

September

# ON SITE installer™

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2012

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## Onsite **ARTIST**

Even New Hampshire's granite can't  
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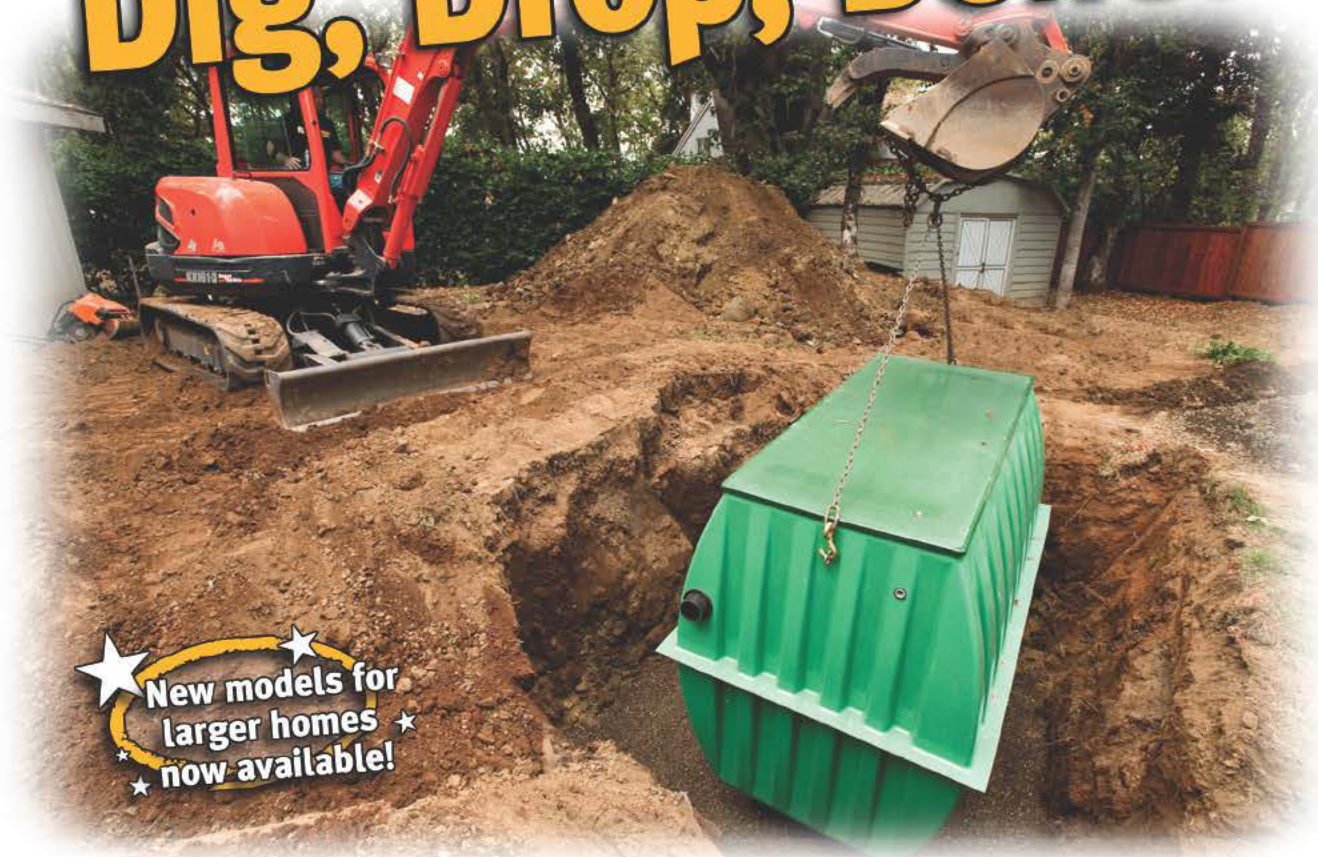
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# Subsidy. A Dirty Word?

Some poor rural areas have major problems with basic sanitation. Should governments step in to provide more financial help?

By Ted J. Ruiseh, Editor



**T**wo months ago, I wrote a column about certain rural communities and their sanitation issues – lack of adequate septic systems – and suggested something needs to be done about it.

Last month, this magazine carried a story about U.S. Department of Agriculture programs that provide support for onsite systems: loans, grants and loan guarantees to develop or improve water and wastewater treatment, including installation of cluster systems for public bodies, tribes and not-for-profit corporations.

Connecting the dots, I hit upon the question: How much government assistance is appropriate for helping solve rural sanitation problems in low-income communities? Surely people who build nice homes in affluent subdivisions don't need or deserve such help. But what about people in impoverished regions who literally have nothing?

## Who gets subsidized?

Especially in today's climate, "subsidy" can be a dirty word. The trend in government at all levels seems to be away from government spending money to fix problems. But then there's the idea that government should do things that need to be done, but that people and communities can't do on their own.

Perhaps in that spirit, our federal government for years massively subsidized the construction of wastewater treatment plants for cities and villages rich and poor. Grants covered as much as 80 to 90 percent of the costs, even though many residents of those communities could well have afforded the full expense. The reality was that without major government intervention, things weren't going to happen.

Going one step farther, most of us who own homes live in subsidized housing – we get federal and in many cases state tax deductions for the mortgage interest we pay. So exactly how dirty is that word subsidy?

## Taking proper care

Now, what about more federal or state money (or both) for a concerted effort to correct the serious rural sanitation problems that we know exist in spots around the country? We subsidized big-pipe wastewater treatment as part of the price for achieving "fishable and swimmable" waters. What if we subsidized well built, fully functional septic systems in the name of protecting the health of rural families?

We didn't seem to mind building sewer systems and treatment plants to serve even the poorest residents of our inner cities. Why would we balk at investing money for sanitation for poor families out in the country?

As a nation we know the condition of our municipal water and sewer infrastructure (generally poor). We also know within reason how much it will take to bring it up to standard:

- For wastewater systems, \$13 billion to \$21 billion per year, for 20 years, according to the Congressional Budget Office.
- For drinking water infrastructure, more than \$1 trillion over the next 25 years, according to the American Water Works Association.

**Do we even have a clue what it would cost to bring desperately poor people's septic systems into acceptable condition around the country?  
(My guess: It would be dramatically less than for fixing municipal systems.)**

Do we even have a clue what it would cost to bring desperately poor people's septic systems into acceptable condition around the country? (My guess: It would be dramatically less than for fixing municipal systems.)

## Where to begin?

If we don't know the cost of the solution, that's a good sign we don't know the extent of the problem. If we find out, then we can collectively decide what to do about it. All right, maybe the government is "strapped for funds" at present, but isn't the provision of safe and sanitary conditions a part of what decent societies do? Isn't it one of those things government must do because people can't do it on their own?

The National Onsite Wastewater Recycling Association (NOWRA) has been campaigning at some level for onsite treatment to receive a larger share of federal wastewater funding, which now disproportionately goes to "big-pipe" systems. Perhaps here is a place to start: Find out (or respectably estimate) just how many homes in badly impoverished areas lack proper sanitation. Then calculate the cost of a fix.

For my money, no matter how hard the times are for government revenue, it's unacceptable in a rich nation like ours to have people living in filth. The first step toward solving the problem is to define and quantify it. □



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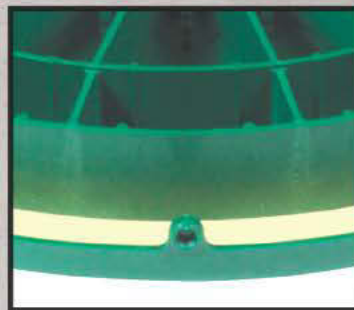
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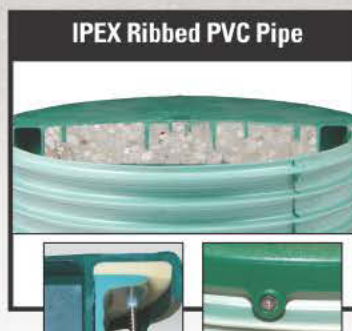
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System design is crucial for Jim Hanna, left, shown with operator Matt Gerald. New Hampshire's severe slopes and rocky soils make conventional systems more the exception than the rule. (Photography by Jeff Dachowski)

# Onsite ARTIST

J.D. Hanna Excavating creates effective systems, on time and on budget, even on sites challenged with the presence of New Hampshire granite

By Gil Longwell

Doing the best he can in every situation, on every job site and in all of life – that's what drives Jim Hanna, owner of J.D. Hanna Excavating, from one success to another.

Neither technology nor equipment makes Hanna successful. Instead, it's his drive that inspires his employees to achieve great outcomes. Attention to detail and attentiveness to changing markets, new circumstances

and emerging technologies are other attributes Hanna nurtures in himself and in others.

Based in Warner, N.H., about 85 miles northwest of Boston, Hanna chooses jobs carefully. "Most jobs are within about 50 miles of Warner, but as fuel prices rise and returns are limited, I find I am more selective," he says. "On the other hand, I will follow a good client." In the past, he has worked jobs in Massachusetts, Vermont, Connecticut and Maine.

When working close to home, Hanna rarely installs conventional systems – site conditions prevent it. He has learned to construct mounds, often using alternative media to deal with sites on severe slopes or with rock near the surface.

## A hands-on guy

Hanna found no pride in doing paperwork in his post-college jobs, first selling farm equipment, then construction equipment. He successfully managed many salespeople across a multi-state area, but he wanted more direct connection to his accomplishments.

He remembered his teen years – he was 13 when he drove his first piece of big equipment. "I had the fever," he says. "I wanted to go work on a bulldozer, where I could reflect on life while doing something I valued."

(continued)

## J.D. Hanna Excavating, Warner, N.H.

<b>OWNER:</b>	Jim Hanna
<b>YEARS IN BUSINESS:</b>	26
<b>MARKET AREA:</b>	50-mile radius
<b>SPECIALTY:</b>	Complicated systems and constrained sites
<b>EMPLOYEES:</b>	2
<b>AFFILIATIONS:</b>	Granite State Designers and Installers Association







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After switching from sales to operation, Hanna found his work hours just as long but the work was more rewarding: “Every day I could see progress. I could see the results of my work on the ground and in the ground. It was fulfilling.”

Recently, installation jobs in his market have been declining, both in number and scope, but Hanna doesn't mind the slower pace. “It is hard to sustain a medium-size enterprise, and too easy to get big,” he says. “Downsizing is hard and, most of all, it is humbling.”

