system so important. If approved by the state, it will give installers another option for the very environmentally sensitive properties in his part of the country.

**"We do a lot of work replacing longtime systems, and most of those are on smaller lots where there isn't a lot of space to install a system. Many of these are located in the critical Chesapeake Bay watershed."**

**Bill Towers**

### THE SITUATION

There was nothing wrong with the old system at Towers Concrete. It was a typical 1,500-gallon, two-compartment concrete tank that was installed in 1999 when the present office building was constructed. Next to it was 250 linear feet of standard perforated 4-inch plastic pipe laid over a stone bed. Towers retained that to disperse water from the new Hydro-Kinetic system.

Soils are light and sandy, so there was no question about good drainage. The water table is not a complication at his property. "In the area we service, the water table is an issue on most of this part of the shore," Towers says. That includes some islands in Chesapeake Bay, and the Hydro-Kinetic equipment should be advantageous in those situations because its effluent is very clean and will help prolong the life of the discharge system, he says.

The Hydro-Kinetic installation is spread across three concrete tanks, manufactured by Towers Concrete. From the office, waste flows through a 4-inch pipe and into a 750-gallon settling and pretreatment tank.

Water then flows into a 1,300-gallon, three-chamber tank. The first chamber is an anoxic section for denitrification and some digestion. Next is an aeration chamber for aerobic digestion of waste. Last is a clarification



**ABOVE:** The big three-chamber Hydro-Kinetic tank is set outside the offices of Towers Concrete Products, with Robert Blockston (right) and Travis Newman (second from right) looking on. Bill Towers is running the backhoe. The Towers installation covers only a couple hundred square feet.

**RIGHT:** With the lids removed from the three-chamber tank, the Hydro-Kinetic equipment is shown installed and ready for operation.



This is the finished Hydro-Kinetic installation at Towers Concrete Products. The single tank at top left is the pretreatment tank. The three-chamber, main Hydro-Kinetic tank is at right, and at lower left is the filtration tank with its suspended growth media.

chamber with a recirculating pump to send a portion of the water back to the anoxic chamber.

From the large tank, water flows into the last stage, a 319-gallon filtration tank. Inside is enclosed growth media. As water fills the tank from the bottom inlet, it submerges the media and bacteria attached to it digest more of the organic material in the water. From this tank an outlet takes water to the drainfield.

Because it was a test and his own project, installation of the Norweco system was put off for months by other work and then by the harsh winter. The job waited until spring.

“We did it in a day,” Towers says. “We put it in the morning of some bad weather. I had a lot of help because we weren’t very busy.”

### FLEXIBLE ARRANGEMENT

Norweco components are dropped into the proper compartments. The design at the Towers property didn’t have much room to work. The pretreatment chamber is one tank. The three-chamber arrangement is a second





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Brody Towers (left), Paul Hayes (second from left) and Robert Blockston (right) set the filtration tank for the company's Hydro-Kinetic installation. The tank has suspended growth media to increase the removal of organics.

tank and filtration chamber is a third. All are plumbed so they form three sides of a rectangle and fit into slightly more than 160 square feet.

The ability to mix and match tank sizes provided a needed flexibility for Towers' own project because the space where the system went in, between his office building and the road, is very small. At the moment, concrete tanks are the only option for this system, but flexible tank sizes have many uses in his territory, he says.

"This is a very rural area, and you've still got a lot of individual septic systems," he says. "We often run into space constraints just like the ones at our office. We do a lot of work replacing longtime systems, and most of those are on smaller lots where there isn't a lot of space to install a system. Many of these are located in the critical Chesapeake Bay watershed."

**"It's primarily a gravity-flow system, and the only mechanical parts are the aerator systems and recirculation pumps. The big thing is, if you lose power they'll still work as a gravity-flow system."**

**Bill Towers**

Towers likes that the Hydro-Kinetic system will work even through power outages. "It's not a really complicated mechanical system. It's primarily a gravity-flow system, and the only mechanical parts are the aerator systems and recirculation pumps. The big thing is, if you lose power they'll still work as a gravity-flow system. Out here where we are, we occasionally lose power for periods of time," he says.

Typical Norweco systems Towers installs use aeration only. He sees the combination of suspended and attached bacterial growth in the Hydro-Kinetic system as good for Chesapeake Bay and the installers who serve the people living near it. "I'm anxious to field-test this system and see what it will do," he says. □

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# Michigan Bill Aims to Allow Pumpers to Continue Using Their Storage Facilities Beyond 2025

By Doug Day and Sharon Verbeten

The Michigan House of Representatives passed a bill simplifying several provisions of laws dealing with septage. The bill now awaits action in the Senate.

The bill (HB 4874) eliminates a sunset provision that applies to pumpers with storage capacity of 50,000 gallons or more. As of 2025, those pumpers would be required to off-load at a receiving facility within 25 miles of where the septage was pumped. The requirement still exists for smaller operators. The bill also overrides local ordinances that impose requirements stricter than the state law.

