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Les and Stacy Harris



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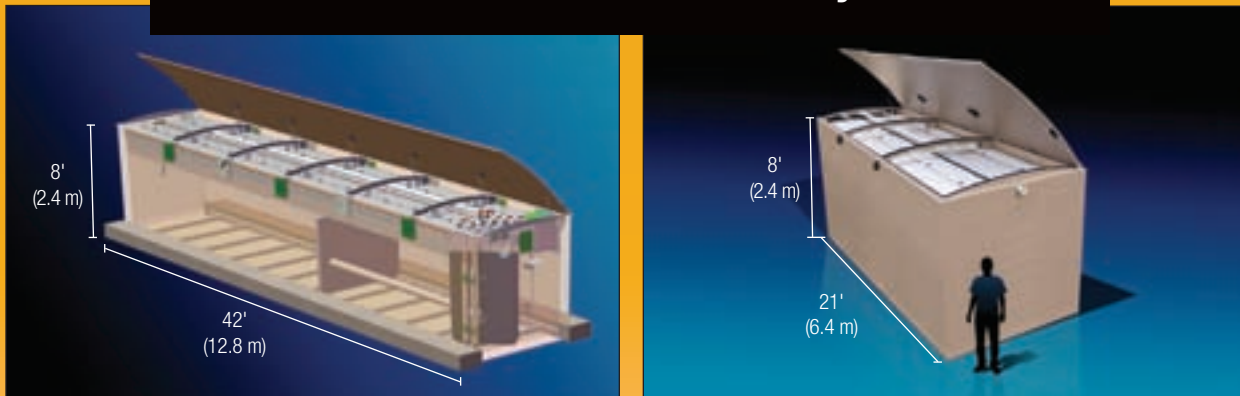
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#### New Technology/Installation Tools

- Profile: Onsite Consultant Mike Treinen, Santa Rosa, Calif.
- Product Focus: New Technology/Installation Tools
- Basic Training: Installing media filters
- System Profile: Aerobic bacterial generator with raised mound

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\* Note: Influent affects nitrification/denitrification and requires monitoring of alkalinity, oxygen, temperature, toxic inhibitors, etc.

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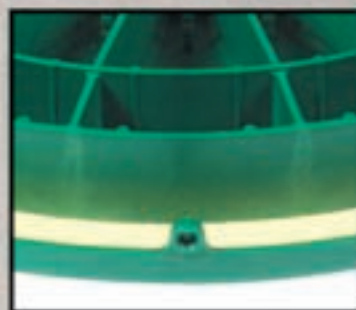
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# Fishing the Deep

If the housing market still has your business in a slump, perhaps now is a time to explore new and different service opportunities

By Ted J. Rulseh, Editor

Go to a Northern Wisconsin lake in summer and you'll see anglers in boats, casting lures or soaking bobbers near lily pad beds or brush piles near shore. That's the way they fish; a well-known guide refers to such folks as "bank beaters."

What he means is they stick to the same shoreline-based tactics all the time. Now, shoreline fishing works and can yield some nice catches. But if on a given day there are no fish in those areas, or they are there but not biting, the "bank beaters" are out of luck.

spire to dry that business up? That happened to a goodly number of onsite installers who depended heavily on new housing and felt the rug pulled out when the recession hit in 2008.

### Making adjustments

A common theme among installers we profile on our pages recently is adaptability. When housing went into a slump, they made adjustments, in some cases changing their business mix drastically.

They did it by necessity, though in a few cases without a great deal

aren't biting" in the housing sector, what might be out there in the "deeper water?"

### Where to wet a line?

What lines of business are installers looking into? Well, for one, maintenance, and not just O&M on advanced systems. Some have taken on system pumping, or if they dabbled in that service before, are getting more active with it.

The clear benefit of going into any kind of maintenance is that a customer served with an install can become a customer for life – the service creates a regular income stream that is somewhat impervious to the housing market's cycles. Of course, it means developing the skills to build customer relationships, not to mention investing in and getting to know new equipment.

Others have transitioned into more general excavation, maybe not as interesting or challenging in all cases, but a great way to keep the machinery and team members busy.

These are perhaps the obvious business expansions, but there are several other avenues available. For example, how about designing? It takes training to become a soil evaluator and system designer, but it doesn't require a four-year degree.

Learn these skills and you become more valuable and versatile.

How about system repair? A number of installers have gravitated in this direction since the market for new systems fell off. Old systems still fail, and when they do, someone has to step in to fix or replace them.

How about graduating to bigger-scale projects like commercial systems or community clusters? That could mean making contacts at engineering firms or with some of the more sophisticated designers – but these can be big jobs, well worth chasing if you can get access to the right equipment and, again, the knowledge.

### Making a choice

Other possibilities? Performing time-of-sale inspections. Hanging out your shingle as an onsite consultant and troubleshooter. Getting involved with projects in related sectors, such as stormwater management.

The point is that, if you're fishing familiar waters and not much is biting, perhaps it's time to explore the deep. You might find the fishing so much more fun and rewarding that, while you'll still enjoy probing the shorelines at times, you won't depend on them ever again. ■

**A common theme among installers we profile on our pages recently is adaptability. When housing went into a slump, they made adjustments, in some cases changing their business mix drastically.**

The remedy is to head out to deeper water and work the edges of weedbeds, the sandbars, the rock humps, the cribs and timber piles, that may be harder to find, but are more likely to produce – and may yield bigger fish.

So it can be in business. It's great to have a single specialty that you know and love and can deliver profitably and to customers' great satisfaction. But if that's all you do, what happens if conditions con-

of premeditation. The market changed, and they just followed demand where it led. They managed to keep going, and now that they have entered different markets and adopted different tools and techniques, they may never go back to the way they used to operate, even if the housing sector comes back.

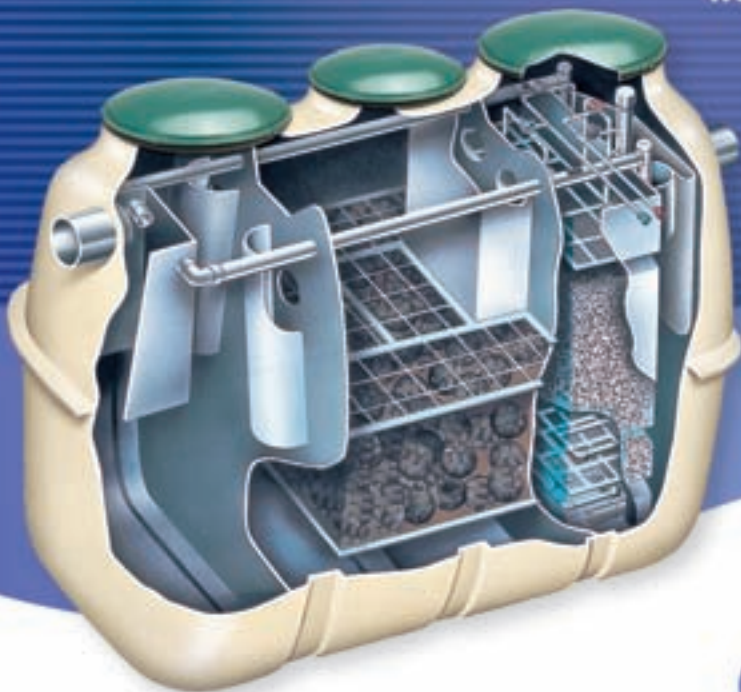
Now, what about making a conscious decision to change your approach to the market? If "the fish

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From left, Mike Tracer, Jasen Russell, Ed Ownbey and Les Harris formulate a plan to finish the installation while Stacy Harris removes the lines used to place the septic tank. (Photography by Tim Bullard)



# Bucking the Tide

Recession didn't stop Les Harris from expanding. He invested while others pulled back, and saw his business grow substantially.

By Kathy Jespersion



**Mr. Ed's Advanced Septic, LLC, Grants Pass, Ore.**

**OWNERS:**

Les and Stacy Harris

**EMPLOYEES:** 3

**SERVICE AREA:** 50-mile radius in Jackson, Josephine and Douglas counties

**SPECIALTY:** Installing systems in variable soil and site conditions

**BUSINESS MIX:** 70 percent installation, 30 percent service and repairs

**AFFILIATIONS:** NOWRA, Oregon Wastewater Association

Les Harris looks for opportunity – he doesn't wait for it to come knocking. That's the way he has done business for 35 years, and it's an attitude that has kept his company alive. In fact, when the recent recession took hold of the nation's economy, Harris' way of thinking not only saved his business – it made it thrive.

"Tough economic times can be a good thing or a bad thing," says Harris, co-owner of Mr. Ed's Advanced Septic, LLC in Grants Pass, Ore. "It just depends on how you look at it. When things were really looking bleak and I didn't know if we were going to make it, I decided to expand the business.

"I bought a pumper truck. It was a risky move. When conventional wisdom tells you to tighten your belt, spending money doesn't

and rising.

The business mix now consists of about 70 percent installation and 30 percent service, including

**"Just because the tank is backed up doesn't mean there's anything wrong with it. The real problem could be further down the line, like in the drainfield. You just have to take your time to analyze the situation and not jump to conclusions."**

Les Harris

usually make much sense. But it was a risk that paid off." It paid off in a big way: He now does more business than he ever did, even before the economic downturn. Overall growth is about 20 percent

repair. "You never know what's going to work," Harris says. "Staying in front of the economy is a big problem these days. The pumper truck has brought in a lot of business that we wouldn't have had."

