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in your garage?
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Percolation tests
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TEACHING *Excellence*

Kathryn "Kitt" Farrell-Poe has developed educational programs that boost onsite knowledge and professionalism in her home state of Arizona and beyond **Page 12**



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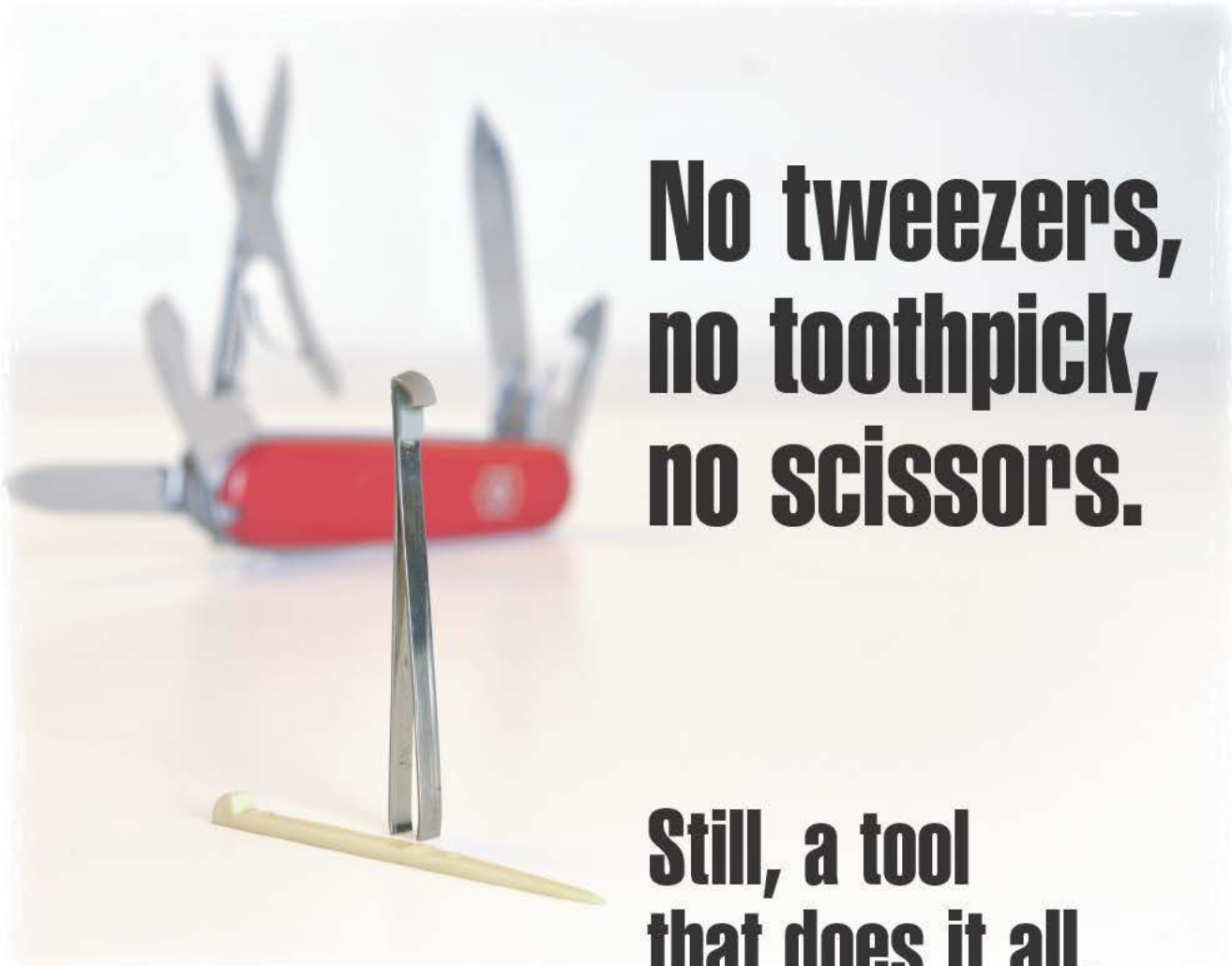
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ON THE COVER: Kathryn "Kitt" Farrell-Poe, professor at the Agricultural and Biosystems Engineering Department, College of Agriculture and Life Sciences, at the University of Arizona, is shown on a worksite where a septic tank is being installed. Farrell-Poe has left her mark on the septic system installation profession in Arizona. (Photo by James S. Wood)

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Is There a Vac Truck in Your Garage?

When the housing market slowed, some installers added pumping and maintenance to their menu of services. The move may have been a good one, and here's why.

By Jim Kneiszel



Occasionally I talk to onsite installing professionals who say they've come out from the cab of their trusty earth mover and bought a vacuum truck to pump the septic tanks they've installed. I'd say I heard more of that after the bottom dropped out of the real estate market in late 2008.

At the time, with home starts dwindling to a trickle, a number of contractors figured there wouldn't be much dirt to move so they migrated – at least temporarily – to a septic service model. They knew homeowners would be more apt to stay put in their older homes rather than start a construction project.

A ROBUST INDUSTRY

That caution among homebuyers would mean an uptick in maintenance work rather than contracts for new systems. Homeowners with older systems would plow money into repairing and restoring, and the front end of many repairs would include pumping the septic tank.

The strategy seems to have helped some installers weather the economic downturn and emerge with a good fiscal outlook as the housing picture improves. I've heard from a number of installers this spring who are

Some installers have a valued pumping partner and they wouldn't think of picking up a vac hose and hurting that relationship ... But there are others who feel they're leaving revenue on the table by subcontracting out part of a repair or maintenance job.

pleasantly surprised to be busier than they've been in years. The backlog of jobs might not match the watershed years of the mid-2000s – we may not see that frantic pace of building for some time – but the outlook is definitely much-improved.

So what's happening with septic pumping, service and repair these days? Interestingly, a recent study by CNN Money listed septic service as one of the industries with the lowest unemployment rates in America. In fact, if you're not a highly trained astronomer, physicist, or biomedical or petroleum engineer – at the top of the low-unemployment list – being a septic service technician is about as good as it gets.

According to the study, septic tank servicers and sewer pipe cleaners

enjoy a tiny .9 percent unemployment rate, compared to the national average that's been hovering in the high 7 percent range for the past year. It tied with information security analysts, nurse practitioners and earth drillers at just under 1 percent.

WHY ADD PUMPING?

Though septic service can seem like a crowded sector, depending on where you operate, the unemployment figure seems to indicate there's ample room for hardworking, skilled contractors to make a living. In recent months, I've written about lagging infrastructure improvements and an aging housing stock pointing the way to opportunities in repair work, replacement of onsite systems and the maintenance that's crucial to upkeep of existing systems.

Besides a soft economy, installers might move into pumping to:

Build stability in their business

Any construction-related business is going to have periods of feast and famine. When you're backed up with several months of excavation work in a new subdivision, you're not thinking about the lean times. If you've been in this business long enough, you can remember points when you scraped by to meet payroll or had to lay off a good employee because there wasn't enough work. Pumping can take up the slack when things are slow or Mother Nature won't cooperate and let you get in the ground. A service business related to your main focus can moderate those business ups and downs and keep your crews busy more weeks of the year.

Grab a bigger piece of the pie

Some installers have a valued pumping partner and they wouldn't think of picking up a vac hose and hurting that relationship. That's great, and there's something to be said for focusing on doing what you do best. But there are others who feel they're leaving revenue on the table by subcontracting out part of a repair or maintenance job. Landing a valued customer is half the battle, and one axiom of small business is that if you have a customer who is happy with your work, capitalize on that relationship by providing as many services as possible to that customer. Pumping can become a natural service extension to your main business if you enjoy the work and are skilled at it.

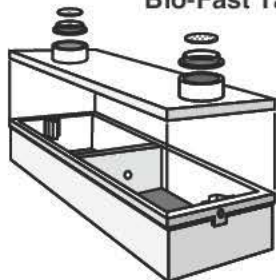
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Gain better control over workload

Let's say a customer's system is overloaded and they call you on a Sunday night. You could get out there first thing Monday morning to investigate, but you can't promise that a local pumping contractor is available at the same time to empty the tank so you can get started. If you had your own vacuum truck, you would be less reliant on another contractor and feel confident committing to emergency service. The same holds true for scheduling any service that requires a vacuum rig.

Smooth the transition into O & M

More and more, consumers value the idea of one-stop shopping. If you install their onsite system, there's an excellent chance they'd welcome you remaining involved as a system maintainer. And you'd probably feel better about the long-term viability of your new systems if you can monitor them yourself. Think of it as insurance for your installation work. As systems become increasingly complex to meet environmental demands and challenging site conditions, O & M is going to become more necessary. So if you envision yourself heading in that direction, the vacuum truck helps you provide those services seamlessly.

HAS PUMPING WORKED FOR YOU?

Is your company among those turning to pumping or system maintenance for a lifeline during slow periods? If so, how has the diversification gone for you? And as the installing business becomes your bread and butter again, will you keep on pumping tanks as a hedge against up-and-down demand for your construction-related services? Drop me a line at editor@onsiteinstaller.com and let me know. □

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editor's choice

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By Jim Kneiszel

Got a few minutes between appointments for septic system work? Is your smartphone or tablet handy on the road, or are you sitting near your desktop computer in the office? Then we have a bonus for you – additional *Onsite Installer* content is available online. Find more of the latest wastewater industry news – from product releases to videos and podcasts to my editor's blog – at www.onsiteinstaller.com. Here's just a sampling of the latest content you can find online:

THREE IMPORTANT COMPONENTS TO CONSIDER WHEN INSTALLING DRAINFIELDS

Designing a drainfield can be complex; depending on the system, there are at least three key components you need to consider — storage media, a distribution device and chamber systems for an alternative approach. You also should have observation ports, access to clean the laterals if you have a pressure distribution system, and a nose for knowing the system you designed is odor-free and working properly. The online story gets into the details.