According to a summary by the Natural Resources Committee, the bill was opposed by officials in Grand Traverse County because it would affect the amount of septage disposed of at a wastewater treatment facility that

was built with excess capacity. Local officials worry that loosening the disposal rules will require municipalities to foot a bigger bill to support the facility.

## New York

A proposal by the Suffolk County executive to provide sewer service or upgraded septic systems for 209,000 homes could cost around \$7 billion. The county estimates it would cost \$30,000 to \$35,000 per house to install new onsite wastewater systems and about \$50,000 to connect each home to a sewer. More than 70 percent of Suffolk homes currently use onsite systems.

The county will look into state and federal grants to help pay for the improvements.

## Ohio

Proposed rules regarding septic systems in Ohio are expected to take effect next January. The regulations are designed to modernize requirements to account for soil types and the amount of water generated by homes.

The Ohio Department of Health says 31 percent of system failures are due to soil conditions, which wasn't addressed in the current rules written 35 years ago. The new rules would only apply to new homes or systems needing replacement. Officials are hoping the rules will help make consumers more informed about their onsite wastewater options.

## Minnesota

Minnesota has become the first state to ban the sale of antibacterial soaps, bodywashes and other products containing triclosan. The ban takes effect January 2017. According to the U.S. Food and Drug Administration, about 75 percent of antibacterial soaps and bodywashes contain the chemical. While not dangerous to humans, it is suspected to contribute to drug-resistant bacteria and disrupt reproductive hormones in some animals.

According to the University of Minnesota Onsite Sewage Treatment Program, normal use of antibacterial products is acceptable, though it destroys some good and bad bacteria in a septic system. Excessive amounts of these products, however, "can cause significant and even total destruction of the [bacteria] population."

In a fact sheet, the university says, "Several professionals have reported problems with low or no bacterial activity in systems and upon the removal of antibacterial products from the home, beneficial bacterial activity returns and desired treatment functions resume. These products affect all treatment systems but because of special attention being paid to new 'alternative' treatment technologies in the onsite industry, it is possible that some systems may be more affected by fluctuating bacterial numbers than others. More research needs to be done on this as well." □

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# The Lifeblood of Your Equipment

The right hydraulic fluid will keep your skid-steer, track loader, mini-excavator or other compact equipment on the job site and working at peak performance

By Ed Wodalski

Selecting the proper hydraulic fluid for your skid-steer, track loader, mini-excavator or other compact equipment is fairly easy – simply follow the manufacturer’s recommendations.

You’ll find the recommendations in your equipment owner’s manual. John Deere, for example, fills its 36G mini-excavator with Super EX 46HN extended life zinc-free hydraulic oil and warns against mixing brands.

“Oil manufacturers engineer their oils to meet certain specifications and requirements,” the John Deere manual says. “Mixing different oils can degrade lubricant and machine performance.”

## VISCOSITY AND TEMPERATURE GUIDELINES

That doesn’t mean you can’t use an oil equivalent to the manufacturer’s brand in your machine. But keep in mind that while different brands of oil are similar they might not contain the precise additives required for optimum performance.

John Deere also includes a chart listing recommended oil viscosities based on air temperature. A premium anti-wear (AW) 46 oil, for example, has a temperature range of 14 to 104 degrees F, while Deere’s Super EX 46HN has a temperature range of -4 to 104 degrees F. For low-temperature operation, Deere recommends its zinc-free Daphne Super Hydra A 32 (-22 to 86 degrees F) or an equivalent premium AW 32 oil.



Dirt is the enemy of hydraulic fluid. Keep your system as clean as possible, particularly if using hydraulic couplers. (Photos courtesy of Bobcat)

## Hydraulic fluids at a glance

Hydraulic/hydrostatic oils are formulated to meet the growing demands placed on hydraulic components for varying applications:

- **HIGH PERFORMANCE:** Typically a custom blend of quality lubricants designed to provide peak flow at subzero temperatures, while maintaining stability during periods of high-temperature use.

- **SYNTHETIC:** An advanced liquid technology designed to optimize cycle times and productivity, and provide good cold-weather fluidity for seasonal changes.

- **BIODEGRADABLE:** Introduced to meet customer demand as federal, state and local governments set environmental-related project restrictions. It’s nontoxic and formulated to reduce the potential for environmental damage.

Viscosity and temperature range are important factors to consider when choosing hydraulic fluid. Overheated oil forms varnish, causing valves and other components to stick, resulting in poor equipment performance.

When it comes to biodegradable oils, John Deere advises using only Exxon Mobil EAL EnviroSyn 46H synthetic ester oil and suggests contacting your John Deere dealer for routine oil analysis to meet warranty requirements. The company advises draining and refilling hydraulic tank oil in the mini-excavator every 2,000 hours. And be sure to dispose of all used oil and filters properly.