(continued)



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## When Times Are Tough

When the economy took a nose-dive, Les Harris didn't sit around hoping things would get better. He seized an opportunity to build an even bigger business.

"It's always a risk," he says. "The truth is that the expansion had to happen. We had customers who were asking us to offer the pumping service anyway, so it wasn't that far out of left field. Once we bought the truck, we thought work would be slow. But we were surprised. Once people found out we had the truck, the phone started ringing. So word of mouth turned out to be really important.

Of course, we push the service, too.

"We advertise regularly in the Yellow Pages and on local radio. We pay for some public service ads. For example, we sponsor ads that promote safety for the kids going back to school."

The company also advertises during the Boatnik race, a local boating event that supports children's programs such as 4-H and local sports and parks programs. "Public service is something that's important to us, so we try to stick with it, and not just because it's a nice thing to do," Harris says. "It shows that you're a part of your community."

It also brought in some business that Harris wasn't expecting – repair work to supplement his installation business. "We don't offer operation and maintenance, only because in Oregon you must be licensed," says wife and co-owner Stacy Harris. "But we service our customers up until it requires a licensed O&M contractor."

### Building business

About 40 percent of calls to Mr. Ed's are for maintenance checks, and sometimes an employee finds something wrong, such as a failed pump or a cracked tank. In those cases, the company recommends the appropriate repair.

Most of the time, people already know they have a problem when they call for service. "A homeowner might call saying that there's effluent surfacing somewhere around the tank or in the drainfield," Harris says. "When we get there, we diagnose it. Sometimes, though, the problem isn't obvious." In those cases, his years of experience lead him to the answer.

"Just because the tank is

backed up doesn't mean there's anything wrong with it," he says. "The real problem could be further down the line, like in the drainfield. You just have to take your time to analyze the situation and not jump to conclusions. You do one bad service call, and you lose 20 customers because that one customer will tell everyone they know. Word of mouth is very important in this business."

**"You do one bad service call, and you lose 20 customers because that one customer will tell everyone they know. Word of mouth is very important in this business."**

Les Harris

Harris believes good customer service is paramount in keeping and building business: "When people come home and they can't get the toilet to flush, we're there to help them. Staying in business means keeping customers happy – it's taking calls on weekends and

Left: Ed Ownbey, former owner of Mr. Ed's Advanced Septic, is still an advisor and part-time crew member. Here, Ownbey works a 2009 Kubota excavator. Below: Mr. Ed's team members include, clockwise from left, Les and Stacy Harris, Ed Ownbey, Jasen Russell, and Mike Tracer.



(continued)

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Christmas Eve. People say that I am a workaholic, but hard work is what keeps the company going.”

### Buying used

Getting into the pumping side added to the workload. The company's vacuum truck is a 1990 Mitsubishi Fuso HD-FX with a 2,000-gallon Leland tank and a Masport pump. “We decided to buy a used pumper truck because we didn't want a payment – especially since we didn't know if the risk was going to pay off,” says Harris. “With a used truck, of course, the up-front equipment price was lower right from the start.”

Harris also purchased a 1992 10-cubic-yard Ford dump truck to complement the company's other equipment, which includes:

- Freightliner ramp truck
- 410 E John Deere backhoe
- Two Kubota steel trackhoes
- B-6 Yanmar steel trackhoe
- Dodge 2500 pickup truck
- GMC utility truck

The newly purchased equipment and increased business have breathed new life into Mr. Ed's, but it is in no way a new company. Mr. Ed's had been around long before Harris bought it. The company gets its name from original owner Ed Ownbey.

“You could say he was my mentor,” says Harris. “I learned everything in business from him. If I have any questions, he guides me.” Now, with more than three decades of experience of his own, Harris profits from his own skill in onsite installation.

### Soil challenges

“Being able to go onto a site that has problems and put in a system that works properly, and knowing the owner won't have to worry about health issues, is one of the most satisfying parts of this job,” says Harris.

That takes an understanding of soil and site conditions. Oregon has nearly 1,000 kinds of soil, from deep to shallow, from clay to sand,



Jasen Russell shovels rock to level the fill on a drainfield.

with terrain from nearly level to steeply sloping. The company tries to use conventional stone and pipe where possible.

“The decision on what type of system to use really isn't hard,” says Stacy Harris. “We have our

Whitewater DF-50 and DF-150 units (Delta Environmental Products).

“Oregon is one of the hardest states to get anything approved in,” says Harris. “Putting in a septic system in a rural county here is

**“When people come home and they can't get the toilet to flush, we're there to help them. Staying in business means keeping customers happy — it's taking calls on weekends and Christmas Eve.”**

Les Harris

preferences, and we try to make the best decision according to the soil types, accessibility and economics. We feel the best system in a clay area is good old rock and pipe. For steep slopes, we try to use rock and pipe, too, if it's accessible for dump trucks. If not, we use EZflow media (Infiltrator Systems Inc.)”

Where site conditions call for advanced treatment units, they have deployed AdvanTex AX20-RT systems (Orenco Systems Inc.) and

something you need to plan for. The price of rock and pipe makes it really hard. But the regulations usually dictate what you can and can't do. Oregon is very regulated because the groundwater is one of the state's biggest resources. But the rivers are protected, too.”

### Being ready

Because job sites can be unpredictable, Harris believes installers need to be organized and set up

their days accordingly. “It's always a planning process going on in this business,” he says. “What are we doing each day? What products do we need?”

“I can be on any job site at any time. Or I may be in the office writing up bills or doing other paperwork. I am where I am needed. If that means that I'm needed on the end of a shovel, that's where I am for the day.”

Being prepared also means keeping up with new treatment technologies and techniques. For that, Harris relies on trade shows. “We're required to earn continuing education credits,” he says. “A lot of the shows have classes where you earn those credits. All the classes I've been to have been well worth the money.”

Bringing that knowledge back to the business and the employees strengthens the company's foundation and creates an organization that can easily move with the times. The Mr. Ed's team, in addition to Ownbey, includes Mike Tracer, who has 10 years with the company, and Jasen Russell, just in his second year. Harris says that without Stacy, the business wouldn't be the same.

### Getting respect

“She works right out there with us,” says Harris. “She can drive the trucks. She doesn't operate any equipment, but she will tote pipe up and down the hill and shovel whatever needs shoveling. She's our main permit runner. I tell everybody she's the person to go to for permitting.”

Stacy loves her job. “What I like best is learning just how technical flushing your toilet really is,” she says. “I like the challenges that every system has – never two the same. That, and I like working outside. I'm not much for doing office work, although I do that, too.”

Seeing a woman on the job in the onsite industry takes some people by surprise.

“The biggest challenge that I



Stacy and Les Harris with the company's vacuum truck, a 1990 Mitsubishi Fuso HD-FX with a 2,000-gallon Leland tank and a Masport pump.

have to overcome is getting respect in a man's industry," says Stacy. But after 35 years in the business, she has made her mark. People no longer stare when they see her shoveling rock with other employees – she is part of the team.

### Charity at home

The Mr. Ed's team is not all about making a profit: The company does substantial charitable work. "We did some work for an elderly lady," says Harris. "We donated a tank, and a friend donated the rock, and we got the system put in the ground. We didn't make any money, but that wasn't the important part. We're serving our community."

For people who may be short of money, there are always options. "We've had customers who pay us \$25 a month until they get their bill paid off," says Harris. "We try to do good-quality workmanship in any situation."

Harris says that the charity work hasn't affected his pricing, but the economy has caused him to make some changes.

"Three or four years ago, people would call and say, 'Just come do it,'" he says. "But with the way the economy has been, we see a lot more people shopping for the better value. And that makes pricing tricky, because now a lot of our work comes through bids. We've

been successful in securing bids because we stay consistent, considering the materials that we use, our equipment, labor costs and other factors.

"For the most part, we keep our pricing in the middle. If you price too high, people are suspicious. Too low, you can't make any money.

"Our biggest advantage in this market is longevity. People know us. We get customers who say that Mr. Ed's put in a septic system for their grandparents. And that might have been 40 years ago. Longevity is what keeps us alive. We lasted through the '80s when you couldn't buy a job. It's 2011. And we're still here." ■

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CAN Patent# 2,237,751



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The 7" filter in a 5" square concrete baffle.



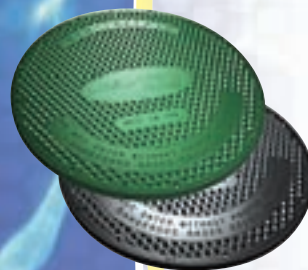
The 4" filter in a 4" Tee.

Sizes Available:  
4" yellow  
6" white  
7" red  
8" blue

Patent# 6,811,692

#### Polycarbonate Covers

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Patent# 6,167,914

#### Float Tree Accessories

- » Easy adjustments
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# Destination Indy

The 2012 Pumper & Cleaner Environmental Expo will deliver the best the industry has to offer, all wrapped up in a convenient new package

By Jim Kneiszel

It will never be more convenient to attend the Pumper & Cleaner Environmental Expo than in 2012, when the biggest trade show for the environmental services industry moves to Indianapolis.

The renovated and expanded Indiana Convention Center will host the 32nd annual Expo Feb. 27-March 1, providing a simple-to-navigate exhibit space connected through skywalks to several modern hotels. Indiana, known as The Crossroads of America, is easy to reach by car, and the *Circle City*, as it's called, offers a state-of-the-art airport a short cab- or express bus-ride from downtown.