**“I had the fever. I wanted to go work on a bulldozer, where I could reflect on life while doing something I valued.”**

**Jim Hanna**

“Surprisingly, getting a contract for the excavating work on a really big job can be a letdown, too. Taking on big jobs is the easy way to get big real fast.” On those jobs, he often found himself competing with other contractors for access to his work area, staging areas, space for his job site office/truck, and even for his portable restroom. Cooperation went out the window, and if someone on the job underbid and was losing money, civility often went out, too.

### Ensuring a profit

Hanna carefully evaluates each job for profitability. Past relationships with customers bring complications. “It is hard to say ‘no’ to long-term customers, but sometimes, there is no choice,” he says. Once he has some history with customers, he can gauge how quickly they pay their bills. For all of these reasons, Hanna prefers smaller-scale jobs for individual homes.

Much of his work is repeat business that flows from long-term relationships. Past customers don't ask for competitive bids – instead, they ask for a price. Avoiding the headache and cost of preparing a bid lets Hanna trim a bit off his price.

“When I had a lot of guys, my goal was to keep them busy, keep the work moving and hopefully, the cash flowing in,” says Hanna. “Being hungry for cash flow can influence which jobs you accept.”



Hanna and Gerald use a transit to level a leach bed.

## Learning Pathways

When called to a site for a repair or replacement, Jim Hanna wants to know why the current system failed.

Things change fast in the onsite industry, making it hard to keep current with the latest regulations and industry trends. Being prepared to offer the broadest range of options to owners is essential to his success; he knows there is no single answer to fit every site.

“The Granite State Designers and Installers Association fills members’ knowledge gaps through education and speaks out on pending legislative and regulatory matters, making sure that professionals’ voices are heard where they matter most – in Concord, our state capital,” Hanna says. “After the fact, my association updates me on new enactments.”

“Even sharing news about things that do not work is a plus. Knowing about both success and failure makes me a better installer. I don’t want to repeat mistakes, whether they be mine or somebody else’s.”

“I am an avid *Onsite Installer* reader. It keeps me current on the national level. I read about what similar-size businesses are doing and consider how to incorporate their success into my enterprise.” These and other resources help make Hanna a better onsite artist.

Those jobs are often challenging. “New Hampshire is mound-minded,” says Hanna. In all his years in the business, he has installed only a few basic box-and-rocks systems. The state’s regulatory preference for advanced treatment technologies is driven by challenging site conditions, notably the rock that gave New Hampshire its nickname (the Granite State).

As site slope increases, so does the volume of sand needed in mound systems. Instead of pipe-and-aggregate mounds, Hanna sees many mounds made using Enviro-Septic pipes from Presby Environmental – a corrugated, perforated plastic pipe wrapped in geotextile fabric. Some designers specify the Geotextile Sand Filter (GSF) from Eljen Corporation – it resembles a corrugated plastic 3- by 4-foot mattress. Plastic chambers are also used.

“All of these are selected to overcome site limitations,” Hanna says. “These choices may be driven by reduced materials costs, as compared to the cost of traditional sand mound materials. Personally, I’d rather install an alternate aggregate wrapped-pipe product in a sand bed than be leveling the bed for chambers. The Eljen product is also quick and easy to install.”

Hanna considers 20 years as a reasonable system life expectancy. “Ten years or less is a sign of premature failure, and we see that too often,” he says. “It is not the technology that fails.” He attributes premature failure to poor installation, inappropriate materials that do not maximize the site’s natural attributes, undersized systems and owner misuse.

(continued)

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In New Hampshire, no matter how desirable an effluent filter at a septic tank outlet may be, the installer can simply add one if it isn't in the approved design. And not all designers include filters. This is a regulatory weakness Hanna would like to see addressed.

### **Battling weather**

Site challenges aside, the climate in New Hampshire prevents year-round work, and the winter slowdown can disrupt employer-employee relationships. Hanna and his only full-time employee, Matt Gerald, have found a nice balance that meets each party's needs. Gerald finds work in the winter sports industry to fill his income gap, and that helps Hanna avoid paying increased unemployment compensation rates.

**"Every day we work hard to keep our reputation strong. Our job site is our canvas — it is how people remember us, and how we leave it is our signature."**

**Jim Hanna**

"Matt typifies the attributes of a preferred employee," says Hanna. "He is an equipment operator and laborer, but what set him apart was his initiative to get his own State of New Hampshire installer's license before coming to work for me."

With roots in the excavation business, J.D. Hanna Excavating has a diversified equipment roster that is up to any job. The list includes a Cat 120B excavator, a Cat 257B tracked skid-steer, a Cat 416CIT backhoe, a Cat 446B backhoe, a 1993 Autocar 10-wheel dump truck, a CMI Load King 20-ton tilt-bed truck, two Ford F350 pickups, and one Ford F250, all with utility or rack bodies.

Rather than hire other installation technicians, Hanna subcontracts work to others in the business. In turn, when they need excavation services, they subcontract to him. Recently, he added a permanent, part-time bookkeeper/office manager, Debra Haywood, to the team.

### **Focused on installation**

General excavation is a major part of the business: Services range from basements to utility lines to site clearing and road building. If there is earth to be moved, a hole to be emptied or infrastructure to bury, Hanna is primed for action.

Onsite installation as a share of the work has ranged from 15 to 60 percent. At present, with the housing business still slow, it's about 20 percent,



**Hanna and Gerald check a Tuf-Tite inlet baffle (risers from Polylok).**

evenly split between new systems and replacements. He has resisted the temptation to diversify into septic tank pumping.

Hanna finds that pumping tanks creates two potential customer reactions: "If pumping solves a problem, you are a hero; if you find a problem, you are no longer appreciated. Some customers who get bad news see a scam and question the pumper's conclusions and integrity."

Still, because he needs to offer pumping services, he has built strategic relationships with selected pumpers. By taking advantage of their on-the-

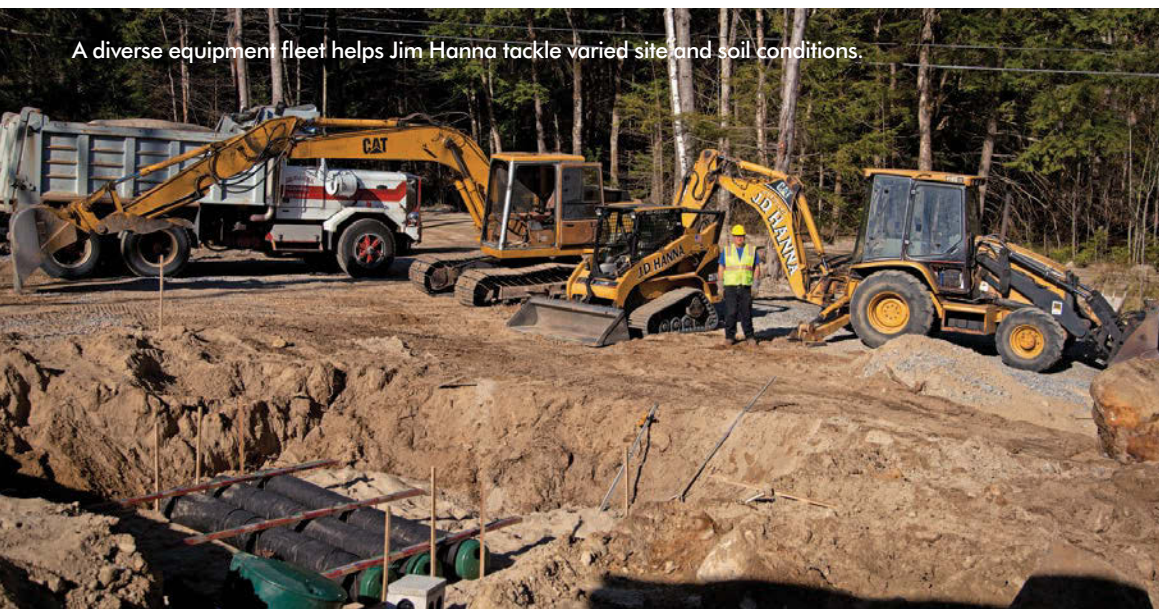
ground reconnaissance and by sharing pumping leads with them, he makes sure all parties have the best of their respective worlds, while customers have issue-focused resources available. "Designers design. Installers install. Pumpers do autopsies," says Hanna. "It is that simple."

### **Pride in craftsmanship**

Also simple – though not necessarily easy – is keeping a good reputation. "Every day we work hard to keep our reputation strong," says Hanna. Artists sign their work, and Hanna relates that signature to the appearance of his job sites. "Our job site is our canvas – it is how people remember us, and how we leave it is our signature."

*(continued)*

**A diverse equipment fleet helps Jim Hanna tackle varied site and soil conditions.**





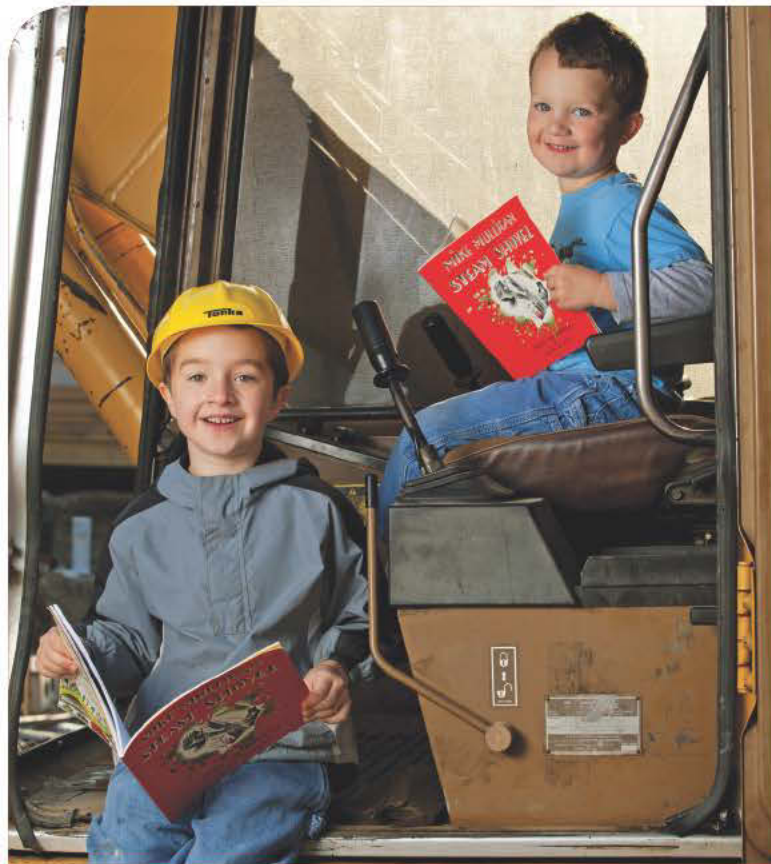
Customer relationships are also carefully crafted. Fair pricing often gets him the job, but continual communication builds the relationship. In his geography, ledge rock can always be uncovered, sometimes unexpectedly. To protect both parties, his contracts include a rock clause to address the added work and time on site that it entails. "As soon as we find rock, I am on the phone to the customer," says Hanna. "They learn what we encountered, what if any options they have, and the associated costs. It's better to surprise someone with an informative call than with an unexpectedly high yet quite legitimate bill."