Bobcat recommends using its self-branded all-season hydraulic/hydrostatic fluid. The oil is designed to provide optimum flow at subzero temperatures, while maintaining stability during periods of high-temperature use. The company says its oil cannot be duplicated by off-the-shelf fluids. Bobcat also offers a synthetic hydraulic/hydrostatic fluid for improved cycle times, increased work output and smoother operation, as well as an environmentally

Make it a point to check your hydraulic lines for leaks. If oil can escape, dirt and dust can re-enter the system, shortening the life of your equipment.

friendly, biodegradable hydraulic oil with anti-wear and corrosion protection additives for equipment manufactured after 2004.

### KEEP IT CLEAN

So what exactly is hydraulic fluid?

Its main purpose is to transfer power across distance. The other job of hydraulic fluid is to protect against wear, rust and corrosion, as well as cool and clean internal components.

Most hydraulic fluids are formulated from hydrocarbon base oil or molecularly reformulated synthetics. Some environmentally friendly biodegradable hydraulic fluids can be vegetable-based, while fire-resistant hydraulic fluids may even be water-based.

Because of small tolerances in equipment components it's important to keep hydraulic fluid clean.

"Dirt is the real enemy. Microscopic dirt will wear it out too," says Bruce Coleman, co-owner of Coleman Equipment, dealer for Case and Kubota equipment, with locations in Kansas and Missouri. "Keep the system as clean as possible, particularly if you're using hydraulic couplers. At least wipe the darn things off before you connect anything so you don't ingest a certain amount of dirt into your system."

Chris Barker, tech services manager at Royal Purple, maker of synthetic, commercial-grade lubricants, says it's always best to follow OEM recommendations when selecting hydraulic fluid.

"First and foremost make sure if you're replacing a fluid that you're using the same type," he says. "Next you need to look at the viscosity grades that are recommended."

### MAKING THE GRADE

Most industrial fluids use the ISO viscosity grade scale rather than the more commonly understood SAE grades – 20, 30, 40, 5W-30, 10W-40.

"In the past, most hydraulic fluids were SAE 20, but they had a very broad range of viscosity possibilities," Barker says. "The ISO viscosity grades narrowed that down. The most common hydraulic oil viscosity grade in the ISO category is 32, 46 and 68. And all of those fit within the SAE 20 range."

One way to ensure the hydraulic oil you're using is working properly is to have an oil analysis performed.

"An appropriate oil analysis program will show you wear metals that are being generated, contaminants that are getting in the oil, as well as changes that are happening to the oil," he says. "For that to be meaningful it needs to



**"An appropriate oil analysis program will show you wear metals that are being generated, contaminants that are getting in the oil, as well as changes that are happening to the oil. For that to be meaningful it needs to be a trend so you can see what is happening over time. One oil analysis from a particular change isn't telling you a whole lot."**

**Chris Barker**

be a trend so you can see what is happening over time. One oil analysis from a particular change isn't telling you a whole lot."

An oil analysis can cost from \$15 to \$20 per sample at a consumer lab or \$25 to \$30 at a commercial lab. While both might do an adequate job, Barker recommends using a commercial lab because of the accuracy and detailed information provided.

### STORING FLUIDS

When storing unused hydraulic fluid, make certain the package is intact and the closure or lid is secure, Barker says.

"Keep the temperature relatively consistent. Don't store it in direct sunlight and don't let it get rained on," he says. "Best case scenario is to keep it in a climate-controlled environment. Big temperature swings can cause the packaging to breathe, pushing hot air out and cool air in."

Ambient air contains numerous contaminants; the most common is humidity.

"Dry oil is the best oil," Barker says. "When you introduce water into oil and introduce that into equipment, you raise the risk of corrosion and degradation."

Remember, the life of your machine is in the oil. Be sure to change it. **□**

# We Need Inspection Standards

Connecticut decentralized wastewater professionals work with state officials to set consistent system-evaluation protocols

By Doug Day

**I**n December 2002, Janice Cavanaugh was preparing for the Christmas holiday when her septic system failed. While the onsite system was being replaced, a sanitarian and member of the Connecticut Onsite Wastewater Recycling Association (COWRA) stepped in and halted a poor installation job. Cavanaugh was thankful for the professional oversight.

Little did Cavanaugh know at the time that five years later she would become the executive director of the organization of onsite professionals in a state where 40 percent of residents are dependent on septic systems. While she does not have an onsite wastewater background, Cavanaugh is a consumer who uses a septic system and appreciates the important role played by the members of COWRA in protecting the environment, public health and consumers.

## What did you do when your septic system failed?

**Cavanaugh:** I did as anyone would do; I got out the Yellow Pages. I was just your average consumer. The local sanitarian, Thad King, was experienced and knew the installer was putting in an inappropriate system that was going to fail, and the fill he was using was junk and was not going to work. Thad fought with the installer and finally told him to stop and take out everything. The installer was really taking me for a ride and the inspector knew it. If not for [King], I would probably have had to install another septic system by now.

## Inspections have become a big issue in Connecticut recently. How did that come about?

**Cavanaugh:** Two years ago, legislation was proposed that would have required a septic inspection for the sale of any commercial or residential building with a septic system. That sounds like a great thing for our industry. However, Connecticut doesn't have a law about who can be a septic inspector; anyone can call themselves an inspector. And there is no protocol for doing inspections. There is suggested guidance, but nobody really knows what a septic inspection is in the State of Connecticut.