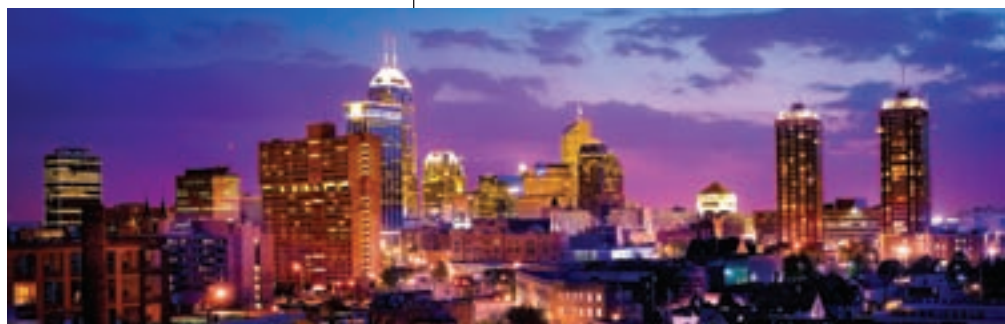
With 250 restaurants and clubs, and a large shopping mall connected to the complex of hotels serving the Expo, everything is within easy, climate-controlled reach. In fact, Expo attendees who stay in 4,700 interconnected hotel rooms will be a leisurely two- to three-minute walk from the exhibits.

"Visitors will walk back and forth to the exhibit hall, restaurants and shopping. And they'll be able to do that without ever taking their jackets along," says Bob Kendall, owner of COLE Inc., the Expo sponsor. "This convenience will help create more networking opportunities

Education Day kicks off Expo week with 40 seminars on Monday, Feb. 27, in new meeting rooms adjacent to the exhibit hall, with another 35 seminars planned for Tuesday and Wednesday. The doors to the hall swing open Tuesday through Thursday, Feb. 28-March 1. Hours for the exhibits are 9 a.m.-5 p.m. Tuesday and Wednesday and 9 a.m.-2 p.m. Thursday.

## NETWORK & LEARN

Several popular Expo events will continue as the show moves to Indy, according to Julie Gensler, Expo coordinator for COLE. The Expo will con-



than ever before at the Expo."

The quality of the new facilities will be matched by the exhibit and education offerings. The Expo will feature approximately 500 exhibitors who use this lofty stage to introduce the latest technologies in the wastewater industry to nearly 10,000 contractors from almost 50 countries. And interest in Expo Education Day continues to grow, with participants getting the cutting-edge training they crave.

tinue to offer fantastic networking opportunities, including roundtable discussions that were popular in 2011. An Industry Appreciation Night event is being planned for Tuesday, Feb. 28. The popular COLE Pub truck, which offers refreshments and a place for attendees to relax and unwind, will be moving into the exhibit hall for the first time.

And the Roe-D-Hoe competition, sponsored by the National Onsite Wastewater Recycling Association, will continue to attract top-notch machinery operators looking to win cash prizes for their skills, Gensler says.

New for 2012, the National Association of

Wastewater Transporters is planning a series of events aimed at sparking friendly competition among pumpers, portable sanitation contractors and drain cleaners in attendance.

Tracks of Education Day seminars are being presented by:

- National Onsite Wastewater Recycling Association
- National Association of Sewer Service Companies
- National Environmental Health Association
- National Association of Wastewater Transporters
- Portable Sanitation Association International
- Southern Sections Collection Systems Committee
- Northwest Michigan Onsite Wastewater Task Force

Another Education Day track of seminars will be presented by returning motivational speaker and business coach Scott Hunter. Additional seminars will be scheduled on Tuesday and Wednesday mornings, according to Gensler.

## ACCOMMODATIONS

Expo lodging is plentiful within walking distance of the ICC. Hotels connected to the exhibit hall include several Marriott properties, the Westin, Hyatt Regency, Omni Severin and Crowne Plaza. Many more hotels are located only a block or two away, near the Indiana State Capitol, White River State Park and Monument Circle. Gensler recommends booking early by going to [www.pumpershow.com](http://www.pumpershow.com) and clicking on the "hotels & travel" tab.

Based on other events set for Indy in early 2012, there's no doubt the city is up to the hospitality challenge of the Expo. Just before Pumper & Cleaner, Indianapolis will host the 2012 Super Bowl. Just after the Expo, the NCAA Final Four tips off at the Lucas Oil Stadium.

"The NFL chose Indianapolis for a reason," says Kendall, referring to the hotel, restaurant and entertainment infrastructure that has exploded in recent years to make Indy a world-class destination. With everything so handy, Kendall says folks who drive to the Expo will be able to park their cars and walk everywhere. And those who fly to Indy can cab it to their hotel and forget about needing to rent a car to get around.

"Once you're there, you can stay there,"

Kendall says. "Rental cars will not be necessary, which will save attendees a lot of money."

Those who want to venture out further will find that other attractions are a short cab ride away, including fabled Indianapolis Motor Speedway, the eclectic Broad Ripple Village neighborhood or the Children's Museum of Indianapolis, billed as the world's biggest children's museum, to name a few.

## THE MAIN EVENT

Setting aside the many options for entertainment, Kendall says there remains one over-arching reason for environmental services contractors to head to the Expo.

"We continue to offer the premier showcase for the best products the industry has to offer," he says. "The hands-on exhibits, networking and learning opportunities make this a *can't miss* event for industry professionals."

Early registration for the Expo costs just \$50 per person (until Jan. 20, 2012). At-the-door full registration is \$70 (\$50 for exhibits only). To learn more, go to [www.pumpershow.com](http://www.pumpershow.com) or call 866/933-2653. ■

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# SJE Rhombus®

Jim Anderson and Dave 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).

# Pumping Right

A sound pump installation avoids system leaks, protects electrical connections, and enables easy access for service and maintenance

By Jim Anderson, Ph.D., and David Gustafson, P.E.

As mentioned in recent articles on installing tanks, a good pump installation starts with making sure that the pump tank is watertight. In pump tanks, we have the same concerns as with septic tanks in making sure inlet and outlet penetrations are watertight, and we have additional concerns about the riser and the locations where the pump wiring leaves the tank.

Proper installation of the pump discharge assembly will ensure that the pump is accessible, replaceable and properly wired. The pump discharge assembly consists of all of the piping and components from the discharge to the point at which the supply line leaves the tank. This includes the pump, pump controls and

discharge line. All of this should be installed so that it is accessible from the surface.

## Proper bedding

The pump should be installed directly under the manhole, and this means using risers to the surface. Typically, the discharge piping is brought up into the manhole, where there is a quick disconnect, so that the pump assembly can easily be removed for replacement or service. The supply piping leaves the pump tank through the riser. This penetration must be sealed and watertight. In addition, proper backfilling around the riser is critical. The supply piping needs to be well supported and laid so that the pipe drains back to the tank.

A common way to provide protection and support is to put the 2-inch supply pipe through a piece of 4-inch pipe across the excavated backfill area. A 1/4-inch weep hole should be provided at the bottom of the pipe inside the riser to ensure that the supply pipe

**An example of poor installation of pump station wiring. Unfortunately poor wiring is more common than one might imagine.**



**A quick-disconnect coupling with a rope to help extract the pump is part of a quality pump installation.**

will drain back into the tank without going back through the pump. This arrangement without a check valve is critical for pumping situations in cold climates, where water standing in a pipe will freeze.

## Quick disconnect

The quick disconnect can be a three-part threaded union, a camlock fitting, or some other simple inline disconnect able to withstand the pressure created by the pump system. There are numerous camlock products on the market that make it easy to separate the pump assembly.

Rubber connectors with stainless steel bands are not appropriate for quick disconnects in pressure situations. We like to say they become automatic disconnects! Likewise, if you have to use a reciprocating saw to disconnect the pump, that indicates a poor installation.

The location of the quick disconnect in the riser should be no more than 18 to 20 inches from the access lid. This is the distance a person can reach down without entering the tank to disconnect the pump and then lift it to the surface.

A length of nylon rope, stainless







**Any electrical connections need to be made outside the corrosive tank environment and located in a weatherproof box near the pump tank or in a nearby building. Shown is a weatherproof box from SJE-Rhombus.**

steel cable, or other noncorroding material should be attached to the pump to facilitate removal during maintenance. It must be strong enough to hold the weight of the pump and assembly.

#### Mounting floats

The pump and controls should be replaceable – that means the pump wiring can also be taken out without a lot of extra work or digging. The wires should be run through a 2- to 3-inch conduit –

Remember that any electrical connections need to be made outside the corrosive tank environment and located in a weatherproof box near the pump tank or in a nearby building. It is also important to have the pump and alarm control floats on a separate float tree. This allows for the removal of the pump without affecting the float settings.

Also, in a repair or replacement situation, remember that pumps are sized and specified as part of a

**Rubber connectors with stainless steel bands are not appropriate for quick disconnects in pressure situations. We like to say they become automatic disconnects! Likewise, if you have to use a reciprocating saw to disconnect the pump, that indicates a poor installation.**

large enough for any plugs to be pulled through the conduit and the control box.

Using conduit with sweep 90s where the piping bends will allow for removing and returning cords when the replacement or repair is complete. If a plug is removed from a pump, it usually voids the warranty, so it is important to make these provisions as part of the installation.

complete delivery system: The pump and the pressure distribution system are tied together. When the pump is replaced, it must be replaced with a pump that delivers the same amount of effluent. Replacing it with a pump that is close will not do! It must be replaced with the model specified by the designer; or the designer needs to re-evaluate the whole system.

When installed, the pump should be elevated three to four inches off the bottom of the pump tank. Today, a number of pump tanks come with a cast-in pedestal for the pump. If this is not available, you can use the old tried-and-true method of placing several 4-inch-wide blocks on the bottom of the tank to keep the pump above any solids that may collect.