TROUBLESHOOTING: WHAT TO DO ABOUT ODOR COMPLAINTS

A common call from homeowners involves complaints about odors either inside or outside the house. Odor can be a vexing problem and difficult to track down, so sometimes it's best to eliminate each possible cause before moving onto the next. Odor inside the house usually indicates a plumbing or vent installation problem. One common cause associated with the plumbing is an unused sink or floor drain. Another related cause for odor problems from dried out taps involves a sump pump in the lowest level of the house that pumps raw sewage up into the house sewer and out to the septic tank. Read more from expert Jim Anderson online.

EDITOR'S BLOG: GOOD JOB, OREGON ONSITE WASTEWATER ASSOCIATION!

Thanks to members of the Oregon Onsite Wastewater Association, a cancer victim will have one less crisis to worry about ... his failing septic system. A story in the Corvallis Gazette-Times explained how local onsite installers and others in the industry joined forces to replace the septic system of a 41-year-old man who had been diagnosed with three types of cancers over the years and faced \$30,000 in medical bills. Learn more about the installer companies that stepped in and helped the family in my blog. Also, don't forget to send us your state association's good news items.

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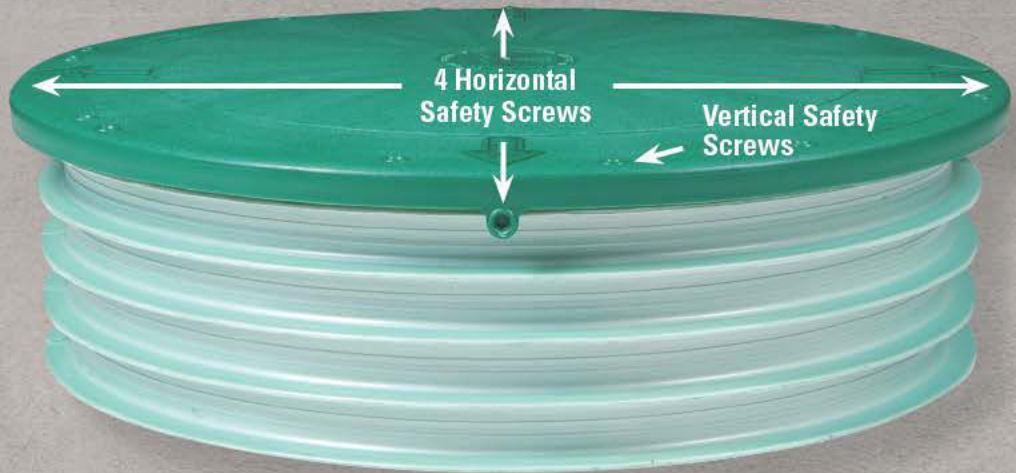
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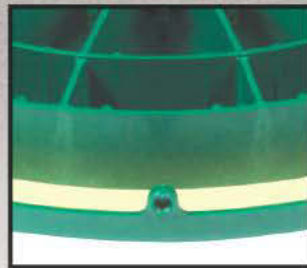
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- May also be used as Outlet Tee with Solids Deflector

Brian Lewis (left), owner of Guaranteed Contractors Inc., looks over plans with Kathryn "Kitt" Farrell-Poe for a septic system at a Green Valley home. (Photos by James S. Wood)



TEACHING Excellence

Kathryn Farrell-Poe has developed educational programs that boost onsite knowledge and professionalism in her home state of Arizona and beyond

By *Scottie Dayton*

Kathryn "Kitt" Farrell-Poe, Ph.D., liked the idea of being the only woman in the agricultural engineering course at the University of Nebraska-Lincoln.

On the first day of class in 1976, she sat in the back row and the men sat in front. The next class, she sat in the front row and the men sat behind her. At the third class, she sat in the middle, and the men encircled her. She has set the pace and the course ever since.

Her love of math, science and problem solving found perfect expression in her role as a water-quality specialist with emphasis on onsite systems. Employed as an Extension specialist and professor in the Agricultural and Biosystems Engineering Department at the University of Arizona in Tucson, she is also director of the College of Agriculture and Life Sciences (CALs) Extension Onsite Wastewater Education Program.

Her responsibilities as a Water Quality Extension Specialist include developing educational outreach programs that focus on onsite systems, safe drinking water, and nonpoint source pollution for regulators, onsite professionals, homeowners, teachers, and Cooperative Extension faculty and staff.

Elements of her work have found their way into programs of the Colorado Professionals in Onsite Wastewater and the Professional Onsite Wastewater Reuse Association of New Mexico. Conference presentations, research papers, fact sheets, videos, and DVDs by Farrell-Poe on safe drinking water

and wastewater systems populate the websites of industry professionals and association newsletters.

Kathryn "Kitt" Farrell-Poe, Ph.D.

- POSITION:** Professor, Agricultural and Biosystems Engineering Department, College of Agriculture and Life Sciences, University of Arizona, Tucson; Extension Water Quality Specialist
- EDUCATION:** Bachelor's degree, University of Nebraska-Lincoln, Agricultural Engineering; master's degree, Purdue University, Agricultural Engineering; Ph.D., Purdue University, Civil Engineering
- SPECIALTIES:** Outreach education in onsite systems, safe drinking water, and nonpoint source pollution
- AFFILIATIONS:** NOWRA, Arizona Onsite Wastewater Recycling Association, Consortium of Institutes for Decentralized Wastewater Treatment, American Society of Agricultural & Biosystems Engineers
- WEBSITE:** <http://ag.arizona.edu/~kittfp/>

Last year, CALS recognized Farrell-Poe's education accomplishments, bestowing on her the 2011 Extension Faculty of the Year award. The college presents only one such award annually.

Twist of fate

Farrell-Poe earned her master's degree in agricultural engineering from Purdue University, then worked two years at a private soil-testing facility in Lafayette, Ind., before beginning her doctoral work with the Civil Engineering Department at Purdue, specializing in environmental engineering.

Along the way she married, had a daughter and accepted a faculty position at Utah State University in the Agricultural Systems Technology and Education Department in the College of Agriculture. She earned a Ph.D. in civil engineering from Purdue in 1990.

Eight years later, her husband joined the faculty of the University of Arizona, and Farrell-Poe became associate professor in the Agricultural and Biosystems Engineering Department. While there, she recognized a new opportunity at an agricultural experiment field station in Yuma.

"Typically, industry innovators are willing to return for continuing education because they see the positive effect it has on the profession and on their businesses."

Kathryn Farrell-Poe

The state water quality Extension coordinator accepted a position elsewhere, and she acquired his job. She also inherited two grants with septic system education outreach components. "I had one lecture on septic systems while earning my environmental engineering degree, so I thought I'd better catch up fast," she says.



Kathryn "Kitt" Farrell-Poe looks at stacked sections of drainfield chambers from Infiltrator Systems at a Green Valley home.



Top (from left) Farrell-Poe, Roberto Rozco, co-owner of Arizona Precast, Brian Lewis, owner of Guaranteed Contractors Inc., and Marcus Lewis (bottom) of Guaranteed Contractors Inc. position a septic tank at a Green Valley home.

In 2000 and 2002, Farrell-Poe attended the Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT) academies and enjoyed the people. As she became more aware of the vast number of onsite systems and the importance of siting, design, installation, inspection, use and maintenance, she saw an opportunity to make a difference. But she fell in love with onsite while attending the first National Association of Wastewater Technicians (NAWT) inspector certification course in Fort Worth, Texas.

"I liked the class so much that I sponsored it for a pre-conference workshop at the 2002 Southwest Onsite Wastewater Management Conference in Laughlin, Nevada," she says. "The course is now a regular pre-conference event. It sells itself once people attend it." Farrell-Poe also became an instructor for the class.



Farrell-Poe, water quality specialist with the University of Arizona College of Agriculture and Life Sciences Extension, talks with students during her senior seminar agricultural bio systems engineering class in Tucson, Ariz.

In 2001, the Arizona Department of Environmental Quality (ADEQ) initiated onsite inspections for transfer of property, but didn't make NAWT inspector certification and continuing education mandatory until 2006. "As an associate member of NAWT, any class I offer is co-sponsored by the organization, making recertification very affordable," says Farrell-Poe. "It has certainly helped increase attendance."

ABCs of wastewater

To develop the Extension's Onsite Wastewater Education Program, Farrell-Poe received grants from EPA Region 9 and ADEQ to buy classroom and field equipment. Besides adopting NAWT and CIDWT inspection materials, she worked with Ed Swanson, then head of the ADEQ Water Quality Division, to adapt them to administrative code and to develop additional curriculum to qualify the courses for state certification. "So far, we've certified or recertified 1,568 inspectors," says Farrell-Poe.

For the first few years, she saw excitement and high interest in the new inspection courses, but then the numbers began diminishing. She attributes the decline to the vast distances that separate pumpers in Arizona. "Isolation makes them very independent, and a few resist the necessary repeat training," she says. "Typically, industry innovators are willing to return for continuing education because they see the positive effect it has on the profession and on their businesses."