We have a lobbyist, David Evans, who has helped us for many years. Because he found out about this bill early, we were able to get to the committee meetings to inform legislators why it wouldn't work. Everyone was up in arms about the bill and it died in committee.

It is a great idea for the industry because it will bring in work. It's a great idea for consumers because they are going to pay the price for a bad

inspection. So the state asked COWRA to help put together an inspection program, and that work is underway. One of our board members, Gary Yuknat of Shoreline Sanitation, is heading that up for us as a member of the state's Code Advisory Committee. It is in its infancy and will take a long time.



Contact Janice Cavanaugh at 860-267-1057 or [cowraonline@yahoo.com](mailto:cowraonline@yahoo.com).



Gary Yuknat

**"One of the problems in Connecticut is that the economy hit the housing market so badly. We used to have 60 to 80 people taking our installer classes. The last few years it's been around 30 . . . It's been very hard for young people trying to enter the field."**

**Janice Cavanaugh**

## Gary, how is that work coming along?

**Yuknat:** We're putting together some prescriptive methods of septic inspection. There is no one way to do an inspection, so everybody goes off on their own. It could be a two-minute inspection or four hours. We've been working on it for about a year and it's moving forward. The challenge is how you determine a result. Everyone is looking for a definitive answer. Things aren't pass-fail in this business, sometimes they are a little more subjective because there are so many variables.

## Are there other issues on the horizon in Connecticut?

**Cavanaugh:** The Department of Public Health is writing new technical standards for residential and smaller systems that are going to come out in 2015. We have a very good relationship with the Department of Public Health [standard septic systems] and the Department of Energy and Environmental Protection [alternative treatment systems and those greater

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than 5,000 gpd]. They are a great group of people who really care. But sometimes, things sound really good in theory but don't work in practice. Getting the people who make the laws sitting down with the people who are installing the systems is very conducive to coming up with policies that work for both.

**Yuknat:** The Code Advisory Committee updates the standards every couple of years. A lot of it is because of new technologies and when we discover some changes that need to be made on things that have been approved. There is nothing big coming, just some fine-tuning.

**Cavanaugh:** I don't know how people who aren't members of COWRA stay up to date with changes to the laws and guidance. Our 340 members represent a much larger number of onsite professionals in their companies who care about their work product and a standard of excellence, those people who want to go out and do the right thing. But there are around 2,800 licensed installers in the state.

Our membership is made up of pumpers, installers, cleaners, local sanitarians, regulatory officials, civil engineers, suppliers and those who do inspections. We want a real good working relationship between the industry and the regulators, especially the local sanitarians. Many of them have never installed a septic system; it would be nice if they took our courses so they knew what we were dealing with.

### What is COWRA's role in training onsite professionals?

**Cavanaugh:** We have a Septic Installer School that we do as a courtesy to the state because they don't have a training program for people to get a license. The state approves our study guides to make sure we are teaching the information that is needed.

The class meets on six consecutive Thursday nights for 3 1/2 hours, with one night set aside for a Pumper/Cleaner School that includes people

who just want to do that and don't need the installer license.

One of the problems in Connecticut is that the economy hit the housing market so badly. We used to have 60 to 80 people taking our installer classes. The last few years it's been around 30.

One reason is that part of the license requirement is that you do four installations under someone else's license and have a local sanitarian sign off on them. That's a great internship and shows that you can put in a viable system. But with the housing market, we don't have many installations. It's been very hard for young people trying to enter the field.

We do have experienced installers taking the course sometimes. Not to take the test again, but just to learn the material. The industry isn't what it was years ago and there are no continuing education credits required in Connecticut.

The state does offer classes such as a really good course on soil testing. It's a great program and we suggest our members take it because it's real helpful if an installer has a good understanding of soils. The state has suggested that they would like some continuing education requirements and I believe there will be in the future. □

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# Systems Repair/Drainfield Rejuvenation

By Craig Mandli

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## ADDITIVES

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### Micro-bacteria septic additive

Easy-to-use BS-916 micro-bacteria septic additive from Simple Solutions is designed to restore necessary bio-organisms in a system, ensuring that the system doesn't become blocked or emit obnoxious odors. It comes in individually wrapped pouches that can be flushed down a home toilet each month, helping restore the natural biological process and boosting the existing biological activity. Regular monthly applications will keep a septic system working and reduce unnecessary pumping and maintenance. It is safe, natural and environmentally safe when used as directed. It contains no corrosive chemicals, caustics or acids, and will not damage metal, ceramic or plastic parts of the drainage system. 973/846-7817; [www.industrialodorcontrol.com](http://www.industrialodorcontrol.com).