It takes more than one block to make replacement from the surface easy. Think of trying to balance a pump on the end of an 8-foot section of 2-inch pipe on a 4-inch surface at the bottom of the tank!

#### Proper wiring

The final piece to installation is having the pump properly wired. This means using watertight fittings, making sure the conduit is properly sealed so that gases cannot vent out through the control panel, and choosing the right size

wire from the box to the pump. The wire has to be large enough to meet the power demand of the pump. If the wire is too small, the pump will not operate properly and will wear out prematurely.

Make no electrical connections inside the pump tank. Connections should be located in a watertight, corrosion-resistant junction box with watertight, corrosion-resistant fittings and a cover with a sealed gasket rated for outdoor use.

In all cases, installation procedures must follow the specifications of the U.S. National Electric Code (NEC). States differ on who is allowed to work on the pumping system wiring. In many cases, the work must be done by a licensed electrical installer. Make sure you comply with your state and local requirements. We will say more about panels, control boxes and wiring in future articles. ■

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"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.

# Maine Adopts New Onsite Rules

By **Scottie Dayton**

**N**ew subsurface wastewater disposal rules for Maine include a 25-foot no-disturbance buffer from water bodies and fill extension limits that move onsite systems even farther away. The rules also state that soil evaluators must use Munsell soil color charts and municipalities must bring malfunctioning onsite systems into compliance within 10 days of notice. If property owners do not propose a repair or replacement plan, they will be evicted until the systems are fixed.

## Ohio

The Summit County Council adopted a resolution to replace aging onsite systems with a sewer. The project will be funded through assessments. The final cost to property owners is estimated at \$18,950, but officials said actual costs will not be known for more than a year. To move ahead, 85 percent of residents needed to approve the project.

## Alabama

The legislature adjourned with-

out passing a bill that would have banned counties from imposing a sewer service fee on properties not connected to it. Several lawmakers said they will try to pass the bill again in the next session. Jefferson County has a \$3.2 billion sewer debt and instigated the clean water fee.

## Texas

Governor Rick Perry signed legislation requiring childproof lids on septic tanks. Only homeowners or maintenance providers can open the lids.

## Oregon

If passed, a Senate bill would require the Department of Environmental Quality to establish grant and loan programs for owners of onsite systems. Another Senate bill in the public hearing stage would require sellers of real estate to obtain an onsite inspection report and provide copies to the DEQ and

to buyers making written offers to purchase.

## New Mexico

An amendment proposed by Bernalillo County Commissioner Wayne Johnson would remove the 2015 deadline to replace onsite systems installed before 2000. The upgrade is part of the Waste Water Requirements Ordinance.

If the date were removed, the county would still meet state mandates because it has some of the strictest septic system requirements in the state. Some residents considered the fines and up to 50 days in jail an acceptable alternative to replacing their functioning systems. The 2015 date was reportedly affecting home sales. ■

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# System Repair/Drainfield Rejuvenation

By Briana Jones

## Drainfield restoration

**Septic-Scrub** drainfield flow restorer from **Arcan Enterprises** is a chemical treatment that oxidizes sulfides and releases oxygen into the drainfield. This is similar to letting the system rest, but works faster. The environmentally friendly treatment is added between the septic tank and the drainfield and can also be used for preventive maintenance. The use of the system does not need to be restricted during treatment. 888/352-7226; [www.arcan.com](http://www.arcan.com).



## Bioremediation restorative

**AfterShock** soil absorption restorative from **Cape Cod Biochemical Company** restores drainage to clogged and sluggish drainfields and drainage structures while preventing backups and eliminating odors. The restorative contains multistrain bacillus spore-bearing bacteria and a bacteria-friendly, time-release oxygen source. The bacteria digest the solid material that normally clogs soil absorption areas.

The oxidizer accelerates the bacterial activity for an extended period of time, promoting fast biological activity of the organisms and degrading the sulfides in the biomat. The naturally occurring bacteria are USDA-approved and laboratory enhanced. The product is nonhazardous, nontoxic, contains no EPA Priority Pollutants and is environmentally safe. Bacteria and oxidizer can be applied at the same time, eliminating the need to keep the system exposed for repeated site visits. 800/343-8007; [www.septiconline.com](http://www.septiconline.com).

## Bacterial supplements

**BIO JET-7** liquid bacterial supplements from **Jet Inc.** break down and digest grease, fats, soap, scum, and other colloidal elements and dissolve organic materials in anaerobic and aerobic wastewater treatment systems. The supplements are useful in difficult startups or when a system becomes unstable due to changes in flow, chemicals or increased organics.

They can be used in larger commercial applications when the system fails to meet the requirements for discharge permits. The product is also useful for wastewater processes such as septic systems, lift stations, lagoons and ponds. **BIO JET-7 Plus Dry Packs** give the same performance in an easy-to-use quick-dissolving dry pack – users simply flush the packet. A year's supply comes in a recyclable plastic container. 800/321-6960; [www.jetincorp.com](http://www.jetincorp.com).



## Biological oxidation

**Lenzyme's Septic Scrub Plus kit** contains three bottles of Septic Scrub and one bottle of Drainfield Biological Activator. Septic Scrub Plus attacks the biomat buildup that causes blockage and breaks it down quickly by oxidation. The Drainfield Biological Activator is a special blended bacteria added to restore the soil's biological activity, which is depleted during the oxidation process. Once restored, the bacteria attack the leftover organic matter that was trapped in the field. One kit can handle a normal residential drainfield, and restoration takes only a few days. 800/223-3083; [www.lenzyme.com](http://www.lenzyme.com).



## Aerobic metabolism

The **VBT restoration system** from **O2 Aeration Technologies** supports aerobic bacterial metabolism, eliminating odors and reducing BOD and TSS and contamination of groundwater. The system results in a 75 to 90 percent reduction in waste put into the drainfield. With reduced waste and increased oxygen, the soil bacteria consume the excess biomat and solids, restoring the drainfield. Approved in Arizona, Florida, Minnesota, Texas, West Virginia and Wisconsin, the restoration kits are also being used as part of watershed programs to reduce pollution

from failed or failing septic systems. 830/743-4936; [www.paulswoyerseptics.com](http://www.paulswoyerseptics.com).

## Fast installation

The **Aerobic Recovery Unit (ARU)** from **On-Site Treatment Systems** is designed to fit any existing septic system and can be installed in an hour or less. The unit works with all organic or synthetic distribution component designs: gravel and pipe fields, chambers, dry wells and seepage pits, mounds, sand filters, cesspools and lagoons. It uses a nitrification/denitrification process and reverses and maintains biomat permeability to restore full system function. The unit is UL-listed and includes common hand tools for installation. 877/254-7093; [www.onsitetreatmentsystems.com](http://www.onsitetreatmentsystems.com).



### Waste digestant

**Poly-Cleanse** waste digestant from **Polylok** is a blend of bacteria and enzymes designed to attack organic waste, including grease, toilet paper and soap scum buildup. The environmentally friendly digestant is available in liquid or powder and can be used in septic systems, cesspools, ATUs, drainfields, drains, grease traps, lift stations, sludge ponds and sewers. 888/765-9565; [www.polylok.com](http://www.polylok.com).



### Advanced treatment

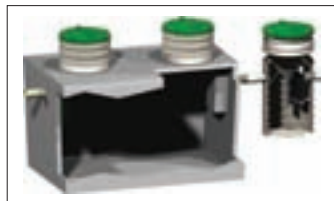
**Advanced Enviro-Septic (AES)** treatment systems from **Presby Environmental** are passive/nonmechanical systems that remove up to 99 percent of contaminants. Units create a self-sustaining ecosystem that provides



ideal conditions for long-term bacterial digestion. If a system malfunctions, it can be rejuvenated by exposing a small portion and allowing it to drain, providing abundant oxygen so aerobic conditions are re-established. AES systems are NSF Standard 40 Class I certified. 800/473-5298; [www.presbyenvironmental.com](http://www.presbyenvironmental.com).

### Filter package

The **Bear-in-a-Basin** filter package from **Quanics** and Bear Onsite incorporates a heavy-duty polyethylene single-piece construction basin with a high-quality effluent filter. The system can be installed on new systems if access to the primary tank is difficult or not desired. It is also good for use on repairs when installation of an effluent filter in the existing tank is not possible. The unit arrives prepackaged with all components necessary for installation including basin, filter, lid and rubber grommets. Additional interlocking 6-, 12- or 18-inch risers are available for deeper installation. 877/782-6427; [www.quanics.net](http://www.quanics.net).



### Soil restorative

**Septic Drainer** soil restorative from **RCS II, Inc.** is designed to improve the perkability of soil for better drainage and prevent drainfield replacement. When sodium binds with soil, creating a densely packed barrier, the calcium polysulfate in the product remediates the bound soil by driving the sodium out. It is formulated to work on all types of septic systems including conventional systems, dry well systems and cesspool systems. The product is a nonbacterial, nonenzyme liquid formula.



518/812-0000; [www.septicdrainer.com](http://www.septicdrainer.com).