Leadership brings out the best in his employees. It also nurtures a desire for employees to refine their skills and go the extra mile. In his leadership role, Hanna develops good workers into craftsmen, partly by mentoring and partly by his employees watching his interactions with all he encounters. His message is clear: "Do your best every day."

In exchange for excellence, he pays generously and pays overtime computed daily. "If you work more than eight hours, you get overtime pay," he says. Employee relationships are not one-way affairs: "I find and hire the



The J.D. Hanna team includes, from left, owner Jim Hanna, operator Matt Gerald, and office manager/bookkeeper Debra Haywood.



## Being Like Mike

When a young kid takes an interest in his machines, Jim Hanna may invite him or her to climb on board (with Mom or Dad's permission), get the feel for the machine's power, and take in the aroma of a working machine.

"When a customer has young children, I always give them a copy of *Mike Mulligan and the Steam Shovel*, a book about machines, honest productive work and the pride of accomplishing something," he says. In doing so, Hanna feels he is helping to cultivate the next generation of skilled operators.

The digital pictures of that child on his machine that he sends with his bill and the Mike Mulligan book may help a bit, too. "I send clients a calendar each year," he says. "Every time they look at it they think of me."

best help I can afford, and do all I can to learn from them. People make the difference, and that difference builds my reputation. Everybody wins."

Hanna is rightfully proud about two rare achievements for a small business: He has had no bad debt in 15 years and no litigation in 26 years.

**"We do what we said we would do. We do it for the price we said we'd do it. We do it in the time we said we'd do it."**

Jim Hanna

### Critical choice

Recessions create a lot of tension in the competitive onsite market place. "Unfortunately, recessions do not eliminate less-skilled installers, and the rise of the one-day heavy equipment rental market may actually help preserve them," Hanna says. "There are always people willing to do standard work, even if sometimes they don't recognize their work as such."

When system options are limited, installer selection is perhaps the most important choice the landowner must make. "We do what we said we would do," says Hanna. "We do it for the price we said we'd do it. We do it in the time we said we'd do it."

Hanna Excavating tries to do this on every job site, leaving behind only a well crafted canvas that he and his employees are proud to point to and claim as their own. □

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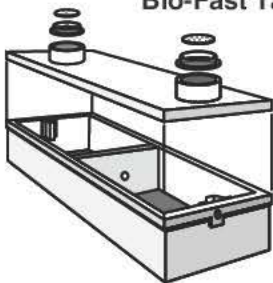
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Jim Anderson and David Gustafson are connected with the University of Minnesota onsite wastewater treatment education program. Dave is Extension Onsite Sewage Treatment Educator. Jim is former director of the university's Water Resources Center and is now an emeritus professor, as well as education program coordinator for the National Association of Wastewater Transporters. Readers are welcome to submit questions or article suggestions to Jim and Dave. Write to [ander045@umn.edu](mailto:ander045@umn.edu).

# Operational Testing for Onsite Systems

Questions about the procedure have led to development of a set of guidelines for when and how to perform the tests

By Jim Anderson, Ph.D., and David Gustafson, PE.

In 2011, we were asked what a hydraulic load test is and what kind of information it might provide. At about the same time, the National Association of Wastewater Technicians (NAWT) education committee took up the task of writing a draft standard that could be used to define the test.

This work was done as a result of questions that arose over a test we have long talked about as a part of system inspections. The concept was incorporated into the NAWT inspection program for point-of-sale real estate inspections where the level of inspections is gauged at an operational level. In our view, this level of inspection ensures that all pieces of the system are in place, are in good condition, and are operating the way they were intended.

## What about vacant homes?

A number of questions started to arise around inspecting vacant houses and evaluating the systems, sometimes after yearlong vacancies. Due to the economy and the number of foreclosures, such systems have made up a large share of those inspected during the last couple of years. Given the responses over the past year, it is hard to think everyone conducting inspections will reach a consensus on what the hydraulic load test should be, much less uniformly incorporate the information into a set of requirements.

**An operation test is conducted only on systems that are currently being used. The test as we have used it for inspections is designed first of all to make sure all of the connections in the system are taking the wastewater from the house to the tank.**

However, in the spirit of keeping the discussion current, and to the extent that the procedures discussed can help some service providers and others conducting inspections, we will discuss two types of tests at the operational level and highlight some outstanding issues. We would suggest readers either



Surface water around the tank risers is a situation where a hydraulic load test would be used to evaluate the system capacity.

respond through *Onsite Installer* magazine or go to [www.nawt.org](http://www.nawt.org) and join the discussion.

## Operation test

An operation test is conducted only on systems that are currently being used. The test as we have used it for inspections is designed first of all to make sure all of the connections in the system are taking the wastewater from the house to the tank.

To that end, we recommend that the toilets be flushed and all spigots run to verify that their outputs flow into the treatment tank. This may or may not involve the use of dyes to verify the connections. If all the water is delivered to the tank, the rest of the test can proceed; if not, there is some additional locating work to be done to identify where the water is going.

To conduct the rest of the test, water should be introduced into the tank at 3 to 4 gpm for 20 to 30 minutes. This amounts to one spigot opened, or the water can be delivered using a water meter on the end of a hose. The water level is then observed in the tank. If the level does not rise and the water moves to the next system component, the system is operating as it should.



If water backs up and the level of water rises in the tank; then further investigation is needed to determine why it is backing up, because there should be no backups in a properly operating system. Once the operation test has been performed, the tank can be pumped out to determine whether it is in sound condition and watertight.

### Hydraulic load test

The following excerpts explaining the use of the hydraulic load test are taken from the draft procedure:

A hydraulic load test should be performed when, during the course of a point-of-sale inspection, building or remodel permit application, or system evaluation for maintenance contract considerations, the following findings occur:

- The structure has been vacant for more than seven days.
- The pretreatment tank has been pumped and cleaned in the past 30 days.
- Previously diverted or new graywater sources have been introduced to the system.
- There has been any type of soil treatment area remediation within the past 30 days (e.g. chemical additives, soil fracturing, root removal).
- Initial inspection reveals that, for whatever reason, the pretreatment tank's liquid level is below the outlet pipe. (The reason for this is that if the tank is leaking, then the soil around the tank is providing additional infiltration area to the field.)
- Repairs to the soil treatment area have been made (e.g. crushed outlet line, fouled or damaged distribution box).
- A seepage pit has received less than the average daily flow during the previous 24 hours.
- The inspector learns of any significant changes to the use of the system (e.g. increased occupancy, vacations, or other changes that may affect the system).

A note here: We do not like to see seepage pits as a part of standards because we feel those systems should be considered failing and unacceptable. However, the fact is there are still lots of these systems out there in different parts of the country.

A hydraulic load test should not be performed if these conditions are present:

- The soil treatment area has been in use less than six months (new systems have no biomat to control effluent flow).
- There are any signs of soil treatment area failure (e.g. fully saturated trenches or beds based on inspection port observation, surfacing effluent, hydrophilic vegetation at the surface).

### Test basics

The test itself involves introducing a specified volume of water downstream from the septic tank to the soil treatment unit. The evaluation includes observing whether water flows back into the tank, surfaces in the yard, or is accepted by the soil.

The first two findings clearly indicate problems with the system. The water is usually introduced using a hose from an outside sillcock connected to a water meter to determine the amount of water delivered at the outlet of the septic tank.

One major area of discussion and disagreement about the test is what volume of water should be added. We hear a variety of opinions on this issue. Some suggest using the average daily flow. Others say to open up all the faucets in the house and let them run for an hour.

Before a hydraulic load test is performed, based on ponding in the soil treatment area, the inspector should determine if there has been heavy use that has been normal in the operation of the system, such as many laundry loads in a single day. If there has been heavy use in the last 24 hours, the



An example of where a hydraulic load test would not be conducted: an obvious drainfield failure.

inspector should suspend the inspection and load test and return the following day to observe the soil treatment area again, to determine if the ponding has subsided.

**Alternate procedure:** Instead of a hydraulic load test, the soil treatment area can be reinspected if the inspector verifies that the structure has been either fully occupied (maximum design) for one week, or has been partially occupied full-time for 30 days. In either case, the installation of inspection ports for monitoring is required.

### Review the procedure

The complete recommended procedure for performing a hydraulic load test is available at [www.nawt.org](http://www.nawt.org). We would appreciate feedback on it. We also want to hear from those who have run tests similar to this about where they have been conducted, why, and the results. In future articles, we will report on the comments and give our take on them. □

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# Cleaning With Care

Here's how you can help make sure customers' efforts to keep their homes germ-free do not end up damaging their onsite systems

By Sara Heger

**W**hen turning a newly installed septic system over to the owners, you can feel a bit like a doctor sending parents home with a newborn. You can give them advice on how to keep it healthy and hope for their sake that they heed it.

One key piece of advice you can give in this often germ-o-phobic world is to be careful with cleaning products, especially antibacterial formulations. If you're also in the system maintenance business, you can watch your customers' systems for symptoms of problems caused by these cleaners and other chemicals people sometimes flush.

## Signs and symptoms

Have you ever opened a septic tank and found that it looked or smelled "off"? Has a customer's effluent screen been plugging up routinely? Have you seen a newer drainfield, properly installed, get clogged?

These issues might result from a high input of cleaners, chemicals and medicines. In the septic tank, you may discover a chemical odor, high or low pH, and lack of tank stratification. This is because chemicals have killed off or depleted the bacteria on which treatment depends.

## The use of biocides, including antibacterial or disinfectant products in the home, can and does destroy good and bad bacteria in the treatment system.

Anaerobic bacteria in the septic tank produce the signature "septic" smell by breaking down organic material and releasing gases such as methane, hydrogen sulfide, carbon dioxide and ammonia. Then aerobic bacteria in the soil treatment system destroy disease-causing pathogens. These bacteria need life-sustaining temperatures, a steady supply of food, neutral pH, and freedom from exposure to toxic chemicals.