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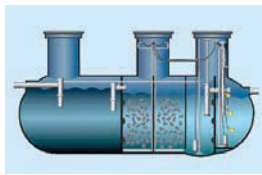
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The White Knight Microbial Inoculator Generator from Knight Treatment Systems introduces, cultivates and releases task-specific selected microorganisms for the enhanced biological augmentation of onsite treatment systems. The system is designed to provide aggressive nonpathogenic bacteria to wastewater to assist in the metabolism of waste. Initially developed for the rehabilitation of organically clogged septic absorption systems, it can also be used to retrofit outdated ATUs and package treatment plants. 800/560-2454; [www.knighttreatmentsystems.com](http://www.knighttreatmentsystems.com).



### Aeration treatment system

The EnviroServer ES hybrid, fixed-film, suspended-growth, extended-aeration wastewater treatment system from MicroSepTec has an adjustable two-stage biological process to optimize denitrification. A single five-compartment fiberglass tank incorporates a primary settling/septic chamber, two aerobic chambers, a final settling chamber and an effluent chamber to house optional disinfection units and/or effluent pumps. The single-tank design requires only one excavation so it can be installed on small or sloped lots. The heavy-duty tank is light to transport and can be maneuvered with typical installation equipment. For ease of maintenance, components are accessible at grade. It is available in three residential sizes: ES6 (600 gpd), ES12 (1,200 gpd) and ES25 (2,500 gpd). 877/473-7842; [www.microseptec.com](http://www.microseptec.com).



### Aerobic wastewater treatment system

The Singulair Green aerobic wastewater treatment system from Norweco incorporates an advanced aerobic treatment process into a durable, watertight polyethylene tank. It offers single tank convenience and contains pretreatment, aeration, clarification, filtration, flow equalization and optional disinfection and dechlorination. Incorporating support ribs and inherently strong arch shape, the durable tank provides decades of reliable performance. It is designed for domestic wastewater flows up to 600 gpd, with treatment performance meeting or exceeding the strictest state and county requirements, certified to NSF Standards 40 and 245. 800/667-9326; [www.norweco.com](http://www.norweco.com).



### Repairing treatment system

The AdvanTex AX-RT Series of advanced wastewater treatment systems from Orenco Systems is designed for system repair and rehabilitation. All interior components are installed, plumbed and adjusted at the factory. Units can be shallowly buried for use between a functional, watertight septic tank and a functioning drainfield. The three-in-one design includes recirculation, treatment and discharge in a single unit to simplify installation and eliminate the need for additional tanks, basins, risers and lids. The system can be maintained with an annual service call. Filters and textile media are accessible and cleanable, and control panels are touch-safe. No blower is needed for the passively vented system. An optional UV disinfection unit is available. 800/348-9843; [www.orenco.com](http://www.orenco.com).



### Cyclical treatment system

The PekaSys Bubbler sequencing batch reactor 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 retrofit of existing tanks. The system can reduce BOD<sub>5</sub> and TSS to less than 10 mg/L and provide greater than 50 percent total nitrogen reduction. 877/735-2797; [www.pekasys.com](http://www.pekasys.com).



### Nonmechanical ATU

The NSF International-certified Ecoflo Coco Filter from Premier Tech Aqua is designed to fully protect ecosystems using a natural coco husk fragment-based filtering media that biologically treats pollutants and acts as a barrier to retain solids. The choice of natural organic filtering media allows for recycling of the spent filtering media to produce renewable energy or compost for soil amendment. With a filtering media capable of sustaining a 40 percent increase of treatment capacity, it offers a large, compact filtering media surface and uses no energy to treat wastewater. 800/632-6356; [www.premiertech aqua.com](http://www.premiertech aqua.com).



### Drainfield dispersal system

Advanced Enviro-Septic from Presby Environmental has been successfully tested and certified to NSF 40, Class I (a certification typically given to mechanical aeration devices), BNQ of Quebec, Class I, II, III and Cebedeau, Belgium, standards. It is composed of corrugated, perforated



plastic pipe, Bio-Accelerator fabric along its bottom, which is surrounded by a layer of randomized plastic fibers, and a sewn geotextile fabric. It creates an ecosystem designed to simultaneously purify and disperse effluent after primary treatment by a septic tank. Bio-Accelerator screens additional solids from effluent, accelerates treatment processes, ensures even distribution and provides additional surface area. Each foot of pipe provides over 40 square feet of total surface area for bacterial activity. 800/473-5298; [www.presbyenvironmental.com](http://www.presbyenvironmental.com).

### Residential trickling filter system

STAAR (Smart Trickling Anaerobic/Aerobic Recirculating) filter systems from SeptiTech, a subsidiary of Bio-Microbics use an enhanced, unsaturated media filter technology for the equalization and clarification process to treat high-organic loads that integrate with other technologies and accessories. They also maintain low levels of Nitrate-N, with all below-grade components that fit in readily available concrete, plastic or fiberglass tanks. The smart controller recognizes situations dealing with peak, low, intermittent or no-flow conditions, allowing the system to go into a sleep mode that will dial down activity and eventually shut all power off until normal flow conditions are detected. This allows the system to achieve lower operating costs and power requirements. 800/318-7967; [www.septitech.com](http://www.septitech.com).