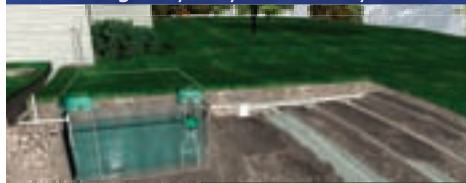
### Enzyme additive

The **RID-X Commercial Septic System Treatment** biological additive contains natural active bacteria and enzymes that digest household waste. It has no harmful chemicals and is safe for septic systems. Its dual-action formula contains advanced enzymes that break down household waste and natural bacteria that work to produce more enzymes to prevent septic system failures and backups. A 48-oz. bottle contains a 6-month supply for septic tanks up to 1,500 gallons. 855/776-7439; [www.rid-x.com/professionals](http://www.rid-x.com/professionals). ■



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## Biofilter replacement for seasonal homes

### Problem

Two summer homes on a 100,000-square-foot island in Lake George, N.Y., had defective onsite systems. A barge pump serviced the septic tanks every three to four weeks. With 18 inches of soil over solid rock, the only answer was an alternative pretreatment system.

### Solution

The designer specified seven 150 gpd **Puraflo peat biofilter modules from Anua**, one per bedroom. Duplex pumps time-dose the systems, sending effluent to a distribution grid at the top of each unit. Purification occurs as the liquid percolates through the media over 36 to 48 hours. The peat also suppresses odors. Effluent discharges through a gravel pad beneath the modules.

“When the house is vacant during winter, the microorganisms survive on the media,” says Chris Ray, executive account manager for Anua. “Once the homeowners return, the peat system reactivates to optimal performance.” The media has a projected life span of 15 years.

### RESULT

The systems produce effluent with BOD and TSS less than 10 mg/l, ammonia nitrogen less than 5 mg/l, and fecal coliform less than 1,000 per 100 ml. 800/787-2356; [www.anua-us.com](http://www.anua-us.com).



## System handles high-strength wastewater

### Problem

Six months after a couple moved into their retirement home on Puget Sound in Washington, effluent surfaced on the drainfield. A laboratory report confirmed BOD<sub>5</sub> at 700 mg/l. After they exhausted conventional repair options, the King County Health Department referred them to Aqua Test.

### Solution

**Aqua Test** performed a site evaluation, and the homeowner provided information on daily operational practices. The evidence showed the probable cause of surfacing effluent was extremely high BOD<sub>5</sub> loading compounded by chemotherapy medicines. Aqua Test recommended installing **two Nibbler CBP (Cylinder Back-flush Pod) units** to reduce the BOD<sub>5</sub> and neutralize the pH while maintaining high dissolved oxygen.



### RESULT

Additional samples were taken after the Nibbler units were installed. Analytical data revealed the BOD<sub>5</sub> levels were reduced to an average of 16.77 mg/l, pH 7.15, and dissolved oxygen 4.1 mg/l. Today, the system is in compliance with state regulatory requirements. 800/221-3159; [www.aquatestinc.com](http://www.aquatestinc.com).

## Aerobic bacterial generator

### Problem

A restaurant in Gloversville, N.Y., with a failing onsite system was under corrective orders from the state Department of Environmental Conservation. The owner chose to remediate the stone drainfield with three P-80 Aquaworx Remediators from Infiltrator Systems Inc.

### Solution

The aerobic bacterial generators are 36-inch-high by 15-inch-diameter airlift columns inserted into the septic tank. Cusped plastic wrapped around the bottom outside of the unit and placed within and above the bubble diffuser provides the surface on which proprietary bacteria colonize.

The unit has a 1/2 hp air pump with built-in alarm that supplies air through a 1/2-inch PVC Schedule 40 line discharging at the bottom of the column. Aeration circulates the water and creates an environment that enables the microbes to digest organic waste and remove nitrates. More than 25,000 gpd pass through the 150 square feet of plastic. As effluent flows to the drainfield, bacteria migrate with it to consume the biomat and improve the nitrification phase.





## RESULT

Within weeks, the waste strength was reduced and the drainfield was no longer ponding. 800/221-4436; [www.aquaworx.com](http://www.aquaworx.com).

## Aerobic treatment upgrade

### Problem

Wastewater ponding in the yard of a three-bedroom home on a lake near Fortville, Ind., alerted owners to their second onsite system failure in two years. Keith Abernathy of A & M Excavating evaluated the soil as fill removed from the lake bed.

### Solution

Abernathy installed a **RetroFAST 0.375 enhancement unit from Bio-Microbics** in the 1,000-gallon septic tank, then added a dosing tank and 50 more feet of laterals to the drainfield. The fixed activated sludge treatment (FAST) system combines attached and suspended growth in an aerobic packed bed bioreactor. Nitrification and denitrification occur in the 41- by 24- by 33.5-inch module. An aerating blower, the only moving part, oxygenates the effluent before delivery to the drainfield, where aerobic bacteria digest the biomat.



## RESULT

The property is dry and the system operates as designed. 913/422-0707; [www.biomicrobics.com](http://www.biomicrobics.com).

## Aerobic treatment system

### Problem

Effluent ponded in the outdated drainfield of a 44-unit mobile home park in Allegan, Mich., and raw sewage flowed into a swamp forest draining into Swan Lake. The owner called maintenance provider Rod Carroll of Wray's Septic Tank Co. in Allegan to pump the 20,000-gallon septic tank twice a year until health officials gave him the ultimatum to replace the system in three months.

### Solution

Carroll worked with Randy Rapp, P.E., of Exxel Engineering, to design the system using a **Fusion purification tank from Clarus Environmental, a division of Zoeller Co.** The 5,000 gpd system used the existing septic tank fitted with a Clarus WW4 effluent filter. Carroll installed two 2,400 gpd ZFL Fusion treatment units in parallel, dividing influent evenly with a Tru-Flo splitter box. Two Zoeller N153 pumps send effluent from the 1,500-gallon dose tank to two 32- by 78-foot low-pressure drainfields in six zones.



## RESULT

The system performs as designed and effluent meets secondary treatment standards of 30 mg/l BOD and TSS. Maintenance is twice per year. 877/244-9340; [www.clarusenvironmental.com](http://www.clarusenvironmental.com).

## Mound treatment remedy

### Problem

Effluent leaked from the corner of a homeowner's sand mound. The estimated replacement cost was \$10,000. He called Dave Estopare of Drainfield Restoration Services in Bend, Ore.

### Solution

Estopare first fractured the mound with a Terralift pneumatic hammer. Two months later, the leak returned. He then poured **BioSpan and BioCell from DRS Environmental** into the septic tank. BioSpan, a blend of 57 microbial strains with 10 billion microbes per gram, degrades waste. BioCell is a natural stimulant.

## RESULT

After two applications in one month, the mound returned to normal. The owner uses the microbial solution weekly and both products once a year. 541/388-4546; [www.drsenviron.com](http://www.drsenviron.com).

# System Repair/Drainfield Rejuvenation

By *Scottie Dayton*

## Absorption bed flow recovery

### Problem

The drainfield for a three-bedroom home was failing. The homeowner called service provider Tom Frank of Tim Frank Septic Tank Cleaning Co.

### Solution

Frank replaced two distribution boxes, jetted and vacuumed the leachfield trenches, fractured the soil with a Terralift machine, and added a **bioremediation kit from Ecological Laboratories**. The kit contained two gallons of Pro-Pump/HC (high count), one gallon of Pro-Pump/SA (sludge away), and one pound of Pro-Pump/OX (oxygen). The two-gallon infusion of live facultative bacterial culture increased the breakdown of the biomat. The oxygen-release compound accelerated recovery, and the gallon of biostimulants enhanced both cultures.



### RESULT

The drainfield was restored. Frank services the system every two years, adding a quart of Pro-Pump/HC to the tanks. The homeowner adds Pro-Pump/SP (septic packets) monthly. 800/326-7867; [www.propump.com](http://www.propump.com).

## Aerobic treatment with constructed wetlands

### Problem

Bolingbrook (Ill.) Park District hired Wight & Co. to design a sustainable 7,000-square-foot education center on 17 wooded acres. One criterion was using a constructed wetland to treat wastewater.

### Solution

Septic Solutions donated a **Set-N-Go aerobic treatment unit from Hydro-Action Industries**. The NSF 40 Class 1 system includes a pretreatment tank, an aerobic treatment tank, and a pump tank in one container. A pump in the aeration compartment injects air through six diffuser lines to oxygenate wastewater. The liquid then enters the clarification compartment, a conical area in which remaining solids settle and are returned to the aeration compartment for further treatment. Clear effluent leaves the chamber through the outlet baffle for dispersal in the wetland.



### RESULT

Purified wastewater enables the wetland ecosystem at Hidden Oaks Nature Center to thrive. 574/936-2542; [www.hydro-action.com](http://www.hydro-action.com).

## Solution for military recreation area

### Problem

The wrong grade of sand in the onsite system at the Pointes West Recreational Area in Appling, Ga., caused the sand filter to fail. Attached to the Fort Gordon military base, the site includes cabins, campsites, boating facilities, and a motel for military personnel. Wastewater flows range from 4,000 gpd in winter to almost 50,000 gpd in summer. The U.S. Army Corps of Engineers needed a replacement technology that handled such variations while treating wastewater to 30 mg/l BOD and TSS.

### Solution

The officers selected **AdvanTex AX100 textile treatment modules from Orenco Systems Inc.** Integrated Water Services installed a dozen 5,000 gpd pre-engineered units on top of the sand filter. The textile media provides a surface for microbial attachment, producing immediate filtration of TSS and BOD reduction.

The compact design of the 16- by 8- by 3.5-foot modules expedites installation and minimizes disruption. The system, with peak flows of 60,000 gpd, has telemetry monitoring and draws 3 kWh/1,000 gallons. During winter, half the system is taken offline. The system can be expanded to 100,000 gpd within the original sand filter.