## Getting a diagnosis

The best way to start troubleshooting a septic tank is to obtain a profile using a sludge and scum measuring device. You should see three distinct layers: sludge, a clear/gray zone and scum. A lack of a scum or sludge layer may indicate emulsification caused by chemical usage.

Emulsion is the mixing of liquids and solids that are normally separated. A tank that is emulsified will cause plugging of the effluent screen in a very short time.

Next, you want to check the temperature and pH. The temperature should be above 39 degrees F for BOD removal and 50 degrees F for nitrification. The bacteria need a neutral pH. A simple pH probe will tell you if the sewage is:

- Neutral (pH 6.5 – 8)
- Acidic (pH below 6.5)
- Basic/alkaline (pH above 8)

An acidic value could indicate chemical overuse in the home. That points to possible culprits such as coffee, soda, acid-based cleaners or nitrification. If the reading is basic, ammonia-based cleaners or lye may be the cause.

Other issues that affect tank performance are variable flow patterns and lack of maintenance. If the tank is working properly it will take out approximately 50 percent of the BOD5 and TSS. If not, BOD and TSS will likely overload the advanced treatment unit or soil treatment system downstream, possibly causing an excessive buildup of the biomat that can eventually lead to surfacing of effluent.

## Looking deeper

The next step is a homeowner survey to determine what is going down the drain. You are looking for cleaners, sanitizers, disinfectants and antibacterial agents – anything that might kill the bugs. When looking at products in the homeowner's cabinets, there are three label indications you might see:

- **DANGER** means the chemical will kill the bacteria and should be used very seldom or, better still, eliminated.
- **WARNING** means the product should have minimal impact on the system but should be used sparingly.
- **CAUTION** typically means the product will have little effect and can be used in normal amounts.

The use of biocides, including antibacterial or disinfectant products in the home, can and does destroy good and bad bacteria in the treatment system. Using normal use amounts of these products will destroy some beneficial bacteria, but the population will remain sufficient and will recover quickly enough so that significant treatment problems do not occur.

On the other hand, excessive use of these products can cause significant and even total destruction of the bacterial population. More research is needed to determine what amounts are “excessive” and which products are more or less harmful to systems.

### Total impact

Typically, the use of a single product or single application will not cause major problems, but the cumulative effect of many products throughout the home may do damage. For example, high concentrations of chemicals can kill or retard the growth of the bacteria in the septic tank, advanced treatment unit and drainfield. If the bacteria are destroyed, solids accumulate in the tank much faster and can create problems in the soil treatment area.

Pharmaceuticals also come into play. The human body does not completely metabolize medications, so they enter the septic system through body wastes. Certain medications may cause premature septic system failure. What are these products we are talking about? They include:

Product	Potential Problem
Antibacterial hand soaps	<b>Kills bacteria</b>
Automatic toilet bowl cleaners	
Bath and body oils	
Disinfectants (ammonia, chlorine, bleach, peroxide)	
Laundry soap with bleach	
Antibiotics, chemotherapy agents, other prescription or over-the-counter medications	
Solvents, paints, antifreeze	<b>Emulsifies</b>
Degreasers	
Floor wax	
Floor stripping agents	<b>Kills bacteria and emulsifies</b>
Drain cleaner	
Liquid fabric softener	
Tub, tile and shower cleaners	

### Steps you can take

If you find a system has been harmed by chemical inputs, there are a number of steps you can take as a professional advisor and service provider. If the problem was likely caused by a one-time shock load, you can simply monitor the septic tank and see if it comes back, or clean out the tank and start over if the issue persists. If the issue is more long-term, there are a number of things you can recommend or do to protect the septic system:

- Educate the system users about how their use of chemicals is potentially impacting the system. Advise them not to flush leftover medications. Some pharmacies will dispose of unused medications, and many communities have “take-back” programs.
- Advise the occupants to minimize the use of antibacterial soap, disinfectant cleaners and bleach.
- Eliminate all nonsewage sources of water into the system, including water treatment device backwash water, groundwater and surface

water. Advise the occupants to space out water usage to provide more consistent flow and longer detention time.

- Monitor the system’s sludge and scum levels.
- For commercial systems, consider isolating toxic waste streams, such as from janitorial sinks and drains, into a holding tank.
- Increased system maintenance may be required, particularly with certain strong medications, such as chemotherapy drugs. The tank may have to be pumped more often to remove solids that accumulate rapidly due to loss of beneficial bacteria.
- Take samples of COD, BOD5 and TSS. Compare the COD values versus the BOD5. If COD is significantly higher than BOD5 (more than double) this may indicate a high chemical oxidation of cleaners, medicines and chemicals. You may also consider having the laboratory run BOD5 at various dilutions. If high levels of biocides are present, there will be no BOD5 demand at lower dilutions, but at higher dilutions where biocide concentrations are lower, a BOD5 demand will exist.
- If the septic tank gets too toxic, it may be necessary to use the tank as a holding tank during a prescribed treatment.
- Fill the septic tank with clean water after pumping to dilute the concentrations of the medicines at the restart of the system.
- If the system has no effluent screen, add one. The screen will need to be cleaned frequently if the septic tank is upset. An alarm is a critical part of an effluent filter installation, as it will indicate when the filter needs to be cleaned.
- Consider installing additional septic tanks or a pretreatment device as possible design changes that could further help settle out or break down some of the constituents.

### Use an additive?

All of these practices work toward preventing the loss of beneficial bacteria throughout the septic system. Whether commercial additives help is a matter of debate. Further research is needed on the effectiveness of additives (bacterial starters and feeders, enzymes, cleaners). However, no additive is a substitute for proper system care and maintenance.

Knowing the potential impacts of household products and medicines can help you get new septic system owners off to a good start, and help owners of existing systems improve performance and extend service life. □

### ABOUT THE AUTHOR

Sara Heger is an engineer and educator with the University of Minnesota Water Resource Center, Onsite Sewage Treatment Program. She can be reached at sheger@umn.edu.



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# It Takes a Little Touch

NOWRA Roe-D-Hoe winners find skills developed on the job help them in competition – and vice versa

By Pete Littferski

**C**harles Webb, grand champion of the 2012 NOWRA National Backhoe Roe-D-Hoe at the Pumper & Cleaner Expo in Indianapolis, says the solitary nature of his job might have something to do with his skills at the controls of a backhoe.

Webb, who won a trip to the national contest when he was crowned the champion of the Delaware Onsite Water Recycling Association (DOWRA) state Roe-D-Hoe, often uses his own equipment for more than just moving dirt – when alone he saves time with some tricks he has picked up over the years.

**“Instead of getting on and off the machine to do things, you learn to let the machine do the work. You lift things, you move things or you slide them out of the way.”**

Charles Webb

Webb and other top finishers in the national Roe-D-Hoe drew some parallels between the skills needed for backhoe “golf” and “bowling” and the touch it takes to be an effective operator in the field.

## Being creative

“Instead of getting on and off the machine to do things, you learn to let the machine do the work,” says Webb, 50. “You lift things, you move things or you slide them out of the way.” Although his business, R. Webb Excavating in Hockessin, has a mini excavator in its fleet, Webb still had to make some major adjustments for the national competition.

“Being 6-foot-5 and trying to get into that little machine was a challenge,” he says. Webb also had to adjust to the joystick controls on the IHI/Compact Excavator machine, noting that he has worked on machines with pilot-style controls for at least the past 15 years.

Runner-up Mike Smallwood of Smallwood Excavating in Hamilton, Ohio, had experience as his greatest asset going into the competition. Now 35, he says that when other kids might have been inside tweaking the joysticks on video games, he was down at the family pond honing his eye-hand coordination on excavating equipment.

“I grew up doing this kind of work,” he says. “My father is in the business and my grandfather was in the business. Basically, I’ve been doing it all my life.” Although his experience comes from operating full-size equipment,



Charles Webb at the controls during the NOWRA Roe-D-Hoe at the 2012 Pumper & Cleaner Expo.

Smallwood found it fairly easy to adjust to the mini machine used at the Roe-D-Hoe.

## Takes touch

His only concern was that the machine was a bit touchy. “If you missed the bowling pin a hair, it was hard to move over to it without going past the eyebolt,” he says. “But it was fair for everybody. We all had the same challenge.”

The 2012 Roe-D-Hoe was Smallwood’s second go-around. He was watching the 2010 competition two years ago when his father talked him into entering it on the spot. Though just a rookie, he also took second place that year.

Smallwood says good excavators develop the skills in the field that make for good competitors in the Roe-D-Hoe. “If you’re able to feel a rock or feel a cable and you can react quickly, you’re going to avoid a lot of problems on the job,” he says. “You just have to get a sense of things like the angle of the bucket and the sound it’s making.”

Given those criteria, Smallwood may be lucky his father didn’t enter the competition. Once on a job, “My dad stopped and said, ‘I can feel a phone line.’ We looked down in the hole and he was right.” Although Smallwood’s main motivator was competitive pride, he was pleased with the \$300 cash prize for second place: “I didn’t even know there was a cash prize this time.”

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### Starting young

Early access to excavating equipment was also an asset for third-place finisher Ryan Bassett, who earned a trip to the nationals when he won the Iowa state championship. At 27, Bassett was the youngest prize winner, but he has run machines since he was 10 years old.

Bassett, owner of Bassett Excavating in Knoxville, Tenn., says, "(The competition) definitely tests your finesse and how quickly you can adapt to a different machine."

Acknowledging a degree of pressure at the Roe-D-Hoe with a small crowd watching and cheering, Bassett notes, "I dig around major utilities every day. A guy really has to be careful because you don't want to cause any damage or get anyone hurt. But it's a confidence thing and you learn to do the job safely."

The NOWRA competition may have been Bassett's last go-around: "I've been there and done that. Now I'll let someone else have the opportunity. It was a great experience and other people should enjoy it, too."

### First time's the charm

Fourth place nationals finisher Mark Schairer of Campbellsport, Wis., went to the Wisconsin Onsite Water Recycling Association Conference in January and saw the Roe-D-Hoe competition for the first time. He entered "on a whim."

"I never practiced — never did anything like it," he says. Schairer, 33, found concentration was the key to success — a lesson he learned in his first try at the state competition.

"The first time I tried it, I wasn't first, but the guy I came with was ahead so I decided to go again," he says. Patience was a virtue for Schairer, who learned to let the twirling golf ball settle down against the traffic cone before trying to place it on top of the target. His persistence paid off, and he bumped his buddy, Nick Laudolff, out of the lead in the state contest.