Farrell-Poe also became involved with the Arizona County Departments of Environmental Health Services Association, a group of environmental

health directors. Through its onsite division, she attended soil science programs presented by Jerry Tyler, Ph.D., in the Department of Soil Science at the University of Wisconsin-Madison.

"I saw that soil and site evaluations were very important and something Arizona should have, so I developed a program with classroom and field components," says Farrell-Poe. This is her proudest accomplishment: To date, 494 people have attended those classes, and 53 more have taken Advanced Soil Treatment.

"Teaching a course a second and third time irons out the wrinkles, improving the educational experience for everyone."

Kathryn Farrell-Poe

Next came courses in Introduction to Onsite Design (99 participants to date) and Advanced Design (17), supported by manufacturers providing samples of their components. Farrell-Poe then brought the NAWT installer class to the state. When CIDWT needed a location to pilot its Operation and Maintenance course, she volunteered to coordinate the training for 20 people.

Anyone can do it

"I offered the installer course twice and had 61 attendees," says Farrell-Poe. "The turnout was good the first time and not so good the second time around. Since then, I've been unable to fill a class. Without regulatory requirements, many people won't come more than once."

"The first class I offer on any subject is always in testing mode, and I pay close attention to the evaluations on how to improve the course, handouts, *(continued)*

Web Versus Classroom

Kathryn "Kitt" Farrell-Poe teaches a three-credit online course in designing onsite systems for undergraduate and graduate students at the University of Arizona College of Agriculture and Life Sciences Agricultural and Biosystems Engineering Department. As more onsite organizations explore Web-based education, she has reservations.

"Developing a proper online course is expensive and time-consuming," she says. "It must be designed to attract people who can't attend annual conventions or other training venues. The material should be in bite-size pieces so installers and pumpers don't have to sit at computers for two hours. It also should be very interactive."

Farrell-Poe sees the benefit of online courses for people otherwise faced with traveling long distances and giving up one to three days of money-making opportunities to take a class. The benefit of that increases with the price of gasoline.

"We need a thorough market analysis to see if online classes would be viable, but those studies are expensive," she says. "We need to know how many people would enroll in online courses, how much attendees should pay for them, and even how we provide access to online subscribers."

While classroom studies convert well to the Web, field components do not. "Shooting quality video demands a professional videographer, an experienced editor, and lots of money," says Farrell-Poe. "We need to think out of the box. I lean toward putting beginning or remedial material online, and leaving advanced courses with field components for in-person venues."



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presentations, topics covered, and even the location of the classes. Teaching a course a second and third time irons out the wrinkles, improving the educational experience for everyone.”

Inspired by centralized training centers in New England and Texas, Farrell-Poe established the Onsite Wastewater Training Facility at the Maricopa Agricultural Experiment Station. “Civil and environmental engineering professor Paul Trotta, Ph.D., was opening a training center at Northern Arizona University,” she says. “I thought it would be great to compare his cold, high-elevation, arid-condition center with my low-desert, warm-weather, sandier-soils center. That was before I knew better.”

“The people who do it correctly, get the education, and abide by the rules are really interested in leveling the playing field, which can only be done through regulation.”

Kathryn Farrell-Poe

Although the facility was 25 miles from the city, it represented 90 percent of the state’s climate and soils. Farrell-Poe held an installer class and soils class at the center, but attendees found the location inconvenient. “I planned to do more training there, but realized the vastness of our state made a centralized location impractical,” she says. “It’s easier for me to travel to a group of people than to have them come to the facility.”

Using what is there

Farrell-Poe is reluctant to claim that her influence extends beyond the state; she prefers to note that New Mexico has increased its education program as its regulatory scheme becomes more like Arizona’s. “I think the Colorado onsite association modeled its soil and site evaluation course from ours, but I don’t know if they used our entire program,” she says.

According to Farrell-Poe, the quickest way for states to develop training programs is to bring in CIDWT and NAWT courses. “In addition, I have all kinds of agendas and ideas that I’m willing to share, and I’d be happy to help groups with their materials,” she says. “I’ve kept break-even cost tables and can give them clues as to what has and hasn’t worked for me.

Besides her Extension duties, Farrell-Poe is a professor and instructor. Using a university grant, she worked with Trotta to develop a three-credit online course, Design of Onsite Wastewater Treatment Systems, for undergraduate and graduate students. “I’m also proud of that class, which I’ve taught every other spring semester since 2001,” she says. “I’m probably one of the first in the university system to have such a course.”

Homeowners and regulations

As a Water Quality Extension Specialist, Farrell-Poe is involved with private wells, safe drinking water, and educating homeowners about their onsite systems. She has written numerous fact sheets for handouts at homeowner seminars or for professionals to download, print, and pass to customers.

The information has been distributed on industry websites across the country, often without a byline. Farrell-Poe’s latest article, *10 Things Realtors Should Know about Septic Systems*, coauthored by Dawn Long, was published in the May 2012 issue of *Arizona Realtor* magazine.



Kathryn “Kitt” Farrell-Poe talks with a student during her senior seminar agricultural bio systems engineering class in Tucson.

Besides serving on the board of the Arizona Onsite Wastewater Recycling Association, Farrell-Poe is on the ADEQ and Pima County Onsite Wastewater Advisory Committees, and is a nonvoting member of the Onsite Technical Advisory Group (OTAG) of the Arizona County Departments of Environmental Health Services Association.

“These groups are promoting professionalism throughout the onsite industry,” she says. “Currently, only inspectors for the transfer of ownership program and soil and site evaluators must be certified. We’re requesting regulations that require education and certification for installers, service providers, and designers.”

Farrell-Poe also is promoting regulations that will standardize the language based on the CIDWT onsite glossary, while OTAG is revising the ADEQ transfer of ownership inspection form. “I’m hoping the regulatory certification requirements will allow reluctant people to realize the worth of continuing education, and from then on they will be inspired to grow professionally,” she says.

After 11 years of implementing her program, Farrell-Poe sees an increased interest in professionalism. “The people who do it correctly, get the education, and abide by the rules are really interested in leveling the playing field, which can only be done through regulation,” she says. “I find that extremely gratifying. So is seeing a heightened awareness among regulators, homeowners, and real estate agents identifying the correct things to do, then doing them.” □

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The Show-Me Association

An active volunteer board of directors steers Missouri Smallflows Organization toward professional development and training on new systems

By **Scottie Dayton**

Developing an educational program for installers, engineers, service providers, soil evaluators and regulators was the prime objective of Janet Murray when she became president of the Missouri Smallflows Organization in 2006. Murray, a registered environmental health supervisor and regulator for the Randolph County Health Department in Moberly, Mo., wanted a program that extended beyond the half dozen courses offered at MSO annual conferences.

“Onsite professionals need 12 hours of continuing education every three years for state registration or license renewal,” she says. “The Missouri Department of Health and Senior Services sets the standards and offers a few courses, but MSO does the majority of training.”

The organization incorporated in 1995, one year before the new code requiring continuing education became effective. At the time, the state had 3,500 installers. Today, it has about 2,000 registered installers (half of whom are licensed to install advanced treatment systems), 65 soil evaluators, and more than 200 licensed inspectors for property sales.

“The person who made the biggest impression was a former board member in bib overalls and a baseball cap. He advised the hearing committee to retain the educational component because it helped installers keep up with the changing industry. The impact of his testimony derailed the proposal.”

Janet Murray

Conferences have expanded from one day with one educational track to two days with three consecutive tracks on effluent dispersal and water management, earthen structures, troubleshooting, hydraulics for pressurized systems, basics of onsite, design engineering, drip irrigation design and installation, and the Consortium of Institutes for Decentralized Wastewater Treatment operation and maintenance course. As the status of MSO conferences rose, it attracted the heavy-hitters of onsite as speakers. In 2012, the state attorney general gave the keynote address on his study of water quality issues at Lake of the Ozarks.

Just warming up

A volunteer board of directors organized the conferences and educational programs, tracked CEUs for 250 to 300 members, published a quarterly newsletter and managed the association’s daily demands. By 2008, the workload overwhelmed them and they hired a paid executive director.

To meet demand for more and better courses, the MSO formed the Institute of Learning Committee. Members such as Randall Miles of the University of Missouri, Dennis Sievers of the United States Department of Agriculture Rural Development, and Tom Fritts, president of the National Onsite Wastewater Recycling Association, developed new training programs.

“Their wonderful work extended beyond annual conferences, enabling us to send trainers throughout the state with one- and two-day presentations equaling six to 12 hours of training,” says Murray.

The program originated after a legislator proposed eliminating the educational requirement in response to complaints from some constituents that classes were never offered in their area. “I and other members of the board of directors testified against the proposal, but the person who made the biggest impression was a former board member in bib overalls and a baseball cap,” says Murray. “He advised the hearing committee to retain the educational component because it helped installers keep up with the changing industry. The impact of his testimony derailed the proposal.”

Tammy Trantham replaced the executive director in 2010. As the MSO executive secretary, she coordinates with local county health departments on what classes the installers need or are requesting. She then hires the instructor and registration assistant. The organization’s website lists the next six months of classes. By 2014, all MSO courses should be online.



Janet Murray

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"Our biggest challenge will be developing classes that address changing technologies," says Murray. "Most of our educational programs are five years old, so it's time for new ones."

Another MSO educational program is the Daryl Brock Scholarship for high school students seeking higher education. Two \$500 scholarships are awarded to members' children annually.

Some of those recipients are now taking over their parents' businesses, but many more are entering the industry as newcomers. "It surprises me, but every year I see an influx of youth into MSO to replace retiring professionals," says Murray. "One reason could be the bad economy. It forced contractors who did installations as a sideline to subcontract the work, and that is attracting young men and women to the field."