### RESULT

The system was designed and installed in 120 days. Effluent BOD and TSS average less than 10 mg/l. 800/348-9843; [www.orenco.com](http://www.orenco.com). ■

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# Sand, Surf and Septage

**A secondary treatment unit with recirculating compartments enables a contractor to replace failed systems on beaches in southern California**

By **Scottie Dayton**

Onsite systems at 16 beaches on Santa Monica Bay, Calif., had exceeded their useful lives. Most were at risk of overflows and required pumping every two weeks, as sand blowing in through corroded cast-iron lids filled them three-quarters full.

Monthly water samples taken by the Los Angeles County Department of Environmental Health confirmed intermittent high bacteria counts. Concern for the health of swimmers and surfers led the U.S. EPA to issue new total maximum daily loads for bacteria.

The Los Angeles County capital fund enabled the Public Works Water Resources Division to replace the onsite systems with advanced treatment units. Because ammonia in effluent could affect

marine life, the board issued additional waste discharge limits for nitrogen and bacteria.

Public Works project manager Alex Villarama, P.E., selected AdvanTex AX-MAX modules for their ability to meet stringent regulatory requirements. Zach Adams of JS Innovative Systems in Malibu won the bid. The installations were the first of their kind in southern California.

### Site conditions

Sand soil with the water table eight to 14 feet below grade, depending on the tides.

### System components

Villarama designed identical systems to handle 1,500 gpd each. Major components are:



**Juan Ramirez of JS Innovative Systems helps a crane operator from United Rentals maneuvering a 6,500-pound AdvanTex AX-MAX module from the delivery truck. (Photos courtesy of BioSolutions Inc.)**

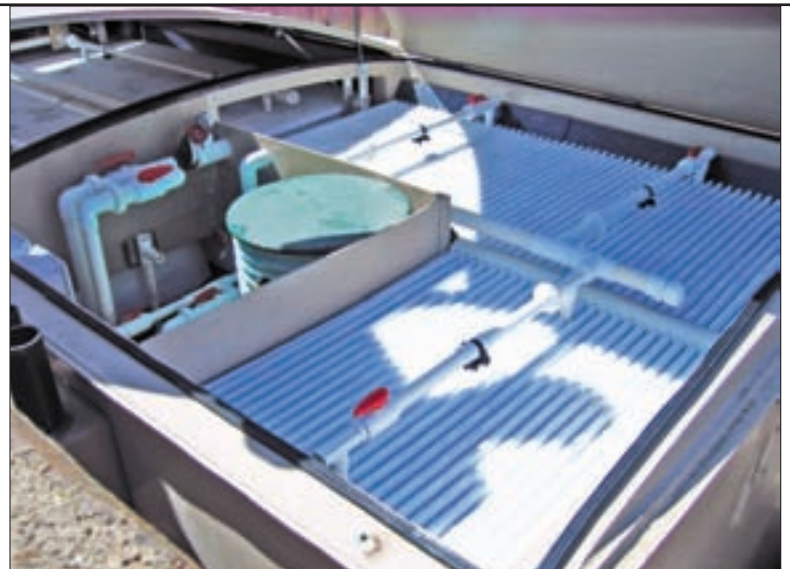
- 3,000-gallon Xerxes fiberglass septic tank with duplex single-phase, 50 gpm, 1/2 hp, 2-inch effluent pumps from Orenco Systems Inc. Most components supplied by BioSolutions Inc., Agoura Hills, Calif.
- 4,500-gallon AdvanTex AX-MAX packed bed filter module, Orenco
- 60-gallon buffering basin, Orenco
- BK2000CD chlorination-dechlorination unit with tablets, Norweco Inc.
- 3G ultraviolet disinfection chamber, Salcor Inc.
- Ozone disinfection unit, O3H2O4U
- 1,000-gallon concrete dosing tank with Orenco duplex single-phase, 10 gpm, 1/2 hp, 1 1/4-inch effluent pumps, Jensen Precast
- Siemens magmeter/flowmeter integrated into custom TCOM control panel with telemetry, Orenco
- 360 feet of Geoflow drip tubing with headworks
- 2,500-gallon concrete sand

## System Profile

<b>Location:</b>	Malibu, Calif.
<b>Facility served:</b>	Point Dume State Preserve
<b>System designer:</b>	Alex Villarama, P.E., Los Angeles County Public Works
<b>Installer:</b>	Zach Adams, JS Innovative Systems, Malibu
<b>Site conditions:</b>	Sand; water table eight to 14 feet below grade
<b>Type of system:</b>	Recirculating packed bed filter discharging to drip dispersal
<b>Hydraulic capacity:</b>	1,500 gpd



**TOP:** Straps and turnbuckles secure the 3,000-gallon Xerxes septic tank to the concrete deadmen. **RIGHT TOP:** The discharge side of the Advan-Tex AX-MAX module shows the textile media, distribution manifold with spray nozzles, vent fan, and recirculation piping. **RIGHT BOTTOM:** The 2,500-gallon concrete sand trap at Restroom One collects water from four outdoor showers. Fines settle out before the water discharges in the septic tank.



trap, Jensen Precast

- Rain switch system with butterfly valve from Jensen Instrument Co. of Southern California, supplied by JS Innovative Systems

### System operation

Wastewater flows 25 feet through a 4-inch drain-waste-vent (DWV) pipe to the septic tank. Every hour, the pumps send 100 gallons to the three-compartment AX-MAX module. As influent enters the 3,000-gallon recirculation-blending chamber, it blends with fil-

trate dripping from the hanging textile media.

trate dripping from the hanging textile media. A baffle divides the flow between the recirculation-blending and recirculation-filtrate chambers, and a recirculation return valve controls the liquid levels. No wastewater passes into the second chamber without first flowing through the media. In the buffering basin, a peristaltic pump injects soda ash to increase alkalinity for ammonia reduction and enhanced nitrogen removal.

After buffering, effluent gravity-flows through 4-inch DWV pipe to

**“We installed a butterfly valve in the pipe just before the sand trap. A gauge on the restroom roof closes the valve if it detects one-tenth of an inch of rain. That way, we don’t process runoff.”**

Zach Adams

trate dripping from the hanging textile media.

A pump in a walled-off area sends 100 gallons per hour through a one-way transfer line to a manifold above the media, which distributes the effluent for further treatment. As it percolates through the media, microorganisms remove impurities. A portion of each dose drips into the 1,500-gallon recirculation-filtrate

the chlorination-dechlorination unit, followed by UV and ozone chambers for additional disinfection. It continues to the dosing tank, in which pumps pressurize a magmeter for flow monitoring before sending the liquid to the drainfield. The headworks equally doses six 60-foot laterals on 12-inch centers with 1 gpm emitters spaced 12 inches apart.

The telemetry control panel allows the operator to monitor system performance. Effluent quality measures 6.4 mg/l BOD5, 5.9 mg/l TSS, 90 percent nitrogen reduction, and no *E. coli* colonies.

### Installation

Adams’ crew removed the old tanks and distribution boxes but could find no trace of the drainfields at Point Dume State Preserve. “Restroom One was the most challenging installation because the drainfield was on the beach 60 feet from the building,” he says. “Excavations required shore boxes from Trench Shoring Company and a 23-ton Terex crane to set them and the tanks.” Adams used a Caterpillar 320 excavator.

The lateral from the restroom was four feet below grade, necessitating a 10- by 20-foot shore box and 12-foot-deep hole for the septic tank on a 12-inch gravel bed.

“That was a lot more material to remove than anticipated, and it concerned me,” says Adams. “I also had only 12 inches on either side of the tank to set the 21-foot-long concrete deadmen, then secure the tank to them with straps and turnbuckles.”

All except the concrete tanks needed anti-buoyancy measures, as the occasional high tides of winter would push four feet of water into the holes. The 21- by 8-foot-high treatment module, weighing 6,500 pounds, required an 11- by 25-foot shore box and 9-foot-deep hole. Orenco designed a custom anti-floatation device using six steel tubes on 4-foot centers bolted across the bottom of the tank and protruding 18 inches on either side. They raised the tank six inches.

“The last half of the protrusions had two grooves for running rebar parallel to the module,” says Adams. “We tied them in place

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while the tank was still on the delivery truck. They installed very easily." After setting the unit, the crew filled it with water, and a cement truck dumped two-sack slurry into the hole, covering the rebar by two feet.

The disinfection train required an 8-foot-long, 8-foot-deep hole. "The UV or ozone unit would have sufficed, but people here don't understand wastewater treatment," says Adams. "Alex believed the system would be an easier sell if it had redundancy."

Because of the system's location and the other two under parking lots, Villarama specified EBW H-20 traffic-rated lids from Franklin Fueling Systems. They were set in 12-inch-thick concrete slabs that covered the fiberglass tank lids and risers. Since the slabs were visible from the canyon homes above, Orenco matched their colors to beach sand and aging asphalt for camouflage. The lids are 12 inches apart.

Adams' crew installed a 4-inch channel drain to catch the water from four outdoor showers. Fines settle out in the sand trap before

the water discharges into the septic tank. "We installed a butterfly valve in the pipe just before the sand trap," says Adams. "A gauge on the restroom roof closes the valve if it detects one-tenth of an inch of rain. That way, we don't process runoff."

Installing the drip tubing was straightforward. The drainfield, on the high side of the parking lot, is in an overgrown area. "We planted similar vegetation to camouflage it," says Adams. The crew also sank bollards every four feet around the treatment module, then welded chain to them to discourage foot traffic.