The win earned Schairer a trophy and a trip to the Expo for the nationals — and he took his friend Laudolff with him. It sounds as if the two friends are psyching themselves up for a rematch: "We're definitely coming back next year," Schairer says.

**"If you're able to feel a rock or feel a cable and you can react quickly, you're going to avoid a lot of problems on the job. You just have to get a sense of things like the angle of the bucket and the sound it's making."**

Mike Smallwood

### Friendly rivals

Smallwood and Webb agree that the Roe-D-Hoe was a good place to meet new friends.

While all the contestants were working hard to set the low times, "All the guys there were very supportive," Smallwood says. "They'd cheer the other guys, too. It's a friendly competition."

Webb was a little disappointed that he didn't get to take the gaudy wrestling-style championship belt home with him after winning, but observes, "It was so heavy, I'm not sure I'd want to wear it much anyway."

Webb and wife Laura quickly made good use of part of the \$1,000 first prize: They took Kansas state champion Joe Seiwert and his wife out to lunch to celebrate after befriending them during the competition. Webb's plans for the future competitions depend on DOWRA: "If the state still has the event, I'll definitely enter." □

# King of the Road

A decentralized system with recirculating trickling filter and drip dispersal provides reliable treatment for a rural community in eastern Tennessee

By **Scottie Dayton**

**W**astewater erupting from drainfields serving 33 homes, a church, and a cabin rental office along King Branch Road in Sevier County, Tenn., flowed into a small mountain stream paralleling the road.

The state Department of Environment and Conservation banned recreational activities and fishing on the Little Pigeon River below its juncture with the stream after finding extreme levels of fecal bacteria in the water. The river is a tourist attraction.

The county Environmental Health Department and Southeast Environmental Engineering in Knoxville explored decentralized solutions. “Funding and permitting were the greatest challenges,” says designer Michael Hines, P.E., and the company’s founding principal. “At one point, it appeared that an act of Congress might be required to cross a corner of the National Park Service’s property, but it all finally came together in 2007.”

The decentralized system has a septic tank effluent pumping (STEP) system, a force main, a primary settling tank, a recirculating trickling biofilter, a dose tank, disinfection and drip dispersal.

## Site conditions

Soils are 24 to 35 inches of Ranger/Junaluska sandy silt above bedrock. The area, part of the Great Smoky Mountains, has steep, heavily forested slopes bisected by numerous small streams. Residential lots are small.

## System components

Based on analysis of expected contributors to the system, Hines designed the system to handle 11,000 gpd. Major components are:

- 28 1,000-gallon concrete STEP tanks. All tanks from C.R. Barger & Sons in Lenoir City, Tenn., have concentric pump vaults, integral 24-inch riser rings, and rubber inlet and outlet boots.
- Five 1,500-gallon concrete STEP tanks.
- 33 1/2 hp 10 gpm high-head turbine STEP pumps from AY McDonald.
- 5,650 feet of 4-inch SDR11 HDPE force main.
- 5,000-gallon primary settling tank.
- 11,000-gallon Model 30/24/2300 Bioclere recirculating trickling filter with clarifier from Aquapoint, an OBEH Company.
- 3,000-gallon dose tank with dual 1 hp, 30 gpm high-head AY McDonald turbine pumps.
- Arkal 2-inch x 2 Spin Klin disc filter supplied by JNM Technologies, Inc., Bryan, Texas.

(continued)



Workers from C.R. Barger & Sons observe as a crane operator sets the 17-foot-high trickling filter. (Photos courtesy of Southeast Environmental Engineering)

## SYSTEM PROFILE

<b>Location:</b>	Sevier County, Tenn.
<b>Facility served:</b>	Mountain community
<b>Designer:</b>	Michael Hines, P.E., Southeast Environmental Engineering
<b>Installer:</b>	Mickey Barger, C.R. Barger & Sons, Harriman, Tenn.
<b>Site conditions:</b>	Ranger/Junaluska sandy silt 24 to 35 inches above bedrock
<b>Type of system:</b>	STEP tanks, Biodere trickling filter, drip dispersal
<b>Hydraulic capacity:</b>	11,000 gpd



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Jim Magill and Johnny Gautreaux from C.R. Barger & Sons install one of two 1 hp, 30 gpm high-head AY McDonald turbine pumps in a concentric vault to dose the drip field.

### Installation

Project manager Mickey Barger from C.R. Barger & Sons oversaw the sewer and onsite crews. “Sandstone is horribly hard, and shale is as bad or worse,” he says. “To lay more than a mile of force main, my six guys needed a large rock trencher with stinger to dig the ditch alongside the road.”

Installing the new septic tanks with cleanouts went faster because workers often used the original holes after ripping out the existing tanks. “They were usually in the one location that had enough soil to set a tank,” says Barger. “In some places, we installed lowboy tanks to avoid hammering out more rock

with large power hammers attached to tracked excavators.”

The onsite crew cut down the point of a ridge in a mountain for the treatment site. “We had to stop on the road, then reverse up a 30 to 45 percent sloped access road because there was no room at the top to turn around and drive out,” says Barger.

It took three days to excavate the holes for the recirculation, treatment, and dose tanks, set in series and bedded on 6 inches of gravel. To maintain gravity flow, the last two holes were 15 feet deep.

Workers placed a 4-inch-thick, 8-foot-square precast concrete pad on top of the gravel for the 17-foot-high treatment unit, which protruded 2 feet above grade. They set the conical part on the pad, then chained the unit to eyebolts in the concrete before backfilling with No. 57 gravel up to the cylindrical portion. The remaining backfill was soil. All tank inlets and outlets were bedded with gravel to avoid cracking or dislocating the pipes.



- Dual 40 gpm Sanitron UV units in series from Atlantic Ultraviolet.
- 8,300 feet of Netafim Subsurface Drip Dispersal Tubing.
- Drip programmable logic controller with remote telemetry from Adenus Technologies; STEP control panels from Tennessee Pump and Controls.

### System operation

Wastewater flows through 4-inch PVC laterals to the septic tanks, then is pumped through 1.25-inch HDPE pipes to the force main. The force main discharges to the primary settling tank at the treatment site. Effluent in the tank flows to the trickling filter, where it is pumped to the top and sprinkled over packed plastic media.

**“To lay more than a mile of force main, my six guys needed a large rock trencher with stinger to dig the ditch alongside the road.”**

**Mickey Barger**

After effluent trickles through the media to the clarifier at the bottom, a pump recirculates it. Effluent flowing into the treatment unit displaces an equal amount of liquid in the clarifier, sending it by gravity to the dose tank. Each hour, a pump in the clarifier runs for two minutes, sucking up and discharging settled solids to the primary settling tank for additional digestion.

Every 30 minutes, alternating pumps in the dose tank run for 15 minutes, sending 600 gallons through 100-micron disc filters and UV disinfection to the drip field. The field has two 35,000-square-foot zones, each with 500 feet of tubing in loops on 10-foot centers and orifices spaced 12 inches apart.

The pressure-compensated emitters drip at 0.61 gallons per hour. “We try to keep the pressure less than 45 psi to avoid expansion stress on the tubing and potential failure of insert fittings,” says Hines.

Crews needed a large rock trencher with stinger to dig the ditch alongside the road for the force main.





Engineer Adam Smith from Southeast Environmental Engineering wires the drip system's programmable logic controller with remote telemetry from Adenus Technologies.

The crew installed the drip field above the treatment site on 1.5 wooded acres. They cut a ditch up the mountain, installed the dosing header with a 2-inch solenoid valve at the bottom of each zone, then dragged the tubing through the forest, laying it on the contour while nestling it against shrubs, trees or rocks.

"A return header with solenoid valve at the bottom of the hill allows us to backflush the lines once a week," says Hines. "A computer runs all the operations." The installation took a year.

### Maintenance

Tennessee Wastewater Systems owns and operates the system. Southeast Environmental Engineering inspects the treatment site twice a month. "Animals gnaw on the tubing, and we fix the leaks," says Hines. "We also clean the UV sleeves, check pump performance, maintain the biological process control, and provide maintenance." Solids in the primary settling tank are checked annually and pumped when necessary. ■

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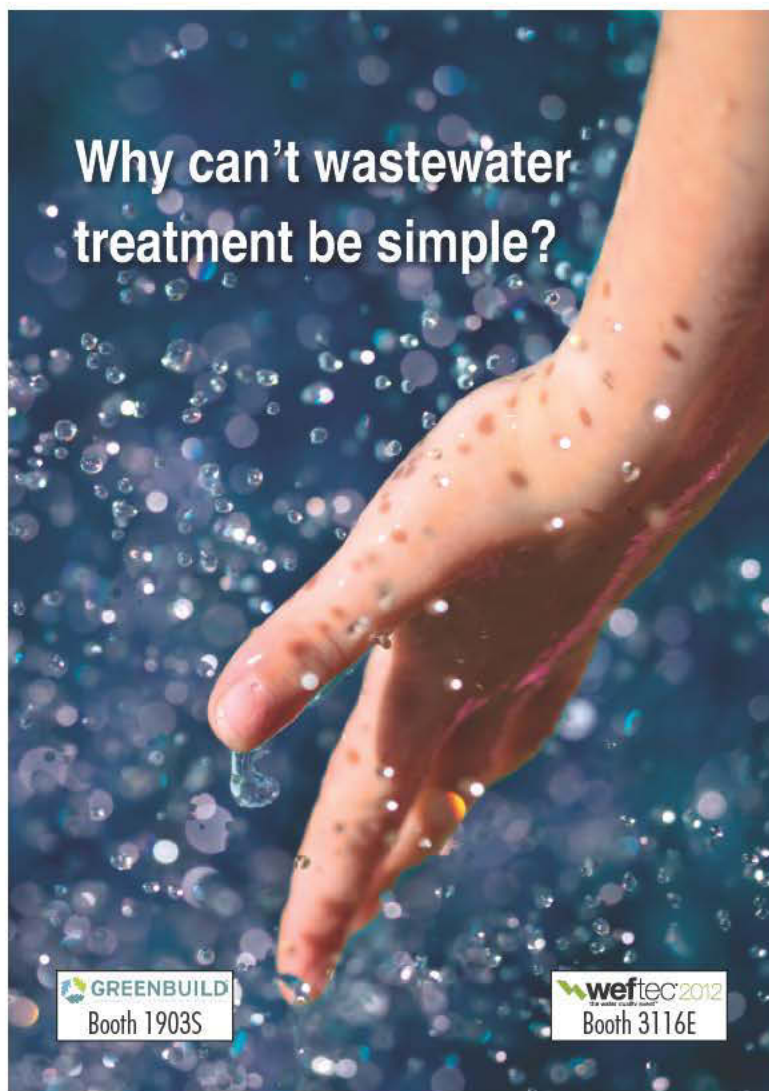
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**ABOUT THE AUTHOR**

Eric Casey is the executive director of the National Onsite Wastewater Recycling Association. For more information, visit [www.nowra.org](http://www.nowra.org) or call 800/966-2942.