Call to action

Because MSO has always responded to legislation rather than help to write it, staying abreast of proposed regulations is important. To do that, Murray receives weekly memos from the Missouri Association of Local Public Health Agencies legislative committee, then alerts the membership to relevant issues.

Murray also works with the Randolph County Onsite Wastewater Review Committee to revise septic rules. A recent accomplishment was passing an ordinance requiring a permit to install onsite systems on properties of more than three acres. The state law exempts them from needing a permit. "MSO would like to see the three-acre exemption removed from the law," she says.

One element missing from the organization is a community outreach program. Murray envisions it to include installing systems for low-income families as a field day with CEUs, and having a booth at the State Fair and other venues to give homeowners information about their onsite systems. "It would behoove us to look in those directions," she says. "Some members have installed systems for Habitat for Humanity, but it was not an MSO venture."

Murray wants MSO to receive some of the money the U.S. Environmental Protection Agency grants annually to fund municipal sewers. "Not many groups go after the money because the agency set up the program with so many onerous qualifications," she says. "It shouldn't be that difficult to assist needy homeowners with failing systems. Somehow, we must open that door."

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Rocky Mountain High

A fixed activated sludge treatment system is the solution for a Colorado lodge with poor soils and steep slopes

By **Scottie Dayton**

Effluent running out of the observation port and ponding in the drainfield alerted the manager of Echo Lake Lodge in Idaho Springs, Colo., to a serious problem. The lodge has a full commercial kitchen, 45-seat restaurant, and gift shop.

The lodge owner, Denver Parks and Recreation, hired a pumper to clean the 2,000-gallon septic tank twice a week as officials searched for a solution. An employee at Denver Water recommended All Service Septic, an engineering/design firm in Arvada. “We don’t have soil here; we have primarily bedrock,” says co-owner Richard Petz, P.E. “The problem was high-strength waste discharging to a moderately over-excavated drainfield that couldn’t treat it.”

The lodge, located at 10,600 feet elevation on a mountain in the Arapaho National Forest, is open May through September and experiences frequent two- to three-hour power failures. The replacement system had to handle high-strength waste, intermittent heavy flows, require minimal maintenance, and start up immediately when the lodge opened in spring. “Our biggest challenge was holding the design below 2,000 gpd to keep the price affordable,” says Petz.

SYSTEM PROFILE

Location:	Idaho Springs, Colo.
Facility served:	Echo Lake Lodge
Designers:	Richard Petz, P.E., All Service Septic, Arvada, Colo.
Installers:	Jeff Long, Esco Construction Co., Evergreen, Colo.; Tim Petz, All Service Septic
Site conditions:	Highly weathered fractured metamorphic bedrock, percolation rate 10 to 30 minutes per inch
Type of system:	MicroFAST system, Bio-Microbics
Hydraulic capacity:	1,999 gpd



An Esco Construction Co. backhoe operator lifts the 1,600-pound Bio-Microbic's HighStrengthFAST 4.5 bioreactor as Leo Castro of All Service Septic helps steady it. (Photos courtesy of All Service Septic)



ABOVE: The 21- by 100-foot-long drainfield lies next to, but down gradient, from the old bed. The mountainside has a 20 percent slope. **BELOW:** Located 30 feet away, the blower introduces air into the treatment tank at 90 to 140 cfm.

Petz chose a FAST (fixed activated sludge treatment) unit from Bio-Microbics. The only moving part in the aerobic, packed-bed bioreactor is an above-ground blower. Because the lodge manager wanted minimal interference with tourist traffic, installation began in September, with its genuine possibility of snow and no rescue by county plows.

Site conditions

Soils are highly weathered fractured metamorphic bedrock with a percolation rate of 10 to 30 minutes per inch. Echo Lake Park is on the National Register of Historic Places, and its pristine lake is renowned for fishing and wildlife.

System components

Petz designed the passive gravity system to handle 1,999 gpd with an average flow of 1,200 gpd. Major components are:

- 1,250-gallon two-compartment concrete grease interceptor, with tanks from Colorado Precast Concrete
- Existing 2,000-gallon two-compartment concrete septic tank
- 3,250-gallon two-compartment equalization tank with SaniTEE effluent filter
- 7,000-gallon tank with HighStrengthFAST 4.5 (4,500 gpd) treatment system (Bio-Microbics)
- 1,000-gallon tank with 3-inch automatic dosing siphon (Fluid Dynamic Siphons)
- 2,100-square-foot pipe-and-gravel drainfield

System operation

Laterals and lines connecting the tanks are SDR 35 4-inch PVC pipe. The kitchen lateral connects to the grease interceptor, then to the septic tank. The sanitary lateral plumbs to the septic tank.

Liquid flows from the septic tank to the equalization tank to the treatment tank, where air introduced from the blower at 90 to 140 cfm vigorously circulates effluent through the treatment zone's channeled flow paths. Bacteria attached to the stationary media metabolize nutrients and provide nitrification/denitrification.



Treated odorless effluent flows to the dose tank, where the siphon converts small, continuous flows into large intermittent doses. When the siphon trips, 200 gallons discharge 220 feet through 3-inch pipe to a manifold that distributes the dose to three 4-inch laterals 100 feet long, 6 feet apart, and spaced 3 feet from the sides of the trench. Drilled 18 inches on center, the 3/8-inch orifices face down at 5 and 7 o'clock positions. Effluent is 30 mg/L BOD and TSS or less.

Installation

Project manager Kelly Smith of Roth Sheppard Architects in Denver oversaw the installation. Denver Parks and Recreation subcontracted Esco Construction Co. in Evergreen to install the tanks and drainfield. Co-owner Tim Petz and assistant Erik Hamilton from All Service Septic supplied and installed the treatment unit.

BELOW: The open underside of Bio-Microbics' HighStrengthFAST 4.5 bioreactor. **RIGHT:** Looking at the 3,250-gallon equalization tank with HighStrengthFAST 4.5 treatment system, and the 1,000-gallon dose tank. The mountainside has a 20 percent slope.



"The replacement drainfield was tricky because it was next to and down gradient from the old one. They were cutting into and working on the side of a mountain with a 20-percent slope."

Richard Petz

The first challenge was finding equipment that could navigate the winding mountain roads. Contractors staged the equipment in a small side parking lot. Installation began with the drainfield, as there was no opportunity to close the restaurant during the switch over. "As soon as we hooked up the tanks, the new system had to handle flow," says Petz.

Denver Parks and Recreation marked trees to remove, then Esco cut and sawed them into firewood for the lodge. To meet the state's required 4-foot separation from bedrock, the driver of the Komatsu trackhoe excavated a 100- by 21-foot-wide trench 8 feet deep at the head and 6 feet deep at the toe.

"The replacement drainfield was tricky because it was next to and down gradient from the old one," says Petz. "They were cutting into and working on the side of a mountain with a 20-percent slope."

As Esco excavated the highly weathered bedrock, it broke into granular material, which was stockpiled and used for filter material. "Having this source saved about \$50,000 in septic sand," says Petz. Esco bedded the excavation with 4 feet of it, added 12 inches of gravel, laid the three laterals, and covered the drainfield with geotextile to prevent soil from washing into the gravel. They backfilled to grade with native topsoil.

After the pumper serviced the septic tank, Esco tested it for watertightness and it passed. Meanwhile, workers removed the restaurant's two small grease interceptors and installed the new tank. Petz added another baffle to increase retention time and pull more grease out of solution.

"We had considered metering the highly variable flows, but decided against such pumps because of the remoteness," he says. "So, we added extra tankage to accommodate the flows."

To set the tanks, Esco hired a crane, which barely made it up the mountain. A semi-tractor truck shortened to navigate the turns brought the treatment unit. Tim Petz and assistant, Erik Hamilton, screwed and glued the 20-inch-long legs to the bottom of the unit as the backhoe suspended it.

"We attached the exterior legs first, then set the tank on the ground with the backhoe still supporting it and attached the inner legs," says Petz. Assembling the treatment kit took four hours.

Then they assembled the blower and located it 30 feet from the tank. If the area experiences extended blackouts, a generator at the lodge will power the blower. After the system passed its final inspection, Esco activated it. Tourists at the lodge were unaware of the switchover.

Maintenance

All Service Septic holds the two-year service contract. Each September, Petz monitors the sludge in the tanks with a Sludge Judge and makes sure the blower action in the treatment zone looks appropriate. He cleans the bug screen on the blower, checks the liquid level in the dosing tank to guarantee the siphon is working, and looks for excessive moisture in the drainfield. □

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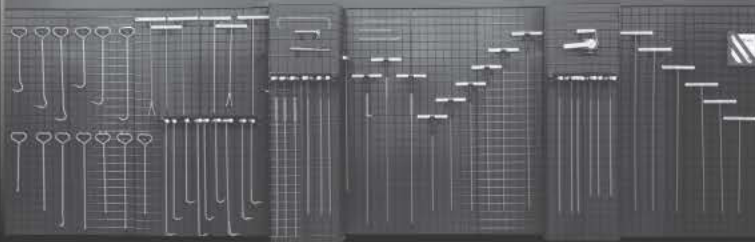


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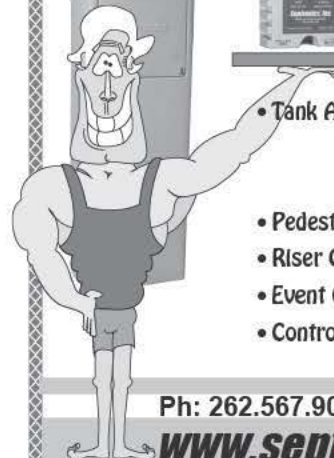
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Jim Anderson, Ph.D., and David Gustafson, P.E., are connected with the University of Minnesota onsite wastewater treatment education program. David is Extension Onsite Sewage Treatment Educator. Jim is former director of the university's Water Resources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

Don't Rely Only on the Percolation Test

Though they've fallen out of favor for soil evaluation, percolation tests remain a good assessment tool when combined with other on-site observations

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

This is the last in a series of four columns on site evaluation based on our presentations at the last Pumper & Cleaner Environmental Expo in February.