### Maintenance

BioSolutions holds the maintenance contract. Every two weeks in summer, a technician checks the chlorine tablet supply and UV lamp. Twice a year, he opens the septic tanks to check the scum, sludge, and water levels, runs a cycle on the pumps and checks the control panel. Public Works samples the effluent monthly. ■

### MORE INFO:

**Caterpillar, Inc.**  
309/675-1000  
[www.cat.com](http://www.cat.com)

**Geoflow, Inc.**  
800/828-3388  
[www.geoflow.com](http://www.geoflow.com)

**Jensen Instrument Co. of Southern California**  
626/969-7991  
[www.rainswitch.com](http://www.rainswitch.com)

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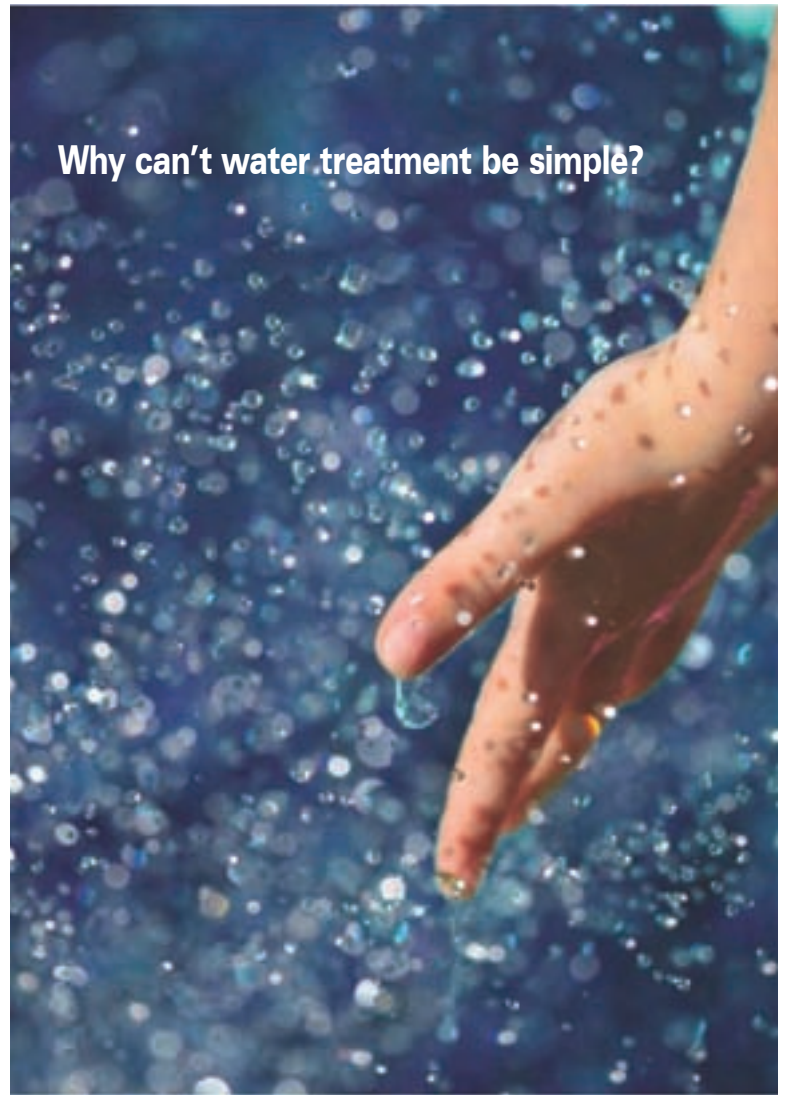
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### Serious Thermal Introduces Ground-Thawing Machine

The Serious Toaster ground-thawing machine from Serious Thermal Products Ltd. thaws up to 1.6 inches deep per hour in a 2-foot by 10-foot area. Multiple units can be placed in a series or other configuration to accommodate larger applications. The unit is

controlled by a solid-state electronic system and fueled by propane. Delivering 60,000 Btus, it produces no open flame, can be placed next to buildings and utility pedestals and can operate in temperatures down to -40 degrees F. Weighing 345 pounds, the units fit in a standard pickup bed and can be moved by two people. 403/671-7393; [www.seriousstoaster.com](http://www.seriousstoaster.com).

### Innovative Equipment Introduces Towable Mini-Excavator Line

TMX Towable Mini-Excavators from Innovative Equipment feature a quick-on and quick-off hitch system and zero-turn technology for access in tight locations. Available in gasoline or diesel models, the excavators can be towed by a 1/2-ton pickup, van or light-duty tow vehicle. No trailer is needed and no CDL



license is required. Lockout hubs enable towing at up to 65 mph. Weighing 2,941 pounds, the excavator has an 8-foot digging depth, 6,600-pound digging force and 7-foot, 2-inch loading height with swing radius of 140 degrees. It also has a 72-inch, four-way blade system with 21 degrees of tilt. 715/359-3002; [www.tmx-excavator.com](http://www.tmx-excavator.com).



### Roth Introduces X-Pert S5 Pipe with Oxygen Barrier

X-Pert S5 PE-RT pipe with oxygen barrier from Roth Industries Inc. is made with DOWLEX 2344 polyethylene copolymer resin for high temperature resistance and hydronic heating. The five-layer pipe (ethylene vinyl alcohol polymer sandwiched between two layers of DOWLEX and two layers of adhesive)

features a smooth surface for improved flow, long-term strength and protection against oxidation. 315/475-0100; [www.roth-usa.com](http://www.roth-usa.com).

### CEAttachments Introduces Stump Removal Bucket

The EDGE stump removal skid-steer bucket from CEAttachments Inc. is made for removing tree stumps, roots and digging ditches or moving and placing rocks. The attachment features three, 23-Series cast-steel teeth that cut through roots or help extract stumps with a tilt of the quick-attach. It has a 1/2-inch, laser-cut, funnel-shaped steel bucket with 1-inch-thick cutting edge. The bucket has an overall length of 62.5 inches, is 46 inches wide and 20 inches high. 866/232-8224; [www.ceattachments.com](http://www.ceattachments.com).



### Netafim Offers Low-Volume Dripperline

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# Fixing Failures

Being a good resource for customers means knowing all the tools available for analyzing and restoring failing soil treatment areas

By Tom Fritts



I think we would all agree that this economy is affecting everyone. I missed the Great Depression, but I am reminded of it by my mother-in-law, Rosemarie, every time I get frustrated with some turn-of-the-century appliance that she wants to fix – again.

“Just buy a new one,” I say. To which she replies, “You didn’t live through the Depression, son.” We are not in the same financial situation as during the 1930s, but it has gotten scary enough to get a lot of people thinking just like Rosemarie. This is especially true when it comes to making a choice of replacing or fixing a failing lateral field.

## Steps forward

Several things in the past 15 years have influenced the cost and effectiveness of lateral fields. It is true that many of our new products and techniques have given the soil a much better chance of safely returning our wastewater to the hydrologic cycle and extending the life of the lateral field or soil treatment area indefinitely.

It is also true that this huge step forward comes with a cost. And that cost has many people with failing lateral fields looking at less expensive solutions than total replacement.

With demand comes supply. As a market develops, so do the suppliers to fulfill the demand. When the demand causes the suppliers to

grow rapidly, we need to remember the legal doctrine, *caveat emptor*, or “buyer beware.”

When considering the repair of a failing lateral field, it is important to do your due diligence to ensure that you are making correct decisions.

Most lateral field failures result in surfacing or ponding of effluent on the surface. This occurs when the application rate is greater than the infiltration rate through the clogging mat into the soil. Several products have been developed to deal with these failures. Methods available today include adding hydrogen peroxide, using enzyme additives, applying aerobic remediation, injecting high-pressure air next to and beneath the clogging mat, immediately followed by forcing small-diameter beads into the fissures.

## Thinking carefully

Determining the best fix for any failing soil treatment area requires turning over all the stones you normally would when preparing to spend large sums of money. It’s important to remember that there is a difference between research findings and sales material.

Some of the most comprehensive research work covering this issue to date is the 1997 Converse & Tyler paper, “Aerobically Treated Effluent for Renovating Failing Absorption Units.” This study eval-

uated the feasibility of using aerobically treated effluent to renovate failing soil treatment areas that had failed due to the development of a clogging mat that restricted infiltration rate. Failure was defined as sewage backing up into the home,

soil treatment area, you would also introduce aerobic bacteria in an effluent rich in dissolved oxygen, where the only thing missing to satisfy the bacteria is a food source.

**Determining the best fix for any failing soil treatment area requires turning over all the stones you normally would when preparing to spend large sums of money. It’s important to remember that there is a difference between research findings and sales material.**

breaking out onto the ground surface, or ponding.

The authors evaluated 35 units over three years. Thirty of the soil treatment areas were renovated. The authors state in their conclusion that “renovating failing soil absorption units by introducing aerobically treated effluent appears feasible and should be investigated as a means of continuing the use of the existing soil absorption units.”

## More tools to use

More than one company has done exactly what Converse & Tyler suggested by investigating and developing a product that is marketed and sold expressly for remediating failing lateral fields.

The results of the study and the research done by these companies would suggest that by introducing aerobically treated effluent to the

The food source becomes the biomat that has formed on the trench bottom and walls. Once the bacteria consume this food, effluent can again access the infiltrative area, and percolation resumes.

As an installation contractor or service provider, you can use this information and these new products as tools when analyzing a failing system. This is a fast-moving industry that needs knowledgeable and professional contractors to answer. It is clear to see that this economy is pushing business in the direction of the most informed and educated contractors.