# Hold Your Own?

Here's how you can arrange a Roe-D-Hoe backhoe skills competition for members of your state onsite association

By Eric Casey

**T**he popularity of the NOWRA National Backhoe Roe-D-Hoe has generated a host of inquiries from state onsite organizations that want to hold similar competitions at their annual conferences or other events.

While it is not that difficult to take on such an event, there are a number of steps involved. To help avoid pitfalls, NOWRA has developed a Roe-D-Hoe kit available to state affiliates at no cost (and at only a modest cost to non-affiliated organizations). The kit contains detailed instructions on rules and event hosting, customized sign-up sheets, game equipment, scoring software and other items.

For organizations that follow the officially sanctioned Roe-D-Hoe format, the state champion is automatically entered in the finals of the national competition, which lately has been held at the annual Pumper & Cleaner Environmental Expo. In both 2011 and 2012, the national champions were first the champions in their own states.

## Step by step

If you are interested in holding a Roe-D-Hoe event, here are the steps involved in putting on the competition:

**Equipment.** While it is relatively easy to secure a gasoline- or diesel-fueled backhoe, that means the competition must be held outdoors. In NOWRA's experience, holding the competition inside the exhibit hall generates far greater interest and is very effective at driving traffic into the hall. Typically, this means using an electric backhoe, which can be difficult to locate. NOWRA has contacts that can be helpful in finding one.

**Games.** It is usually best to offer more than one game to measure contestants' ability to operate the backhoe quickly and precisely. NOWRA's competition typically involves at least two of three games:

- **Basketball** – Three miniature basketballs rest on traffic cones. The operator must scoop each one up and drop it through a basketball hoop.
- **Golf** – A golf ball is attached by a string to a tooth of the excavator bucket. The operator must place the golf ball so that it rests on the top of a traffic cone.
- **Bowling** – Three bowling pins are used, each with an eyebolt affixed to the top. Each pin rests inside a piece of plastic pipe so that the top of the pin sticks out. An extension is added to an excavator bucket tooth. The operator must thread the bucket extension through the eyebolt, lift each pin out of the pipe and deposit it into a similar pipe on the other side of the machine.

Other games may be played, as long as they are sufficiently challenging.

**Rules.** The rules need to be printed and distributed in advance. Items to address in the rules include how each game should be played, tiebreakers, disqualification criteria, and how the winner will be determined.

**Entry/liability release forms.** Each participant should sign a form releasing your organization from all liability in case of an accident. It's a good idea to have an attorney review your release/waiver statement. You should require participants to fill out the form in full and sign and date the release statement before they participate.

**Entry form and fees.** For the NOWRA Roe-D-Hoe, contestants typically pay \$5 per attempt at the games. Many contestants make multiple attempts to get the best possible time.

**Holding the competition inside the exhibit hall generates far greater interest and is very effective at driving traffic into the hall. Typically, this means using an electric backhoe, which can be difficult to locate. NOWRA has contacts that can be helpful in finding one.**

**Staffing.** At a minimum, you need three people to run the Roe-D-Hoe: an emcee, a timer, and someone to register participants.

**Other equipment.** You will want at least one stopwatch for timing contestants. You also need some type of scoreboard. NOWRA tracks scores on an Excel spreadsheet and projects the results on a screen, but a dry-erase board can work equally well.

**Marketing.** Include the event in your conference promotional materials and make repeated announcements during the meeting itself.

## It's official

NOWRA holds the trademark for the Roe-D-Hoe name. Only organizations that hold officially sanctioned events may use the name. (In case you were wondering, close variations on Roe-D-Hoe are also covered under the trademark.)

Have some fun! Give it a try. If you have questions, call NOWRA at the number above. □

By **Scottie Dayton** and **Doug Day**

"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](mailto:editor@onsiteinstaller.com).

**Maryland**

The Department of Environment proposed new onsite regulations in April to require nitrogen removal technology on new systems on land that drains to the Chesapeake Bay, Atlantic coastal bays, or other impaired waters. The proposed regulations also set minimum operation and maintenance requirements for the life of the equipment. Companies that install or maintain the equipment must complete a state course and be certified by the manufacturer. Existing systems that fail could still be replaced with conventional systems under the proposal.

The state's builders association says the required equipment is about double the cost of conventional systems. The Department of Environment estimates the cost of an advanced system to be around \$13,500.

[www.mde.state.md.us/programs/PressRoomPages/042712NRnewproposedBATreg.aspx](http://www.mde.state.md.us/programs/PressRoomPages/042712NRnewproposedBATreg.aspx)

**Hawaii**

The U.S. EPA has issued three fines totaling more than \$140,000 against companies for using large-capacity cesspools that have been banned nationwide since 2005. The EPA reports that 2,800 such cesspools have been shut down in Hawaii, but there are still 1,200 in use.

**Florida**

The Hernando County Commission was the first to opt out of routine septic system inspections. Florida law exempts counties from such inspections if they don't have first-magnitude springs (flows exceeding 64.6 mgd). The 19 counties with such must conduct limited inspections unless they opt out by Jan. 1, 2013.

The governor approved the appropriation of \$1.5 million for phases 2 and 3 of the Nitrogen Reduction Project, an ongoing study to develop alternative, cost-effective, science-based passive nitrogen reduction strategies that can be retrofitted to conventional septic tanks. The money will allow the completion of field testing.

**Pennsylvania**

Upper Salford Township officials announced they did not approve a plan for a centralized, publicly owned wastewater system, stating it would

be too difficult to implement. The township's Sewage Facilities Plan names onsite systems as the permitted means of wastewater disposal.

**Virginia**

New septic system regulations enable property owners to install alternative systems using peat, plastic or sand because they require less space than conventional drainfields. The changes also removed a requirement that alternative systems have an emergency drainfield in case of failure. To meet the Chesapeake Bay total maximum daily loads, the state Department of Health proposed that all new onsite systems must use alternative technology because they remove nitrogen. □

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# Distribution Equipment and Systems

By Briana Jones

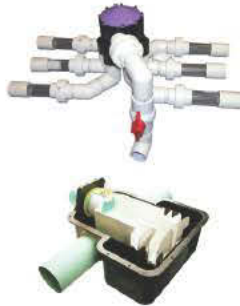
## Gravelless system

**GEO-flow** corrugated HDP pipe from **Advanced Drainage Systems** is an advanced gravelless pipe distribution system for equal distribution. The design promotes an oxygen-rich environment for increased biomat activity. With polypropylene grid and geotextile wrapping, the system increases effluent dispersal performance. Its flexibility makes it well designed for contoured applications. Because the system is gravelless and has a lightweight design, it is easily delivered and installed in areas where conventional pipe and gravel systems would be difficult to use. It requires few people, little time and minimal heavy equipment to install. 800/821-6710; [www.ads-pipe.com](http://www.ads-pipe.com).



## Splitter and valve

The **Tru-Flow** splitter from **Clarus Environmental** equally divides effluent under gravity up to five ways while allowing operators to clean and adjust the flow without digging. The Spider Valve pressure manifold can be configured to properly split flows to laterals of different lengths on odd-shaped lots. Automatic multizone valve assemblies make large pressure-dosed systems manageable by dividing a system into larger, more convenient zones. 800/928-7867; [www.clarusenvironmental.com](http://www.clarusenvironmental.com).



## Antisiphon dripline

**Geoflow's** antisiphon dripper allows design of a dispersal field for any landscape. The dripper is slow to drain water when the pump turns off. This makes it less sensitive to vacuum than standard pressure-compensating driplines, and less dependent on airvents. The dripline provides protection against root intrusion with **ROOTGUARD** molded into each emitter. A turquoise Geoshield layer protects against biological buildup. 800/828-3388; [www.geoflow.com](http://www.geoflow.com).



## S pumps

**S pumps** from **Grundfos Pumps** are designed for transfer of unscreened raw sewage, transfer of raw water, and pumping of water containing sludge. The S-impeller does not compromise free passage or hydraulic efficiency. Greater free passage means better solids handling and greater non-clogging capabilities. The design provides long life and low maintenance costs.



Features include a wide range, SmartTrim, operation with or without cooling jacket, submerged or dry installation, channel and vortex impellers, built-in motor protection, SmartSeal, large free passage and S-tube impeller. 800/921-7867; [www.grundfos.us](http://www.grundfos.us).

## Geosynthetic aggregate

**EZflow** by **Infiltrator** is an environmentally friendly modular engineered geosynthetic aggregate replacement for traditional stone and pipe drainfields. The system improves drainfield performance by eliminating the fines, compaction and embedment associated with crushed stone. The systems are effective for shallow applications when high water tables, poor soils, variable terrain or other factors prohibit installing a traditional trench system.



The lightweight systems are flexible and easy to install and can be contoured around trees or on sloping sites. The technology is suited for system repairs. Pre-assembled units include a 3- or 4-inch perforated pipe surrounded by aggregate and held in place with durable high-strength netting. The systems come in 5- and 10-foot lengths and in diameters of 7, 9, 10, 12, 13 or 14 inches. 800/221-4436; [www.infiltratorsystems.com](http://www.infiltratorsystems.com).

## Dripfield headworks

The **Drip Irrigation Headworks** package from **Jet Inc.** is designed as a direct-mount device on an effluent pump tank that will filter effluent discharge while controlling pressure to the dripfield. It is available for auto or manual flush. The package contains a 1.5-inch vortex screen filter and pre-installed pressure gauges to monitor pressure drop across the filter component and regulate pressure to the dripfield.



Designed for use with the company's drip system **Float Tree**, the package mounts onto an existing 24-inch Polylok riser for easy access to the pump, float tree, integrated vortex filter and controls. An optional flowmeter package and pressure relief valve are also available to meet site-specific and regulatory criteria. 800/321-6960; [www.jetincorp.com](http://www.jetincorp.com).