One of the tools used for site evaluations in the past is the percolation test. This test has fallen into disfavor to determine soil hydraulic loading rates primarily. In fact, some states now do not allow the test to be used. We feel the test is still a useful tool to evaluate soil and can help resolve some problem situations. For instance, the percolation test is useful to evaluate the soil permeability relationship when the soil has been disturbed. Disturbed includes situations where the system is going to be installed in fill soil, and where there has been smearing and compaction due to construction activities.

STUDY THE SITE

In the case of fill, any soil with a texture finer than loamy sand will exhibit dramatic reductions in the ability to accept septic tank effluent when it has been moved from one site and deposited in another. The lack of distinct soil horizons, changes in vegetation type and soil colors that are different than natural profile colors are ways to identify a fill site. Soil texture and structure are not reliable indicators of the ability of these soils to accept effluent.

Relationships between a percolation test and soil texture have been established, and up until recently were used to determine soil hydraulic loading rates. In the process of placing soil on the site, the material may have been subject to compaction, which would result in lower percolation rates and lower soil hydraulic loading rates.

When the soil has been too wet to work, the backhoe bucket often smears the sidewall. Smearing sidewalls can also take place when the moisture content of the soil is considered OK. Smearing generally is relatively thin, approximately 1/8 inch thick. This has the opportunity, with careful

BELOW: A site evaluator conducts a soil percolation test. RIGHT: A soil sample shows the distinct mottled appearance of redoximorphic features indicating periodic saturation at this depth.



excavation, to be removed. Compaction on the other hand can affect the soil over much wider areas and to a deeper depth. It is often associated with working in wet soils. It is usually caused by either heavy equipment traffic or in areas where materials have been stockpiled.

If the fill or compacted soil has been in place for a while, it can be difficult to identify. But a lack of structure and different soil materials found nearby are reasons to be cautious about using only a soil evaluation to establish the loading rate. If there are not clear horizons, there is unclear or a lack of soil structure characteristics and the soil seems harder to dig, a percolation test will confirm or give another estimate of the soil hydraulic loading rate.

LOOK AT ALL SOIL FACTORS

There are several reasons the percolation test has fallen into disfavor. One is the variability of the results obtained, even from one hole on a site to another. Also, the test in some places was used as the sole deciding factor about whether a system should be installed. This approach ignored all the other

Results from Minnesota tests cannot be compared to Arizona results because the hole size is different. The point to be made is: Know your state rules and follow them consistently, recognizing you cannot simply compare numbers between areas where the test is conducted differently.

important factors of soils including periodic saturation, dense layers and landscape position. Using percolation-only criteria set up a large number of systems for failure. Of course, this may be due, in part, to the attitude held for a long time that onsite systems were nothing but temporary solutions until the big pipe arrived.

To make the percolation test a useful tool for tough situations, it is important to recognize the test must be conducted consistently and with no shortcuts. If this is done over a period of time and a number of sites, the site evaluator and local government inspectors will develop a body of knowledge about the soils and conditions in their area. This is invaluable to the design and installation process

One thing we find interesting in our travels is the wide variation of the percolation tests we see. The test itself was established in the 1920s and then captured in early health codes. However, using two of the states we work in as examples shows how different this test can be depending on location.

In Minnesota, an 8-inch-diameter hole is required to the depth of the infiltrative surface of the system. The hole will be formed using a fence post auger, a

(continued on page 27)



As in this case, where a tracked vehicle has disturbed the soil surface, a percolation test can help determine soil sizing factors.

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Creator of the Bull Frog Industries suitcase jetter tells Expo visitors that good things come in small packages

By Craig Mandli

Jason Coleman believes name recognition leads to sales. So when the sewer and pipe-cleaning industry veteran chose a name for his new suitcase-style jetter, he went humorous, calling it the Crap Shooter. “It definitely sticks in your mind,” says Coleman, the founder of Bull Frog Industries in Aurora, Colo.

“Let’s face it, this is an industry that is pretty easy to poke fun at. We’ve developed a product that we’re very serious about, but having a lot of fun with, too. Honestly, the name was more a working title during the beta testing phase last year, and it just kind of stuck.”

“I think a lot of people are surprised that we can offer this kind of performance out of something so light and easy to handle.”

Jason Coleman

The diminutive 1,500-psi jetter was introduced at the 2013 Pumper & Cleaner Environmental Expo International in Indianapolis. It can be powered using a common 15-amp circuit, meaning contractors are not spending time searching for a high-amp power source. Coleman says the device’s convenient features and notable moniker kept Expo attendees flocking to Bull Frog’s booth.

“I think a lot of people are surprised that we can offer this kind of performance out of something so light and easy to handle,” says Coleman. “We designed it to fill a gaping hole in the industry.”

Coleman says he went to work designing the Crap Shooter after working with other portable jettors in his family sewer and drain-cleaning business. “We have worked with so many different jettors that we found were heavy and bulky, or never quite worked how we needed them to,” he says. “We took more than 30 years in the family business into account, and this was the result. We couldn’t be more excited.”

The jetter features a 50-foot high-pressure hose with quick connect, and two heavy-duty nozzles (named the Flusher and Thruster) that enhance the performance of the unit. Designed to clear up to 4-inch pipes, the unit comes with two faucet adapters for versatility in many applications. Components and hoses can handle up to 120-degree water temperature, and the unit is packed in a heavy-duty case with a carry handle. The total weight of the unit is 21.4 pounds.

“I think people assume that because it weighs so little, it’s going to be cheaply constructed,” says Coleman. “That’s not the case at all. This jetter is designed to stand up to the rigors of the job, and make life easier for sewer and drain cleaners that need to get into tight spaces. We haven’t encountered



Jason Coleman, founder of Bull Frog Industries, explains the features of his suitcase jetter on the exhibit floor of the 2013 Pumper & Cleaner Environmental Expo International.

a small-diameter pipe-cleaning job yet that we haven’t been able to tackle with it.”

Coleman says he had many offers to purchase his prototype model on display at the Expo, and the company took several orders. Coleman also signed deals with several distributors during his time at the Expo.

“The Crap Shooter definitely had the reaction we were hoping for, and more,” says Coleman. “We figured that the Expo would be the right choice to really roll things out. A lot of the people we spoke with were excited to hear about the product, and I’m always excited to talk about it.”

Coleman says the Bull Frog crew is already planning to make a big splash at the 2014 Expo – with a 3,000-psi electric jetter they’ve named the Crap Shooter II. “We’ll definitely be back in Indy in 2014,” says Coleman. “We had a lot of fun at the 2013 show.” 303/338-0805; www.bullfrogind.com. □

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(continued from page 25)

common tool that provides a consistent hole. In Arizona, the evaluator is required to construct – without disturbing the soil structure – a 12-inch square hole or a 15-inch-diameter round hole. The most common approach is to use a 5-gallon bucket with holes in it to line the 15-inch-diameter hole. This means results from Minnesota tests cannot be compared to Arizona results because the hole size is different. The point to be made is: Know your state rules and follow them consistently, recognizing you cannot simply compare numbers between areas where the test is conducted differently.

A USEFUL TOOL

A key area of the test is the requirement that if the soils are any texture other than sandy, the holes need to be presoaked. The rationale for this is that if the evaluator starts with a “dry” soil and the soil has a percentage of clay particles, it takes time for those particles to swell, reducing the percolation rate and more closely mimicking what happens in the soil when effluent is applied on a consistent basis. We see people always trying to shortcut this activity, which causes test results with faster rates.

If the evaluator is using this test to confirm or adjust loading rates due to the factors discussed above, this can lead to large over-estimates of the ability of the soils to accept effluent, resulting in systems that are much smaller in size than they should be. Regarding the pre-soaking, both states require maintaining a depth of water 12 inches above the bottom of the hole for a minimum of four hours and then coming back 16 to 30 hours later after the soil has had a chance to swell, to run the test. This obviously adds a lot of time to the process, which is why many take shortcuts.

The bottom line: We see this test as a useful tool if it is used and performed properly and consistently. □

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Louisiana installer and system inspector indicted in bribery case

By Doug Day and Scottie Dayton

A former septic tank installer and a former state inspector in Louisiana are under indictment in federal court in a bribery case. The U.S. Attorney's office filed the charges against 71-year-old Glenn Johnson and 52-year-old Alan Pogue. According to the indictment, Pogue, former state septic system inspector, would provide Johnson with a list of applicants for septic installation permits. Johnson would use that information to solicit business from those people. A series of bribes totaled a reported \$50,000.

Calcasieu Parish is inspecting every rural home septic system to prevent pollution and educate people about proper operation and maintenance. According to the state Department of Environmental Quality newsletter, the Parish Police Jury (county board of commissioners) has five trained inspectors for the five-year program. They will examine about 33,000 septic systems; homeowners are given about a week's notice.

Inspectors look at accessibility, electrical connections, operation of the aerator motor, sludge depth and the condition of the discharge. Homeowners can also ask questions of the inspectors.