### Aerobic bacterial generator

The S-600 aerobic bacterial generator from SludgeHammer Group is certified by the International Association of Plumbing and Mechanical Officials Research and Testing Inc. and to NSF/ANSI Standard 40 as an advanced treatment system for residential wastewater. It is engineered for subsurface drip disposal. It uses microbes to process waste in the septic tank; then the organisms migrate to and remediate clogged leachfields. Complete digestion of effluent means nothing remains to create a biomat. It is an alternative to repairing or replacing failed absorption beds. 800/426-3349; [www.sludgehammer.net](http://www.sludgehammer.net).



### Nitrogen removal system

The WaterNOx nitrogen removal system from Waterloo Biofilter Systems can be installed following any aerobic treatment unit. Featuring a nontoxic carbon source, nitrified effluent from the treatment unit is then 100 percent denitrified in the system. It uses a permanent, absorbent filtration medium, can be installed above or below ground, uses very little energy, and requires little maintenance and no backwashing. It recovers quickly from upsets such as disinfectant use at the facility. Used for both new installations and to retrofit underperforming systems, total nitrogen concentrations of less than 5 mg/L can be consistently achieved with proper design and maintenance. 866/366-4329; [www.waterloo-biofilter.com](http://www.waterloo-biofilter.com).



## JETTING

### Jetter/pressure washer combo unit

The Performance line of trailer-mounted jetter/pressure washer combo units from Amazing Machinery is designed for easy trailering, and the large water supply tank allows technicians to jet anywhere. A rear-mounted 12-volt electric jetter hose reel and SS rear stack-mounted manual pressure washer and garden hose reels provide ample hose space. They come standard with 300 feet of jetter hose, two nozzles and a



complete set of washdown accessories. The triplex ceramic plunger pump provides pressures up to 4,000 psi and flow rates up to 15 gpm. 800/504-7435; [www.amazingmachinery.com](http://www.amazingmachinery.com).

### Industrial high-pressure cleaning system

Bull Moose series industrial diesel-driven, oil-fired hot-water high-pressure cleaning systems from Easy Kleen Pressure Systems range from 4 to 10 gpm at 3,200 to 8,000 psi. Options include 9.8, 26 and 58 hp Kohler and Kubota diesel engines, gearbox and belt drives, General or Cat pumps, and 12- and 120-volt burners. The heating coil is constructed of Schedule 80 or 160 pipe and housed in a stainless steel wrap. They have a heat rise of 150 degrees F, allowing the outlet temperature to reach 200 degrees F. The rugged all-welded steel frames are designed to be trailer mounted for extreme conditions. 800/315-5533; [www.easykleen.com](http://www.easykleen.com).



### Water jet drain cleaner

The JM-3080 Jet-Set water jet cart drain cleaning machine from General Pipe Cleaners clears grease stoppages, as well as sand, sludge and ice clogs. It generates 3,000 psi at 8 gpm to break up tough stoppages and flush them away. Vibra-pulse on demand helps the hose slide easily down long runs and around tight bends. A 20 hp Honda engine with electric start and 2-to-1 gear reducer drives the pump, while a 12-gallon buffer tank protects the jet if the water supply can't match the pump demand. 800/245-6200; [www.drainbrain.com](http://www.drainbrain.com).



### Truck-mounted hydrojetter

The O'Brien 7000-T hydrojetter from Hi-Vac Corporation includes all of the features of the O'Brien 7000 Series trailer jetter but is designed for truck-mounted applications. It has flow ranges of 18 to 65 gpm and pressure capabilities of 2,000 to 4,000 psi. 800/638-1901; [www.obrienmfg.com](http://www.obrienmfg.com).



### Portable jetter system

The M30 MaxBlaster Jetter from MyTana Mfg. Company delivers 4.5 gpm at 3,000 psi and is powered by a 390 cc Honda engine. It is mounted on a maneuverable cart with the motor, pump, reel and hose. The hose reel is removable and the unit is also equipped with a reel stand and 50-foot jumper hose to operate it indoors while the gas engine remains outside. The unit comes with 200 feet of 3/8-inch thermoplastic jetter hose, 75 feet of 1/8-inch hose for sink or drainfield lines, and a set of penetrating, cornering and blind thrust nozzles for each hose. 800/328-8170; [www.mytana.com](http://www.mytana.com).



### Portable water jetter

The Model KJ-3100 portable water jetter from RIDGID offers 3,000 psi actual working pressure to handle large commercial and industrial applications. It propels a highly flexible and lightweight hose through 2- to 10-inch lines, providing flexibility without reducing strength. The hose blasts through sludge, soap, grease and sediment blockages, scrubbing the line to flush debris and restore drainlines to full capacity without the use of chemicals. It has a hose reel that can be removed to ease loading, and the unit is maneuverable, as the two-wheeled cart easily fits through standing doors and



negotiates tight turns. The pulse action can be activated to negotiate difficult bends and traps. The reduced number of fittings, hoses and parts minimizes leaks and downtime. 800/769-7743; [www.ridgid.com](http://www.ridgid.com).