## About the author

Tom Fritts is vice president of NOWRA and co-owner of Residential Sewage Treatment Co. in Grandview, Mo. ■



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## Exempting Surface Discharge

The July Wisconsin Onsite Wastewater Recycling Association newsletter details members' efforts to stop legislation to offset the cost of replacing failed systems and maintenance by allowing surface discharge and permitting residents to decide when to pump their septic tanks.

Legislators also bowed to pressure from individuals not wanting to pay for pumping and inspections. They pushed to repeal the mandatory six-hour maintenance class to care for their systems or have the state pay for it. "One resident said that he doesn't have to look in his septic tank to determine whether it needs pumping because he found a chart online telling how often to pump a tank based on size and number of occupants," says Todd Stair, WOWRA president.

Rep. Jerry Petrowski will re-introduce the bill when the legislature reconvenes. "Once people become ill from surface discharge pathogens, headlines across the country will scream about the dangers of onsite systems," says Stair. "Every industry professional must fight such dangerous and misguided legislation."

## Septic System Workshop

The Greene County (Ind.) Soil and Water Conservation District developed a six-hour Septic Workshop for homeowners, buyers, real estate agents, housing inspectors, loan officers and appraisers. The first workshop featured Debbie Barnhizer of the state Department of Health discussing matching onsite systems to the situation and Alan Dunn, residential sewage disposal program director for the department, explaining operating permits. The final class covered

how to close a sale on properties with failing systems.

## Alberta Strategies

The Alberta Onsite Wastewater Management Association developed an enforcement framework that identifies systems not built to code and applies corrective action. Finalization of the details was expected by late summer. The association also submitted to Municipal Affairs a revised proposal that included an extra review day added to the six-day training program, and requiring soils field classes for certification. Since some provincial permit applications are too lengthy to be practical, AOWMA designed new forms and asked an installer, inspector, and municipality to rate their effectiveness. The form they chose became the standard.

## Community Aid Spurs Education

The Iowa Onsite Waste Water Association worked with Heartland Hills Habitat for Humanity to bring onsite technology to a home on an abandoned naval base near Waverly. Doug Bird, public health sanitarian for Bremer County and IOWWA board member, coordinated the project and used it as an advanced treatment training session.

More than 30 installers and sanitarians learned about the AP-500 Set-N-Go aerobic treatment unit. Hydro-Action Industries donated the ATU and 300-gallon pump tank. Midwest Pipe Supply, Mid Country Machinery, and Advanced Drainage Systems supplied other major components. Equipment and labor were donated by Crystal Heating and Plumbing, Deike Excavating, Municipal Supply, River to River Onsite Septic Solutions, Wikner Trucking and Toby's Dirt Work.

## Beavers Threaten Onsite System

A beaver dam in a 48-inch culvert in Southborough, Mass., caused floodwaters to back up and threaten a resident's onsite system. The low-lying area usually floods at least once a year even when the culvert is clear. Workers from the Department of Public Works inserted three pipes to restore flow until the Board of Health approved a 10-day emergency trapping permit. The state banned beaver trapping in 1996.

## CALENDAR OF EVENTS

### Oct. 11-12

Delaware On-Site Wastewater Recycling Association Technical Conference and Exhibition, Dover Downs Hotel & Casino, Dover. Call Ben Miller at 302/383-5391 or visit [www.dowra.org](http://www.dowra.org).

### Oct. 11-12

Delaware Onsite Wastewater Recycling Association 15th Annual DOWRA Conference and Exhibition, Dover Downs Hotel & Casino, Dover. Exhibitors, presenters and attendees may download the registration form from the website, [www.dowra.org](http://www.dowra.org), or contact Ken Walsh at 302/436-8822.

### Oct. 27

Maryland Onsite Wastewater Professionals Association, conference on Onsite Systems -- Perspectives on Nitrogen Impacts to the Chesapeake Bay, Best Western Travel Plaza, Baltimore. Presenters will offer views on onsite system nitrogen discharges in relation to population growth in Maryland. Manufacturer exhibits will be available. The conference serves as the Annual Meeting and members may propose and vote on new board members. Call 410/633-9500.

## TRAINING & EDUCATION

### 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:

- Nov. 16-18 – Advanced Installer II
- Dec. 1-2 – Continuing Education

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 Arizona Onsite Wastewater Recycling Association in sponsorship with the University of Arizona Onsite Wastewater Education Program has an Advanced Soil and Site Evaluation class on Nov. 2-3 in Payson. Call Kitt Farrell-Poe at 520/621-7221, email [kittfp@ag.arizona.edu](mailto:kittfp@ag.arizona.edu), or visit [www.ag.arizona.edu/waterquality/onsite](http://www.ag.arizona.edu/waterquality/onsite).

### California

The California Onsite Wastewater Association is offering these NAWT classes:

- Nov. 1-2 – NAWT Operation and Maintenance, Part 2, Mill Valley
- Dec. 9 – NAWT Installer Training, Citrus Heights

Call Kit Rosefield at 530/513-6658 or visit [www.cowa.org](http://www.cowa.org).

### Georgia

The University of Georgia College of Agriculture & Environmental Sciences has these courses:

- Nov. 2 – Onsite Wastewater Management, Fulton
- Nov. 8 – Contractors and Pumpers, Fulton
- Nov. 15 – Contractors and Pumpers, Brunswick

- Nov. 16 – Contractors and Pumpers, Brunswick

Contact the Continuing Education Center at 770/229-3477 or [conteduc@uga.edu](mailto:conteduc@uga.edu).

## Iowa

The Iowa Onsite Waste water Association has the Basic and Advanced CIOWTS Installer Pretest Nov. 11-12 in Prairie City. Contact Alice Vinsand at 515/225-1051, [execdir@iowwa.com](mailto:execdir@iowwa.com), or visit [www.iowwa.com](http://www.iowwa.com).

## Minnesota

The University of Minnesota Water Resources Center has these classes:

- Nov. 30-Dec. 1 – General Continuing Education, St. Cloud
- Dec. 7-8 – Installer, Continuing Education, Brainerd
- Dec. 8 – Pipelayer Certification, Brainerd
- Dec. 13-14 – General Continuing Education, Mankato

Call Nick Haig at 800/322-8642 or visit [www.septic.umn.edu](http://www.septic.umn.edu).

## Missouri

The Missouri Smallflows Organization has these CEU courses:

- Nov. 9 – Pumps, Panels, and Electrical, Cape Girardeau
- Nov. 10 – Earthen Structures, Cape Girardeau
- Nov. 15 – Selling Systems, Branson
- Nov. 16 – Aerated Treatment Units, Branson
- Dec. 6-7 – Operations and Maintenance, St. Louis
- Dec. 12 – Drip Irrigation, Springfield
- Dec. 13 – Pumps, Panels, and Electrical, Springfield

Call Tammy Yelden at 417/739-4100 or visit [www.mosmallflows.org](http://www.mosmallflows.org).

## Nebraska

The University of Nebraska-Lincoln Extension has these state-approved courses:

- Nov. 17 – Planning and Sizing a System, Mead
- Nov. 18 – Operation and Maintenance, Mead
- Dec. 8 – Planning and Sizing

a System, Omaha

- Dec. 9 – Operation and Maintenance, Omaha

Call the extension at 402/472-9390 or visit [www.deq.state.ne.us/WasteWat.nsf/pages/OnsitePDH](http://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:

- Nov. 3 – Rhode Island Designer Examination Prep
- Nov. 9 – AutoCALCS - Automated Support Materials for Pump Timers, Tanks, Chambers, BSF Sizing & Buoyancy Calculations
- Nov. 17 – Identifying and Managing High-Strength Wastewater
- Dec. 1 – Rhode Island Regulatory Setbacks and Buffers
- Dec. 8 – Nitrogen in the Environment and Onsite Systems
- Dec. 15 – Designing Nitrogen Removal Technologies

Call 401/874-5950 or visit [www.uri.edu/ce/wq](http://www.uri.edu/ce/wq). For soil courses, call Mark Stolt at 401/874-2915 or email [mstolt@uri.edu](mailto:mstolt@uri.edu).

## North Carolina

North Carolina State University has these courses:

- Nov. 1 – Profiling Soils, Morganton
- Nov. 3 – Water Movement and Treatment Through Soils, Morganton
- Nov. 14 – Basic System Troubleshooting, Mills River
- Nov. 15 – Pump System Field Course: Advanced Monitoring and Troubleshooting, Mills River
- Nov. 30 – Advanced Troubleshooting of Onsite System Malfunctions, Raleigh
- Dec. 6 – Inspector Field Practicum, Manteo
- Dec. 7 – Basic System Troubleshooting, Manteo
- Dec. 8 – Inspector Field Practicum, Raleigh
- Dec. 14 – Flow Equalization and Timed Dosing, Raleigh
- Dec. 15 – Pump System

Design, Raleigh

- Dec. 16 – Advanced Design Lab, Raleigh

Call Joni Tanner at 919/513-1678 or visit [www.soil.ncsu.edu/training](http://www.soil.ncsu.edu/training).

The North Carolina Pumper Group and Portable Toilet Group

are holding the four-hour septage management training and three-hour land application seminar on Dec. 10 in Raleigh. Call Joe McClees at 252/249-1097 or visit [www.ncpumpergroup.org](http://www.ncpumpergroup.org) or [www.ncportabletoiletgroup.org](http://www.ncportabletoiletgroup.org). ■

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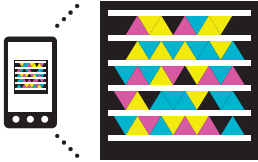
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