If a system fails inspection, the homeowner is given information about how to fix or upgrade it. If they can't afford the cost, assistance is available through the Parish Community Services office, which receives grant money from USDA Rural Development.

Through October 2012, 15 percent (4,925) of systems in the parish had been inspected:

- 2,942 mechanical systems passed
- 1,250 mechanical systems failed
- 600 "other" systems passed
- 133 "other" systems failed

Indiana

A bill making its way through the Indiana legislature would prevent forming regional sewer districts if the majority of property owners object. House Bill 1497 was approved by the Assembly 88-2 and by the Senate 35-11. Another proposal, Senate Bill 205, has passed through one committee successfully. It would require board members of regional sewer districts be elected rather than appointed, and that they be ratepayers of that district. Yet another law supporting the use of septic systems has made its way through committee. Senate Bill 204 would change the rule requiring people to connect to a sewer system that is within 300 feet of their property line. Instead, the 300-foot requirement would be measured from the discharge point of the home.

Pennsylvania

Proposed regulations by the Pennsylvania Department of Environmental Protection aimed at reducing nitrate pollution in streams with the highest

water quality rating would impose stringent rules on onsite systems. Developers would be required to prove that projects won't degrade water quality in streams classified as exceptional. Critics in the legislature say the proposed rules are based on unproven science, will hamper growth in three counties, be difficult and costly to enforce, will depress the job market, devalue premium properties and raise taxes.

New Jersey

New Jersey passed a law prohibiting healthcare facilities from discharging prescription medications into onsite systems or sewers in certain circumstances. The law provides for civil administrative penalties for violations.

Ohio

Proposed rules from the Ohio Department of Health would enable homeowners to use onsite technologies not recognized under the current 1977 rules. The draft rules would provide six distribution options, three site drainage mechanisms, 10 methods to reduce soil depths, and more than 40 pretreatment products. The new rules should become effective on Jan. 1, 2014.

New Hampshire

The New Hampshire Supreme Court issued a decision in *State v. Guay*, holding that the defendant's unlawful operation of a septic system is subject to civil fines and criminal penalties. An investigation by the state Department of Environmental Services revealed liquid on top of the defendant's drainfield and a garden hose attached to a sump pump discharging brown liquid toward a river. The state charged the defendant with one misdemeanor of unlawful maintenance of an onsite system.

Minnesota

The Minnesota Pollution Control Agency allowed counties to use components of the current Rule 7080 and revised Rule 7080 through 7083. Current Rule 7080, established in 2006 and destined for revision by 2014, provides the baseline statutes for administering an onsite program. The revised rule governs systems larger than 2,500 gpd, those linking multiple homes, and systems serving restaurants. It will be modified using much of the current rule for systems treating less than 2,500 gpd. This approach will simplify design and installation costs for most systems. □

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Alarms, Controls and Monitor Systems

By Craig Mandli

Intelligent pump control panel

The Intelligent Pump Control (IPC) Panel from Aquaworx by Infiltrator uses pressure transducer technology to monitor multiple types of system events and enhance pump system performance. An embedded microprocessor and floatless pressure transducer in the pump chamber monitor liquid levels, control pumping time intervals, and log events in real time. With the Mountable and Removable Controller (MARC), installers and service providers have the option of removing the unit to use on multiple panels. The panel will store up to 4,000 events and calculate daily system flow. 800/221-4436; www.infiltratorsystems.com.



Switch connection

The Universal Vertical Reed Switch Connection from Bear Onsite allows the SJE Rhombus VRS switch or Alderon Industries new switch to be placed on the unfiltered side of any effluent filter or tee-baffle to signal a high water condition. The elliptical switch connection allows the tabs to pass through the upper side of the connection; the user then rotates the switch 90 degrees so they pass over the "retaining bumps" which hold the switch in place until it is depressed and the direction is reversed to remove it. 877/653-4583; www.bearonsite.com.



Plunger-style control panel

The Minuteman level alert from CSI Controls is a pedestal-mounted, plunger-style control panel featuring a built-in high water alarm with 9-volt battery backup alarm system. It features an internal outlet for piggyback pump operation and an external test/silence/normal operation switch. The flashing red LED alarm light and high-decibel horn activate when a potentially threatening alarm condition occurs. The weatherproof poly enclosure and pedestal protect the components and wiring from the elements. The pedestal features a removable access door for easier wiring. The post can be mounted in the ground, directly over a 4-by-4 inch wooden post or conduit. 800/363-5842; www.csicontrols.com.



Intelligent valve monitor

The IVM6000-LP intelligent valve monitor from Dynamic Monitors is an electronic monitor and early-warning alert system for all third-party 6000 series mechanical distributing valves. It confirms even distribution to all zones and early detection and immediate alert of valve malfunctions. Replace the valve's original rubber disk and stem assembly with the one supplied with the monitor, then slip the monitor over the valve and supply low voltage power. Connect the dry contact alarm output to a standard third party pump control panel and it provides notification of any valve malfunctions. 888/747-7645; www.dynamicmonitors.com.



Duplex control system

PDC Series panels from Liberty Pumps control the operation of two ProVore residential grinder pumps. The system includes a primary pump control float and an alarm float. LED indicators show power on, pump run status, alarm status, and horn enable/disable status. Pumps are protected with a manual reset fuse to isolate a failed pump. Features include NEMA 1 indoor-rated enclosure, plug-in ready wiring, factory-wired floats with quick-disconnect at the box, audible and visual alarms, and 9-volt alarm backup. Receptacles are angled to accept standard or right-angled plugs and an automatic 6-hour run limiter protects against run-dry or runaway pump conditions. 800/543-2550; www.libertypumps.com.



Pump system control panel

The 4-in-1 Controller from Orenco Systems supports numerous electrical configurations and dosing schedules within a single panel. Both simplex and duplex models are available, and can be configured in the field for timed or demand dosing. While the control circuit operates on 120-volt power, the pump circuit is dual-rated for 120- or 240-volt power, meaning reduced panel inventories for new installations and repairs. They include a programmable logic unit (PLC) with multiple timing intervals for changing flow conditions, as well as a built-in elapsed time meter and counter. The PLC also displays float position and has a float error indicator. Each panel includes a reference chart to assist with troubleshooting during installation and testing, as well as wiring diagrams. 800/348-9843; www.orenco.com.



Filter Alarm

The 3014AB wired indoor/outdoor filter alarm from Polylok provides audio/visual warning for home or business owners that a septic tank filter needs cleaning. It activates when the filter cartridge is at approximately 90 percent capacity of solids build-up. Features include manual alarm test switch and horn silence, an alarm horn rated to 82 decibels at 10 feet, and 15 feet of cable with longer lengths available. 877/765-9565; www.polylok.com.



NEMA-rated control panel

Control panels from Quanics include simplex- and duplex-demand or timed-dose versions. Each standard panel is configured to accept either 115- or 230-volt pumps and are built in NEMA 4X rated enclosures. The standard drip irrigation controller includes connections for external solenoid valves to allow for automation in the drip management system. Custom panels are available for applications



including remote telemetry, counters, multi pump alternation, heaters and logic controllers. 877/782-6427; www.quanics.net.

High water alarm

The Observer 500 from SPI - Septic Products is an indoor/outdoor high water alarm featuring a durable thermoplastic enclosure, 360-degree alarm light, alarm horn, alarm test and horn silence buttons, and a 6-inch 120-volt power cord. External cord grips allow for easy installation, and a mechanical float with a 15-foot cord is included. It is covered by a two-year limited warranty. 419/282-5933; www.septicproducts.com.



Aerator Timer

The PI01FA-2 Timer from Septic Services is designed for Flagg-Air 340HP Aerators, but can be used for any application that requires 7-amp shut-off capability. It is designed for indoor and outdoor use, and is constructed with weather-resistant high-impact plastic. It prevents debris overload on the aerator motor, and is adjustable in 15-minute increments to meet local codes for aerator operating usage. The 115-volt, 7-amp unit is easy to install and use, with a three-position toggle switch (On/Auto, Off, Continuous), warning light and reset button. 800/536-5564; www.septicserv.com/store.



Exterior Alarm

Exterior alarms with auxiliary contacts from Septronics feature removable terminal boards for straightforward wiring. Units feature a power indicator, and manual/reset/horn silence in one toggle switch. The latching relay allows the light to remain on until the reset is activated. Wall mounting brackets are included and pedestal mounts are available. It can be ordered as a high-liquid or low-liquid level indicator. 262/567-9030; www.septronicsinc.com.



Tank Alarm

The Tank Alert EZ indoor/outdoor alarm system from SJE-Rhombus is designed for easier installation of lift pump chambers, sump pump basins, holding tanks, sewage and other waste applications. The cover provides greater access for wiring in the field, while internal circuitry remains protected. The two-color molded enclosure integrates the red translucent LED beacon; the upper half illuminates and the horn sounds when an alarm condition occurs. When the condition clears, the alarm automatically resets. The interlocking enclosure features a sound chamber to amplify the horn while helping prevent moisture from entering. 888/342-5753; www.sjerrhombus.com.



Residential alternator and alarm

The Smart-Pak Plus residential alternator from Zoeller Pump Company allows a user to automatically switch from a failed to a working pump. It has built-in alarms; a single power cord and built-in rechargeable battery; a universal connection for the alarm switch; contacts for connecting an auxiliary alarm, dialer, or for integrating into a home security system; additional alarms and indicators for potential problems, including continuous running pump, high water, power outage, tripped breaker, and pump failure; a button for silencing the alarm and resetting the unit; and plug-and-play installation. 800/928-7867; www.zoellerpumps.com. □



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SSPMA officers pictured (from left) are Scott Stayton, secretary-treasurer; John Evans and Charles Cook, directors; Jeff Hawks, vice president; Jill Boudreau, director, and Mark Huntebrinker, president.