## Low-volume dripperline

**Bioline** from **Netafim** is purple polyethylene, low-volume dripperline designed for use with onsite wastewater systems ranging from domestic septic strength to secondary-treated effluent. Each dripper is debris resistant, continuous self-flushing and pressure compensating. The drippers deliver a precise application rate into the soil over a broad pressure range and have an antibacterial impregnated into them to prevent microbial slime buildup. The dripline does not require



special handling or storage, and no chemicals are required to protect against root intrusion.

Available in three flow rates and several dripper spacings, the product is designed for virtually any soil type and does not need expensive equipment to install. Its ability to precisely deliver the effluent without the imbalance of trench and pipe layouts make it well suited for environmentally friendly areas, tight soils, slopes, odd-shaped areas and for those wanting to use the effluent for beneficial reuse. 888/638-2346; [www.netafimusa.com/wastewater](http://www.netafimusa.com/wastewater).

### Rockless drainfield system

The **Multi-Pipe (MPS) Rockless drainfield system** from **Plastic Tubing Industries** offers an alternative to gravel, chambers and foam cubes. The technology uses a system of corrugated pipes to replace voided areas within a gravel system. The system provides a reduced footprint, lower profile, and increased transpiration and evapotranspiration area. All configurations are constructed with recycled materials in the U.S. 407/298-5121; [www.pti-pipe.com](http://www.pti-pipe.com).



### Drain boxes

**Polylok 12- and 20-inch drain boxes** are designed for large applications including golf courses and are suitable for homes. The boxes accept 2-, 3-, 4- and 6-inch pipe and also accept Polylok risers. The units are easy to install, accept corrugated pipe, can be used with solid cover or grade, allow pipe to be installed at various heights, and include four stabilizing feet with every 12-inch box. The boxes can be used as rain drains for gutters, driveways and subsurface drainage, and also as distribution boxes or drop boxes for septic systems. 877/765-9565; [www.polylok.com](http://www.polylok.com).



### Drip tubing

**Small-diameter drip tubing** from **Quanics Inc.** is flexible and easy to install and requires minimal site disturbance. Shallow placement of 6 inches deep with no additional cover reduces the need for topsoil. The tubing is available as pressure compensating and non-compensating. Bactericide is incorporated into the inner lining of the dripline to prevent bacteria from forming and eliminates the need to scour the tubing. Tubing and dripline emitters include ROOTGUARD to prevent roots from clogging drip emitters. 877/782-6427; [www.quanics.net](http://www.quanics.net).



### Effluent pump

The **Bullet high-head effluent pump** from **Septic Services, Inc.** is a midsection double-screened pump designed for high-pressure applications including pumping liquids and filtered effluent to an irrigation or mound system at a long distance. Constructed with a corrosion-resistant stainless steel outer shell, the 4-inch-diameter pumps have a 1/2 hp oil-filled, 120-volt, continuous-duty submersible motor and a 15-foot, two-wire, one-phase ground cord. The BP-12 has an output of 12 gpm with an NPT 1 1/4-inch discharge. The BP-20 has an output of 20 gpm with an NPT of 1 1/4-inch discharge. The units measure 4 inches in diameter by 34 inches and weigh 25 pounds. 800/536-5564; [www.septicsserv.com/store](http://www.septicsserv.com/store).



### Compact pump

The **Compact pump series** from **Thompson Pump** is available in diesel-drive portable sizes of 4 and 6 inches. The lightweight system offers a small size, few parts and low maintenance. If an onsite plant is being upgraded or requires maintenance and fluids (treated or untreated) need to be moved, the pumps provide temporary pump power to move the fluid.



The series includes the Enviroprime system, which keeps pumpage from discharging into the environment. The series is available with automatic start/stop and Silent Knight sound attenuation. Pumps keep land dry while construction digs deep for laying pipes, trenches, new systems or septic tanks. 800/767-7310; [www.thompsonpump.com](http://www.thompsonpump.com).

### Distribution boxes

Strong, permanent **distribution boxes** from **Tuf-Tite** include a speed leveler in each outlet. The stable, non-corrosive boxes come in four-hole, six-hole, seven-hole and nine-hole sizes. Risers are available on the four- and seven-hole boxes. All boxes have a one-piece watertight seal that accepts 1 1/2-, 2-, 3- and 4-inch SDR35 or Schedule 40 pipe, including corrugated, for easy installation. 800/382-7009; [www.tuf-tite.com](http://www.tuf-tite.com).



### Wastewater pumps

**V-Series wastewater pumps** from **Webtrol** are designed for residential and commercial applications and feature a recessed, cast iron impeller that reduces the load on the bearing and prevents clogging. The air-filled motors offer a continuous-duty rating. To protect the motor from water, the pumps come standard with potted epoxy cord seals and double, silicon carbide mechanical seals. All motors include overload protection. The pumps are made of cast iron and stainless steel, and are available from 1/2 to 2 hp in 115V, 230V, single-phase and three-phase. 800/769-7867; [www.webtrol.com](http://www.webtrol.com).



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# Distribution Equipment and Systems

By Scottie Dayton

## Passive process has small footprint

### Problem

A failing onsite system on a small lot in Ft. Blackmore, Va., needed replacing, but shallow soils and a ledge outcrop limited the available area to a 30- by 50-foot section with 15 percent slope.

### Solution

Cliff Carson, environmental engineer at Maxim Engineering in Coeburn, specified the Advanced Enviro-Septic (AES) system from Presby Environmental. The system treats wastewater in a natural, passive process within a small footprint.



### RESULT

The system, the first of its kind in the state under new alternative regulations, saved the homeowner thousands of dollars over conventional technologies. 800/473-5298; [www.presbyenvironmental.com](http://www.presbyenvironmental.com).

## Alternative treatment enables home construction

### Problem

A residential lot in Greensboro, N.C., was inaccessible to city sewer. The owner consulted an engineering firm specializing in alternative advanced treatment designs.

### Solution

Due to limiting soils, the engineer specified Puraflo peat biofilters and the PuraDrip Perc-Rite dispersal system from Anua. The biofilters produce NSF/ANSI Standard 40 effluent. The time-dosed pressure-compensating drip tubing provides precise application of water.



### RESULT

With the onsite system approved, the property owner hired a contractor to build a three-bedroom home on the lot. 800/787-2356; [www.anua-us.com](http://www.anua-us.com).

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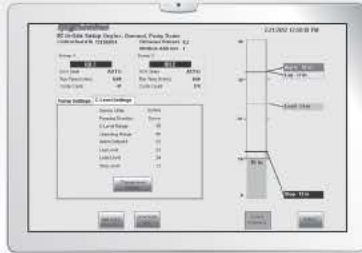
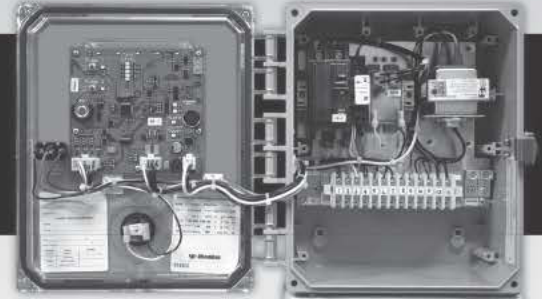
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## SJE-Rhombus duplex VFD controller

The CPN1 duplex variable-frequency drive (VFD) controller from SJE-Rhombus is designed to work with two CPN1 or two CP3R VFD control panels for constant pressure applications. The controller alternates the lead control of two control panels based on the accumulated run time of each VFD (controller must be mounted indoors). The preprogrammed controller is designed to work "out-of-the-box" to control the lag pump operation in the duplex system to maintain operating pressure under high demand. Features include run status for both lead and lag pump and lead pump indication. Lead shift hours are adjustable from 1 to 24 hours. 888/342-5753; www.sjrhombus.com. □



## Xylem offers system sizing tool

The System Syzer version 4 software tool from Bell & Gossett, a xylem brand, calculates flow rates and pressure drops in HVAC piping systems. It can be downloaded at xylem.com/esp. Features include Spanish language option, support for PVC pipe, look icons to indicate what variable is to be solved, ASHRAE 90.1 pipe sizing standards, estimated pump energy cost based on pump size, headloss calculating, library of fittings, reducers and valves and NPSHA calculator with open and closed system support.



## Premier Tech receives environmental award

Premier Tech's business unit, Premier Tech Aqua from the Environmental Technologies Group, received the Phenix de l'environnement, the highest environmental distinction award in Quebec, for its Ecoflo polyethylene ready-to-install product. The 100 percent environmentally friendly wastewater treatment system placed first in the Process, Product or Ecoresponsible Packaging category.



## Morrell, VOWRA executive director, passes away

Benny Charles Morrell, executive director of the Virginia Onsite Wastewater Recycling Association (VOWRA), passed away in August at his home in Star Tannery, Va. Morrell, age 70, came to VOWRA in Sept. 2007 after retiring approximately 18 months earlier. He worked to organize educational conferences, craft newsletters, answer phone calls and emails, along with managing the day-to-day operations of the organization. A loving husband, father, grandfather and brother, he is survived by Hazel, his wife of 48 years. □

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Contact: Andrea Barnard at [andrea@tarei.com](mailto:andrea@tarei.com)

September 20-21, 2012 - Ruidoso, NM

N-MOWA - NAWT, Contact: Jace Ensor

at 575-937-8304 or [nmowa.president@gmail.com](mailto:nmowa.president@gmail.com)

November 15-16, 2012 - Lakewood, CO

CHURCH Onsite Wastewater Consultants, Contact:

Kim Seipp (303) 622-4126 or [highplains@tds.net](mailto:highplains@tds.net)

### Installer Workshops

October 15, 2012 - Dover, DE

DOWRA Conference Contact Hollis Warren at

(302) 284-9070 or [htwarren430@aol.com](mailto:htwarren430@aol.com)

October 25-26, 2012 - Lakewood, CO

CHURCH Onsite Wastewater Consultants

Contact: Kim Seipp (303) 622-4126 or

[highplains@tds.net](mailto:highplains@tds.net)

### Operation & Maintenance

Training Certification:

September 12-13, 2012 - Mill Valley, California

O&M, Level 1 - Instructors: Mike Treinen or

Kit Rosefield - Go to [www.COWA.org](http://www.COWA.org)

November, 2012 - (TBA) California

Operation & Maintenance, Level 2

Instructors: Nick Weigel or Kit Rosefield

Go to [www.COWA.org](http://www.COWA.org)

### CEU's for NAWT Recertification

October, 2012 - Northern (TBA), CA

COWA & NAWT Science of Soils

Go to [www.COWA.org](http://www.COWA.org).