### Hybrid hydrojetter

The Model 727 cart-mounted hydrojetter from Spartan Tool is available in a true hybrid version, running on either gasoline or propane by flipping a lever. It can be operated indoors and outdoors without any loss of pressure or flow. It can be used to jet septic lines and drainfields, and produces 3,000 psi, which provides enough pipe-cleaning pressure to scour any line up to 6 inches in diameter, while its 4 gpm of flow moves debris downstream. Pulse technology reduces line friction, allowing the unit to maneuver the corners of drainfields, while its 200 feet of 9/16-inch hose provides enough length to get through most fields in one shot. Standard equipment includes 75 feet of 3/16-inch trap hose for tight bends, seven nozzles for various jetting situations, a washdown wand with adjustable nozzle, jetting gloves, easy winterization for cold climates and electric start. 800/435-3866; [www.spartantool.com](http://www.spartantool.com).



## PRESSURE WASHERS/SPRAYERS

### Belt-drive cold pressure washer

Belt-drive cold pressure washers from Steam Jenny have a life-extending pulley system, which turns the pump significantly slower than if the pump was coupled with the engine crankshaft. Additionally, the belt absorbs engine vibration and allows the pump to be located farther away from the engine heat. They are powered by 9 or 13 hp Honda GX Series engines and have a triplex ceramic plunger pump. They are available with pressure ratings between 3,000 and 4,000 psi, and flow rates vary between 3 and 4 gpm. Thermal pump protection, an unloader valve and a high-pressure relief valve are standard. The unit will automatically shut down if a low oil level is detected. The chassis is constructed from powder-coated, durable seven-gauge steel. Units come with a trigger gun with safety lock, quick-connect nozzles with nozzle control, high-capacity in-line water strainer, gun/wand holder, hose reel mounting adapter and dual rubber isolators. 814/445-3400; [www.steamjenny.com](http://www.steamjenny.com).



### Self-contained hot-water diesel pressure washer

The model 18L34 hot-water diesel pressure washer from Water Cannon has a Kohler KD 420ES electric start 10 hp engine with 12-volt self-contained charging system. It can thaw frozen water lines and clean sewer lines or sediment ponds. It includes a stainless steel coil housing and Schedule 80 coil with one-piece molded insulation combustion chamber. The 12-volt DC oil-fired burner creates a 118-degree F temperature rise. It has an EZ Series General triplex ceramic plunger pump that delivers 4 gpm and 3,200 psi. Accessories include 50-foot hose, trigger gun, wand, chemical injector, five quick-connect nozzles, 9-gallon diesel tank and a four-wheel, powder-coated push-bar frame with 13-inch, no-flat, foam-filled tires. 800/333-9274; [www.watercannon.com](http://www.watercannon.com). □



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**TOP LEFT:** Aaron Ausen, president of the Wisconsin Onsite Water Recycling Association, helps install a 1,300-gallon septic tank donated by Dalmaray Concrete Products as part of the association's second annual Rejuvenate a Family Day. (Photos courtesy of the Wisconsin Onsite Water Recycling Association)

**TOP RIGHT:** Damon Huibregtse, of Dirkse & Huibregtse, assists with the installation of an onsite system for a Janesville, Wis., family as part of Rejuvenate a Family Day.

**BELOW:** Charlene Brace of Janesville, Wis., pictured with her daughter Michelle Mattingly and granddaughter, was the recipient of a new system donated by WOWRA.

## WOWRA members donate new onsite system for Wisconsin family

Members of the Wisconsin Onsite Water Recycling Association (WOWRA) donated and installed a standard residential private onsite wastewater treatment system for a Wisconsin family as part of Rejuvenate a Family Day this summer.

Each year members nominate families in need. This year's recipient was Charlene Brace of Janesville, Wis. Brace suffered a stroke 10 years ago, shortly after her husband passed away. It was about this time her septic system began to fail.

"We are extremely grateful for this wonderful goodwill gesture offered by WOWRA," says Michelle Mattingly, Charlene's daughter and caregiver. "It's one less thing for my mom to worry about while she's trying to get well."

WOWRA member companies donated materials and labor for the design and one-day installation of the system in accordance with their philosophy of environmental stewardship and to maintain and enhance Wisconsin's public health and safety.

"This is an exciting and rewarding day for WOWRA leadership and membership, but more importantly it is a day of necessity for the Brace family," says WOWRA's Roger Fanning. "As we complete WOWRA's second annual Rejuvenate a Family Day, we have not forgotten the true meaning behind this endeavor – helping a family in need and giving back to our community that we are a part of."

Donating products and services for the event were Roger and Don Fanning of Fanning Excavating; Don and Dawn Long of American Septic Service; Matt Wesson, inspector, and Tim Banwell, environmental health director, Rock County; Tom Collins of Collins Sanitary; Aaron and Rob Ausen of Dalmaray Concrete Products; Tim and Kyle Frank of Frank Brothers; Jerry Ellis of Rundle Spence; Jeff Iverson of Infiltrator Systems Inc.; Randy Tischendorf and Pat Kiss of First Supply; Gary Voigt of Lakeshore



Burial Vault; Bill Mueller of County Materials; Damon Huibregtse of Dirkse & Huibregtse; Tom Ryan of Miller-Bradford & Risberg; Sam Lindner of Lindner Brothers Sewer & Excavating; Len LaFrenier of LaFrenier & Sons; Mark Wieser of Wieser Concrete; and Tony Birrittieri of Petersen Supply.