SSPMA elects officers, directors

The Sump and Sewage Pump Manufacturers Association (SSPMA) elected Mark Huntebrinker (Zoeller Co.) president, Jeff Hawks (Champion Pump) vice president and Scott Stayton (Franklin Electric/Little Giant) secretary-treasurer. Directors elected were Charlie Cook (Liberty Pumps), Linda Kerdolff (Wayne Water Systems), Jill Boudreau (Goulds Water Technologies) and John Evans (Motor Protection Electronics). Susan O'Grady (Pentair Water) remains on the board as past-president. SSPMA represents the manufacturers of sump, sewage and effluent pumps, along with component and accessory suppliers. SSPMA also hired Blake R. Jeffrey, CAE of Blake R. Jeffrey Inc., Indianapolis, to serve as managing director. He replaces Pamela Franzen, who retired after 39 years.



Congressman tours Advanced Drainage Systems

U.S. Rep. Robert E. Latta (R-Bowling Green) toured the Advanced Drainage Systems manufacturing plant in Findlay, Ohio. ADS designs and manufactures pipe and other products used in municipal storm and sanitary sewers.

SJE-Rhombus named Silver ESOP award winner

SJE-Rhombus was named a Silver ESOP award winner by The ESOP Association. The award recognizes companies for their work in sustaining an employee stock ownership plan for 25 years. SJE-Rhombus was one of 26 corporate members to be honored by the association in 2013.



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Infiltrator Systems receives recycling award

Infiltrator Systems received the Chairman's Award from the Society of Plastics Engineers for its plastic recycling program. The award recognizes companies that demonstrate environmental leadership.



Xylem offers Goulds Water Technology training

Xylem will offer three-day Goulds Water Technology Factory School training for distributors, dealers, engineers and OEMs with at least one year of industry experience at the company's Seneca Falls, N.Y., location. Topics include Residential Water System Product Application and Troubleshooting, Sept. 23-26; Variable Speed Drive Products and Applications, Oct. 7-10; Industrial Pump Products and Applications, Oct. 28-31; Wastewater Pumping Products and Applications, Nov. 4-7, and Residential Water System Product Applications and Troubleshooting, Nov. 18-21. More information is available at <http://xylemappliedwater.com/factory-school>.

Ditch Witch presents sales, service awards

Ditch Witch presented Detlef Kaiser of German-based Tramann+Sohn with the 2012 Lowell Highfill Award, the organization's highest recognition for sales performance, and awarded Brent Zerr of Ditch Witch of Oklahoma with the Gold Ace Award for highest worldwide sales volume. Ditch Witch also awarded Josh Kennedy of Ditch Witch of Oklahoma with the Harold Chestnut Award, its highest recognition for service, and awarded Jeff Lone of Ditch Witch Midwest with its 2012 Service Manager of the Year award. □



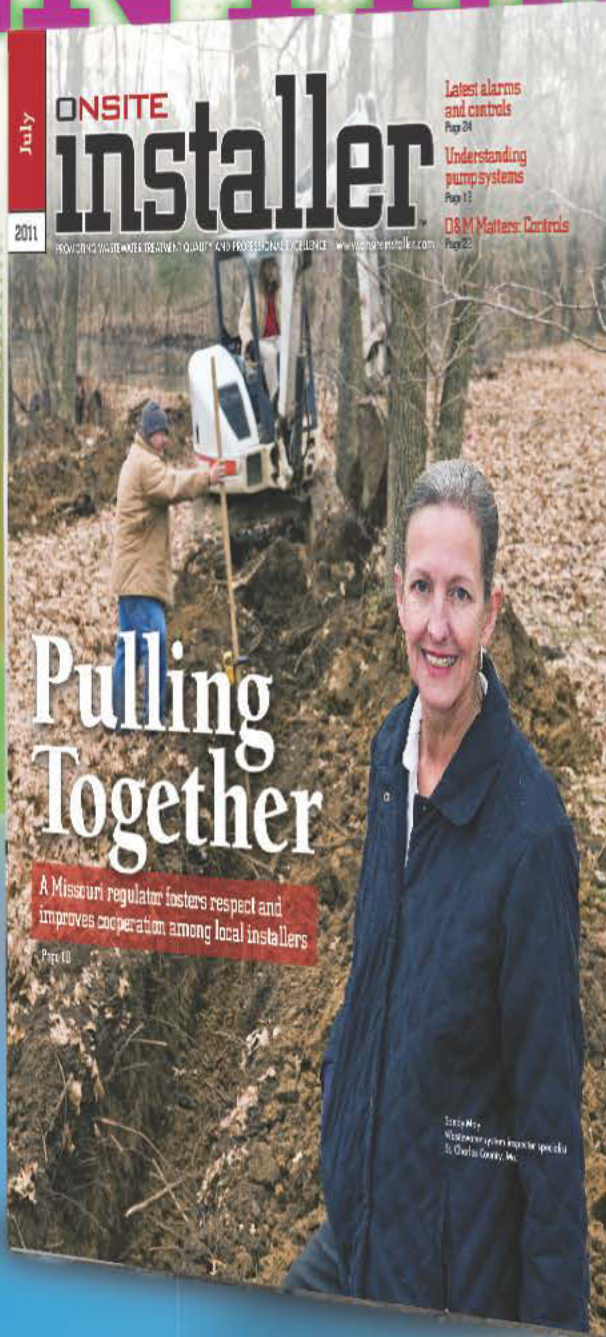
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Water Cannon jetter, hot pressure washers

Jetters and hot pressure washers from Water Cannon are available with flow rates of 8 gpm and pressure up to 7,000 psi, based on model and accessories. Trailer models have 200-gallon onboard water tanks and require no external power. Available with Honda or Kohler engines, the units come with direct drive or V-belt and a choice of Annovi Reverberi, Cat or General pumps. Standard trailer packages include 250-foot hose reels, trigger gun, wand and nozzle. 321/800-5744; www.watercannon.com.



Vermeer rubber-tracked pedestrian trencher

The RTX250 rubber-tracked, steerable pedestrian trencher from Vermeer has a 27 hp Kohler electronic fuel-injected gasoline engine and can dig 8-inch-wide trenches up to 48 inches deep. Features include a two-handlebar VZ steering system and dedicated platform. The trencher is 35.5 inches wide for maneuvering in tight locations. 888/837-6337; www.vermeer.com.



Goulds submersible high temp sump pump

The high temperature submersible sump pump from Goulds Water Technology - a Xylem Brand, is designed to handle applications where liquids are too hot for conventional submersible pumps, including wastewater from boiler blow down and hot water rises in commercial plumbing. Able to handle liquids up to 200 degrees F, the cast iron pump has a semi-open impeller, corrosion-resistant, stainless steel shaft, locknut to guard against component damage on accidental reverse rotation and the ability to run dry. It can handle 3/4-inch solids and pump up to 70 gpm with up to 27 feet TDH. 866/325-4210; www.gouldswatertechnology.com.



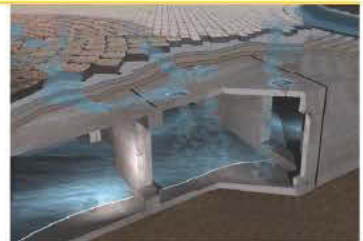
Gehl RT250 compact track loader

The RT250 compact track loader from Gehl has an operating capacity of 2,500 pounds, 74.3 hp Tier 4 engine and delivers 243 ft-lbs of torque. It has a lift height of 128 inches and tipping load of 7,143 pounds. The Automatic Track Tensioning System eliminates the need for manual tensioning, increasing the life of tracks and bearings. The operator-adjustable straight-tracking feature keeps the unit on a straight path at all times. Joystick controls are mounted directly to the suspension seat frame, allowing them to move with the operator. 800/628-0491; www.gehl.com.



Oldcastle stormwater management system

The PermaCapture low impact development stormwater management system from Oldcastle Precast and Oldcastle Architectural is an all-inclusive run-off control system that manages water volume in addition to protecting water quality by providing integrated pretreatment. The system combines structural precast concrete vaults with permeable interlocking concrete pavers for stormwater retention, detention, reuse, groundwater recharge and flood management. 888/965-3227; www.oldcastleprecast.com/wastewater.



Norweco Hydro-Kinetic wastewater treatment system

The Hydro-Kinetic residential wastewater treatment system from Norweco is NSF Standard 40 and 245 certified, achieving 2.0 mg/L CBOD, 2.0 mg/L TSS and 7.9 mg/L total nitrogen. Flow-equalized liquid from the clarifier enters the filter, where it flows downward and is evenly distributed beneath filtration media. The liquid flows through the attached growth filtration media where final treatment takes place. The non-mechanical flow equalization process ensures incoming wastewater is fully treated, regardless of heavy use periods. The system includes a model A100 air pump and 1/3 hp model SD103 recirculation pump with 2-inch discharge. 800/667-9326; www.norweco.com. □



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WISCONSIN

Glass cullet approved for onsite applications

The Wisconsin Department of Natural Resources recently approved glass cullet generated from recycling for use as onsite system backfill, drainage aggregate, concrete additives, and aggregate base for road construction. Project manager Don Biely of Universal Recycling Technologies, a recycling company in Janesville, Wis., led the effort to have the material approved. It is not sharp, as the recycling process rounds the edges. Municipalities use glass cullet for bedding pipes, but it hasn't crossed over to the onsite industry.