October 8-9, 2012 - Tucson, AZ

Univ. of AZ Soil & Site Evaluation

for Onsite Wastewater Systems

### NAWT Vacuum Truck Technician

September 17 & 18, 2012 - Albuquerque, NM

POWRANM - NAWT, Contact: Bill McKinstry at

(505) 989-7676 or [admin@powranm.org](mailto:admin@powranm.org)

September 19, 2012 - Ruidoso, NM

N-MOWA - NAWT, Contact: Jace Ensor at

575-937-8304 or [nmowa.president@gmail.com](mailto:nmowa.president@gmail.com)

January 7-8, 2013 - East Lansing, MI

MI & NAWT - Contact Mark Scott at (989) 275-5011

or [msscott@i2k.com](mailto:msscott@i2k.com)

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**WANTED:** Looking to acquire septic businesses in Massachusetts. All inquiries will be confidential. 508-868-7627. (PIBM)

## DRAINFIELD RESTORATION

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Hydromatic, Zoeller, Liberty, ABS, Myers, Grinder and Effluent pumps. Lift station packages and high water alarms are also available. Septic Services, Inc. [www.septicsew.com](http://www.septicsew.com), 1-800-536-5564. (IM)

## SEPTIC TRUCKS



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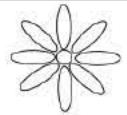
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## Georgia Association Creates CEU Classes

The Georgia Onsite Wastewater Association began providing continuing education credits at its annual conference. Vice president Matt Vinson of Vinson Septic Solutions assembled presentations. Association legislative liaison Jim Free of Infiltrator Systems assisted Vinson with logistics.

“As a former health inspector, Infiltrator representative, and septic contractor, I heard so many misinterpretations and wrong information given out over the years,” says Vinson. “I wanted to teach the regulations that are in the manual and how they tie to practices in the field.” Most classes included outdoor hands-on activities and vendors demonstrating products. The fresh air classrooms were well received.

## Minnesota Activities

The Minnesota Onsite Wastewater Association elected Lori Ende, co-owner of Ende Septic in Rogers, as its first woman president. The organization encourages member participation and seeks a diverse industrial membership. To encourage members to attend functions and voice opinions, the board proposed a new convention format with an open forum held back-to-back with the board meeting during prime time. The board also considered making the forum part of the board meeting and including panel discussions.

The Minnesota Pollution Control Agency staff traveled to 66 counties and 22 cities across the state meeting with local onsite program representatives to share information on septage storage, the new Existing System Inspection form, septic tank and treatment product registration, and standards for ultralow-flow systems.

The University of Minnesota Extension Onsite Sewage Treatment Program published a fact sheet, “Antibacterial Products in Septic Systems.” It says the cumulative effect of antibacterial soaps, cleaners and laundry bleach may destroy beneficial bacteria. Several professionals reporting little or no bacterial activity in systems said discontinuing antibacterial products restored proper treatment. Visit [www.septic.umn.edu/factsheets/antibacterialproducts](http://www.septic.umn.edu/factsheets/antibacterialproducts).

## Online Precast Septic Tank Plans

GizmoPlans.com released plans for septic tank molds designed for 300- to 3,000-gallon precast concrete tanks with up to three compartments. Plans come with detailed drawings and specifications that include tank and cover weight, inlet and outlet invert sizes, liquid levels, and interior airspace. The goal is to help precasters recover in a shaky economy by building their own molds. Plans can be downloaded from the website.

## CALENDAR OF EVENTS

### Oct. 7-9

Virginia Onsite Wastewater Recycling Association Conference and Trade Show, Williamsburg Hotel and Conference Center. 540/465-9623; [www.vowra.org](http://www.vowra.org).

### Oct. 15-16

Delaware Onsite Wastewater Recycling Association Conference and Exhibition, Dover Downs Casino and Conference Center. Call Niki Glanden at 302/359-2210, Hollis Warren at 302/284-9070, or visit [www.dowra.org](http://www.dowra.org).

## TRAINING & EDUCATION

### Training at Michigan Directors Meeting

The fall Michigan Septic Tank Association Board of Directors meeting at Williams Pumping Service in Maple City on Oct. 13 will have continuing education classes after lunch. Contact Joe Williams at 231/228-7499 or [williamspumping@cs.com](mailto:williamspumping@cs.com).

### Class for Precasting

WasteWater Education will offer an online class on Seals, Sealants, Mastics and Boots for Precast Installation on Oct. 17 from noon to 1:30 p.m. Eastern time (with an additional option of Oct. 24, same times, if necessary). The presentation will discuss how to choose, install and inspect for appropriate seals, sealants, gaskets and boots to ensure a watertight precast concrete tank. The presenter is Tim Andrews of Press-Seal Gasket Corp. Register online at [www.wastewatereducation.org](http://www.wastewatereducation.org).

### Alabama

Licensing classes are the joint effort of the Alabama Onsite Wastewater Association (AOWA) and University of West Alabama (UWA). Courses are at UWA-Livingston campus unless stated otherwise:

- Oct. 4-5 – Pumpers Class
- Oct. 10-12 – Advanced Installer I Class
- Oct. 25-26 – Continuing Education Class, Mobile
- Nov. 14-16 – Advanced Installer II Class

The first day of Continuing Education classes is for installers and the second day is for pumpers and portable restroom operators. Call the training center at 205/652-3803 or visit [www.aowatc.uwa.edu](http://www.aowatc.uwa.edu).

### Arizona

The University of Arizona Onsite Wastewater Education Program has a Soil and Site Evaluation for Onsite Systems course Oct. 8-9 in Tucson. Contact Kitt Farrell-Poe at 520/621-7221, [kittfp@ag.arizona.edu](mailto:kittfp@ag.arizona.edu) or [www.ag.arizona.edu/waterquality/onsite](http://www.ag.arizona.edu/waterquality/onsite).

### Connecticut

The Connecticut Onsite Wastewater Recycling Association (COWRA) is accepting applications for its 2013 Installer and Pumper/Cleaner courses. The Installer School is held six Thursdays, Jan. 17 to Feb. 21 (snow date of Feb. 28). Enrollees are automatically enrolled in the Pumper/Cleaner School, scheduled for Thursday, Feb. 21 (snow date of Feb. 28). Both courses are offered as preparation for the State Licensing Exam. For more information, contact Janice Cavanaugh at 860/267-1057.

### Georgia

The University of Georgia's Center for Urban Agriculture is offering Onsite Wastewater Management classes:

- Oct. 5, Dublin
- Oct. 12, Albany
- Oct. 26, Valdosta
- Nov. 2, Fulton
- Nov. 16, Brunswick

Contact the Continuing Education Center at 770/229-3477, conteduc@uga.edu or www.ugaurbanag.com.

## Iowa

The Iowa Onsite Wastewater Association has these courses:

- Oct. 26 – Educating Homeowners/How to Prepare for Future Upgrade, Grimes
- Nov. 16-17 – CIOWTS Installation Overview and Test, Newton

Contact Alice Vinsand at 515/225-1051, execdir@iowwa.com or visit www.iowwa.com.

## Minnesota

The University of Minnesota Water Resources Center has these classes:

- Oct. 2 – Soils Continuing Education, Red Wing
  - Oct. 23-26 – Advanced Design and Inspection of Onsite Systems, Part 2, Mankato
  - Nov. 28-29 – Installer Continuing Education, Brainerd
  - Nov. 29 – Pipelayer Certification, Brainerd
- Call Nick Haig at 800/322-8642 or visit www.septic.umn.edu.

## Missouri

The Missouri Smallflows Organization has these CEU courses:

- Oct. 17 – Aerated Treatment Units, St. Louis
  - Oct. 18 – Hydraulics, St. Louis
  - Nov. 13 – Troubleshooting, Liberty
  - Nov. 14 – Hydraulics, Liberty
  - Nov. 27 – Drainfields/Water Management, Springfield
  - Nov. 28 – Pumps, Panels and Electrical, Springfield
- Call Tammy Trantham at 417/739-4100 or visit www.mosmallflows.org.

## Nebraska

The University of Nebraska-Lincoln Extension has a state-approved Operations and Maintenance course on Oct. 11 in Wayne. Call the extension at 402/472-9390 or visit www.deq.state.ne.us/WasteWat.nsf/pages/OnsitePDH.

## New England

The New England Onsite Wastewater Training Center at the University of Rhode Island in Kingston has these courses:

- Oct. 4 – Bottomless Sand Filter Design and Installation
  - Oct. 11 – Functional Inspections
  - Nov. 1 – Rhode Island Designer Examination Prep
  - Nov. 8 – AutoCALCS - Automated Bottomless Sand Filter Sizing, Pump Calculations, and Support Material
  - Nov. 15 – Identifying and Managing High-Strength Wastewater
  - Nov. 29 – Regulatory Setbacks and Buffers
- Call 401/874-5950 or visit www.uri.edu/ce/wq.

## North Carolina

North Carolina Septic Tank Association has the following classes:

- Oct. 8-9 – Installer/Inspector, Hickory
  - Oct. 24-25 – Installer/Inspector, Greensboro
  - Oct. 26 – Pumper/Land Application, Greensboro
- Pumper and land application credits apply for Oct. 8 and 26. Call 336/416-3565 or visit www.ncsta.net.

## Oregon

The Chemeketa Community College in Salem has these CEU classes:

- Oct. 24 – Installer
- Nov. 7-8 – Maintenance Operator

Call 503/399-5181 or visit www.chemeketa.edu/busprofession/ccbi/customizedtraining/deq/classes.html.

## Utah

Utah State University has these On-Site Wastewater Treatment Certification renewal workshops:

- Oct. 3-4 – Level 2, Logan
- Oct. 23-25 – Level 3, Logan

Call Ivonne Harris at 435/797-3693 or visit http://uwrl.usu.edu/partnerships/training/classes.html. □

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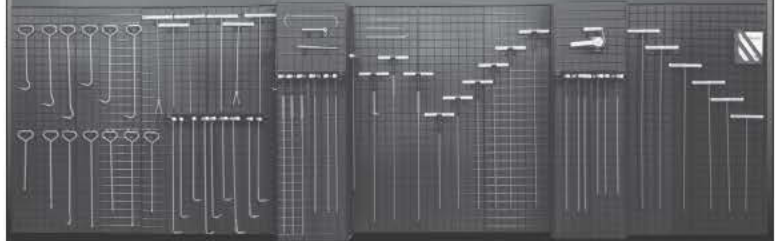


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