## Ditch Witch presents top sales awards

Ditch Witch presented John Smith of the Ditch Witch Southwest dealership with the Gold Ace Award for top sales volume and named James Patterson of the Ditch Witch Sales of Michigan dealership winner of the Great Catch Program for top sales across all product categories. Ditch Witch also presented Richard Knight of Ditch Witch of North Carolina with the Lowell Highfill Award for being the top salesperson worldwide.

## Hyundai Construction Equipment names Kentucky dealer

Hyundai Construction Equipment named Team Boone to its dealer network, providing sales and service in Bardstown, Ky.

## KOHLER completes 105,000-square-foot addition

KOHLER Power Systems completed a 105,000-square-foot addition to its generator manufacturing plant in Wisconsin. The addition expands storage for product parts and provides increased production capacity. The company also plans to add 300 workers in the next few years.

## Infiltrator installs 420,000-pound molding machine

Infiltrator Systems installed a low-pressure injection molding machine at its Winchester, Ky., manufacturing facility. Taking five months to engineer and nine months to build, the molding machine weighs 420,000 pounds and molds a 15-foot long, 245-pound polypropylene tank. The machine is being used to produce the Infiltrator IM-1530 septic tank.



## NOWRA schedules annual meeting, hires lobbyist

The annual business meeting of the National Onsite Wastewater Recycling Association will be held Tuesday, Nov. 11, at the Westin Westminster Hotel in Westminster, Colo. The association also hired lobbying firm Arnall Golden Gregory (AGG) to represent its interests on Capitol Hill and with various regulatory agencies. Thomas Cassidy will be lead lobbyist.

## Jet Incorporated hires national sales representative

Jet Incorporated is proud to announce that Shelly Wybensinger has joined the organization as a national sales representative. Shelly is a 15-year veteran in the water and wastewater industry. She has an extensive background in many areas including residential and commercial sales, product development, chemical sales and retail distribution. □



Shelly Wybensinger



### ITT Goulds magnetic drive pump

The 3296 EZMAG magnetic drive pump from ITT Goulds Pumps is available in four sizes with a maximum discharge to 620 feet. The line of pumps is compliant with ANSI B73.1 dimensional standards and designed to handle demanding

applications, including fluids difficult to seal and applications requiring zero emissions. 315/568-2811; [www.gouldspumps.com](http://www.gouldspumps.com).

### Metabo LED work lamps

The 18-volt, battery-operated line of LED work lights from Metabo Corporation include the ULA flashlight, SLA inspection/work light and the BSA site lamp. The site lamp features 18 LED lights and two intensity settings that produce 1,800 lumens on high and 1,200 on low. When combined with the Ultra-M 5.2 Ah battery, the lamp runs for seven hours. The inspection/work light has six LED lights, rotating aluminum head and hanging hook. The flashlight has a diecast aluminum head, pivoting head and swivel hook. 800/638-2264; [www.metabousa.com](http://www.metabousa.com).



### Ditch Witch JT9 horizontal directional drill

The JT9 horizontal directional drill from Ditch Witch is powered by a Tier IV 64 hp Deutz diesel engine, delivers 9,000 pounds of pullback force and holds 300 feet of drill pipe. 800/654-6481; [www.ditchwitch.com](http://www.ditchwitch.com).



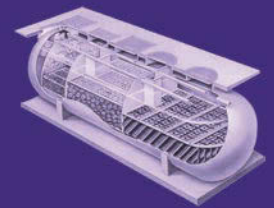
### RIDGID SeeSnake Mini inspection system

The SeeSnake Mini video inspection system from RIDGID has a self-leveling camera head and 200 feet of push cable for laterals and mainlines up to 8 inches in diameter. The 1.18-inch camera has 18 white LEDs. An integrated sonde is standard, broadcasting 512 Hz for above-ground camera location. 800/769-7743; [www.ridgid.com](http://www.ridgid.com). □



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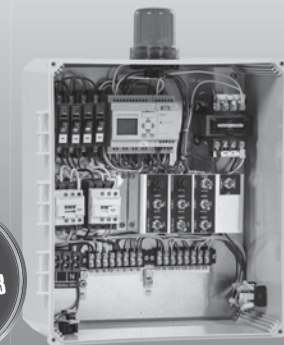
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334/396-3434

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928/443-0333

## Arkansas

Arkansas Onsite Wastewater Association;  
www.arkowa.com

## California

California Onsite Wastewater Association;  
www.cowa.org;  
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## 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;  
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## 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;  
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## 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.maine.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.gsdi.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.psmma.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

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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

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**Ontario**

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