"The product warrants our consideration," says Aaron Ausen, vice president of Dalmaray Concrete Products and president of Wisconsin Onsite Water Recycling Association. "It is readily available in bulk or super sacks, and competitive with or cheaper than gravel and sand." Glass cullet for onsite applications is equivalent in size to 3/4 washed stone, but it is stronger and harder than limestone and will not break down over time. For product information, email Biely at dbiely@universalrecyclers.com.

The Wisconsin Onsite Water Recycling Association donated an onsite system from design to installation to a family with an expired drainfield. The owner turned to WOWRA for help after learning he can't sell the property to pay medical bills without replacing the system.

The association also awarded \$5,000 in scholarships to four college students. Kelsey Wieser is majoring in English education at UW-Eau Claire. Mitchell Jentges plans to major in natural resources and forestry at UW-Stevens Point. Brian Falk is studying instrumental music education at St. Norbert College. Sam Ritger plans to study to become an electrician at Moraine Park Technical College.

MICHIGAN

Septic advances

The Michigan Septic Tank Association legislative committee is working with State Rep. Ken Goike (R-Ray Township) to advance a bill that would allow haulers access to secondary roads, eliminate the 2025 requirement to abandon storage facilities, and allow haulers to use receiving stations of their choice.

NATION

NOWRA Nuggets

"Design and Technology: Moving Forward Nationally" is the theme of the 22nd annual National Onsite Wastewater Recycling Association Technical Educational Conference Nov. 18-20 at the Millennium Maxwell House Hotel in Nashville, Tenn. Presentations will focus on design standards with national applicability, technology transfer and reciprocity across jurisdiction lines, high-strength wastewater, innovations in treatment technologies, and design, installation, and responsible management of large commercial cluster systems. Download the conference schedule and registration form at www.nowra.org/annualconference.

ONTARIO, CANADA

Biosolids video

The Water Environment Association of Ontario produced the video "Biosolids: Naturally Sustainable," to increase public knowledge of the beneficial

use of biosolids. The video highlights regulations, best management practices and research initiatives, and demonstrates sustainability in biosolids management. The 38-minute video is available through the organization at www.weao.org.

TRAINING AND EDUCATION

Alabama

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

- Aug. 8-9 – Continuing Education, Guntersville
- Aug. 21-23 – Basic Installer
- Sept. 12-13 – Continuing Education, Rogersville
- Sept. 19-20 – Pumper

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 <http://aowatc.uwa.edu>.

Iowa

The Iowa Onsite Waste Water Association has an Operation and Maintenance course on Sept. 17 in Ainsworth. Contact Alice Vinsand at 515/225-1051, execdir@iowwa.com, or visit www.iowwa.com.

Minnesota

The University of Minnesota Onsite Sewage Treatment Program has these classes:

- Aug. 7 – Soils Continuing Education, Two Harbors
- Aug. 14 – Soils Continuing Education, Winona
- Aug. 20-23 – Service Provider, St. Cloud
- Sept. 5 – Sampling Onsite Systems, Waterville
- Sept. 12 – Soils Continuing Education, Bemidji

Call Nick Haig at 800/322-8642 (612/625-9797) or visit <http://septic.umn.edu>.

Onsite class for Realtors/appraisers

The University of Minnesota developed a four-hour class to help real estate agents and appraisers understand the basics of onsite systems and prepare them to answer questions from homebuyers and sellers. The state Department of Commerce approved the course, which includes regulatory overview, disclosure and compliance inspections, and updates on local requirements. For more information or to schedule the class, email Sara Heger at sheger@umn.edu.

Missouri

The Missouri Smallflows Organization has these classes:

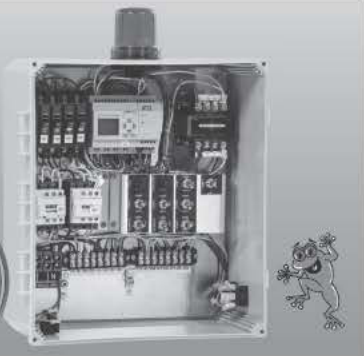
- Sept. 18-19 – Operations & Maintenance, Cape Girardeau
- Sept. 24 – Selling Systems, Springfield
- Sept. 25 – Pumps, Panels, and Electrical, Springfield

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New England

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

- Sept. 5 – Conventional Onsite Wastewater Treatment Basics for Installers
- Sept. 12 – Functional Inspections
- Sept. 19 – Innovative and Alternative Technologies
- Sept. 26 – Conventional Onsite Wastewater System Inspection
- Sept. 27 – Conventional Onsite Wastewater System Inspection Field Training

Call 401/874-5950 or visit www.uri.edu/ce/wq. For soil courses, call Mark Stolt at 401/874-2915 or email mstolt@uri.edu.

North Carolina

The North Carolina Septic Tank Association has an Installer/Inspector class Sept. 9 in Swansboro. Call the association at 336/416-3564 or visit www.ncsta.net.

North Carolina State University has a Subsurface Wastewater Operation and Maintenance course Sept. 10-12 in Mills River. Contact Joni Tanner at 919/513-1678; soils_training@ncsu.edu, or visit www.go.ncsu.edu/subsurfaceschool.

The North Carolina Pumper Group and Portable Toilet Group have an educational seminar on septage management and land application Sept. 21 in Asheville. Call Joe McClees at 252/249-1097 or visit www.ncpumpergroup.org or www.ncportabletoiletgroup.org

Pennsylvania

The Pennsylvania Septage Management Association has a Basic and Advanced Onlot Wastewater Treatment System Inspections course Sept. 17-18 in Montoursville. Call 717/763-7762 or visit www.psama.net.

Utah

Utah State University has onsite wastewater treatment certification and renewal workshops in Logan on:

- Sept. 9 – Level 1 Renewal
- Sept. 10 – Level 2 Renewal
- Sept. 11-12 – Level 1 Certification
- Sept. 24-25 – Level 2 Certification

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

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(IM)

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ABOUT THE AUTHOR

James Meyer is vice president of engineering and Scott Hetrick is sales manager for Norweco. The National Onsite Wastewater Association is dedicated to representing and educating all segments of the onsite/decentralized industry. For more information or to join, visit www.nowra.org, or call 800/966-2942.

Keeping a Watchful Eye

Advanced remote monitoring technologies help optimize system performance and bring more profits for installer professionals

By James Meyer and Scott Hetrick

Wouldn't it be great if the onsite systems you maintain could inform you when a problem exists? Better yet, what if they could alert you to problems *before* they occur? With advances in technology, that vision is a reality. Remote monitoring technologies for residential onsite wastewater applications are becoming more advanced, reliable and affordable. They will add to your product offerings, bring you more business and increase your profitability.

Remote monitoring offers many benefits for service providers as well as homeowners. However, with the number of technologies available, choosing the best system for your application can be confusing. Careful consideration

The key to a good remote monitoring system is ease of use. If a system is complicated and cumbersome, the value of the technology will be lost.

should be given to the most valuable benefits. In addition, be sure to familiarize yourself with local regulations. As more technologies emerge, regulators are taking notice and some areas are adopting requirements for remote monitoring.

The core purpose and biggest advantage of remote monitoring is the ability to offer continuous real-time monitoring of a wastewater treatment system, and to automatically notify the service provider of abnormal operating conditions. Constant monitoring alerts service providers to operational issues before the homeowner realizes a problem exists.

DETECT PROBLEMS EARLY

Some remote monitoring systems diagnose operational issues and attempt to correct them without outside intervention. For example, if the system detects a pump or motor is drawing an abnormal amount of current, it may turn off the equipment and attempt to restart under normal operating conditions several times before alerting a possible operational issue. Perhaps something has temporarily clogged the pump intake. By attempting to restart the pump, the clogged item may be dislodged and normal operation resumes.

Remote monitoring systems allow service providers to address specific site conditions before they arrive to investigate an operational issue. A good

remote monitoring system gives the service provider details about a problem so they can bring the correct tools and equipment when responding to an alarm. Wouldn't it be great to know you need a pump before driving 50 miles to an installation?

The ability to maintain an accurate record of operation and maintenance should be considered when choosing a remote monitoring system. Many allow access to historical data for treatment systems through Web-based technologies. This can assist in service scheduling in addition to troubleshooting operational issues. Wouldn't it be helpful to know the high-water alarm on a system had been activated multiple times in the past year?

Coupled with advances in smartphone technology, a service provider can have this information at his fingertips at the installation site.

The key to a good remote monitoring system is ease of use. If a system is complicated and cumbersome, the value of the

technology will be lost. Nobody wants to spend hours learning how to use a new system. Remote monitoring systems provide value when they are intuitive for users. Historical information should be presented in a format that can easily be used to spot trends before problems occur.

ANSWER THE CALL

Homeowners make a considerable investment in the installation and long-term operation of their treatment system. Viewing service information for their system assures it is being properly maintained.

With thousands of systems to track, a well-designed remote monitoring system can save considerable time and provide credible evidence that treatment systems are working correctly and are properly maintained. As regulators become familiar with benefits of the technology, more areas will adopt requirements for remote monitoring.

Properly designed, specified and implemented, a remote monitoring system can change the way that you do business for the better. Remote monitoring can save you time during service visits, give you credibility with homeowners and regulators, and add to your bottom line. The onsite industry is evolving and regulations are becoming more stringent. Are you ready to answer the call? ■



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