

March

2009

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Abandoning Old Systems
Page 8



Only One Way

Parsley Septic Tanks prides itself on "doing it right" consistently

Page 16

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COVER STORY

Only One Way

By Gil Longwell

ON THE COVER: The right system for the site is the watchword for Parsley Septic Tanks in Lanexa, Va. Here, co-owner Mike Parsley (left) and team member Linwood Harris set a pump at a residential installation. (Photography by Joe Mahoney)

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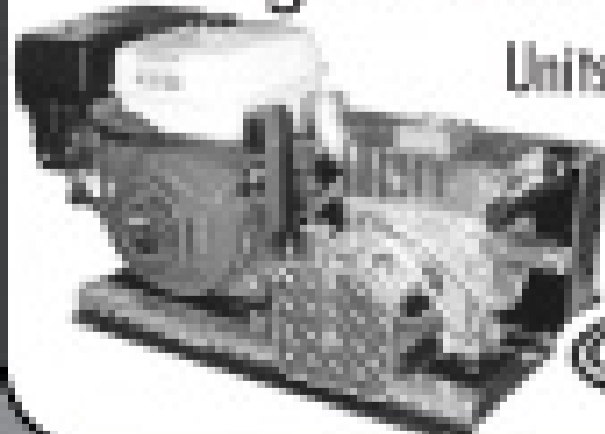
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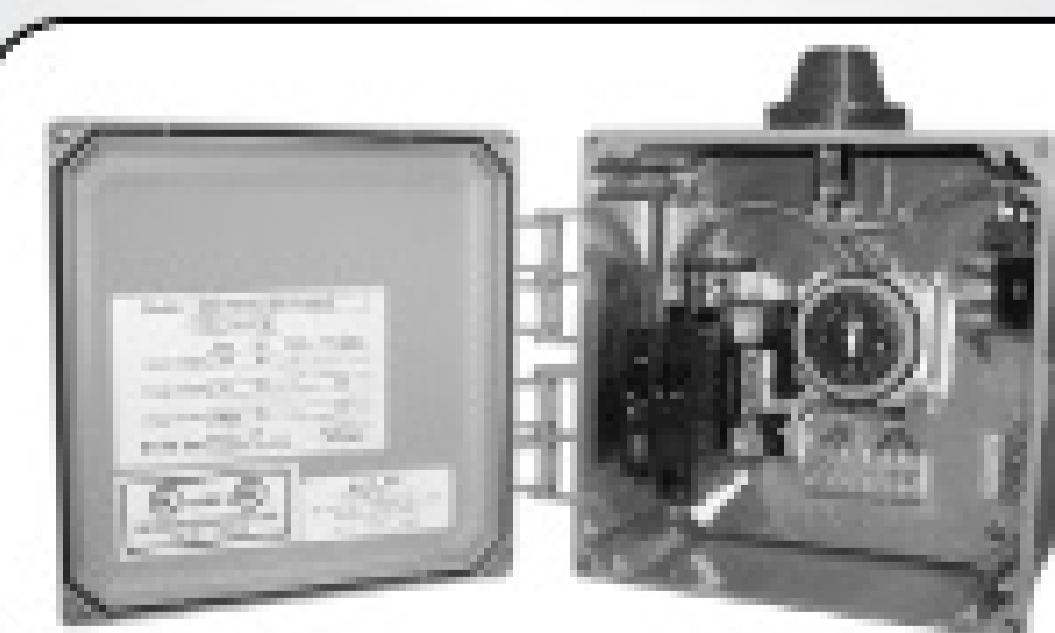
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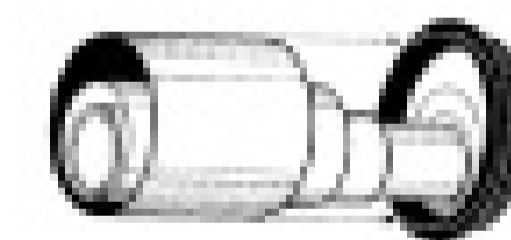
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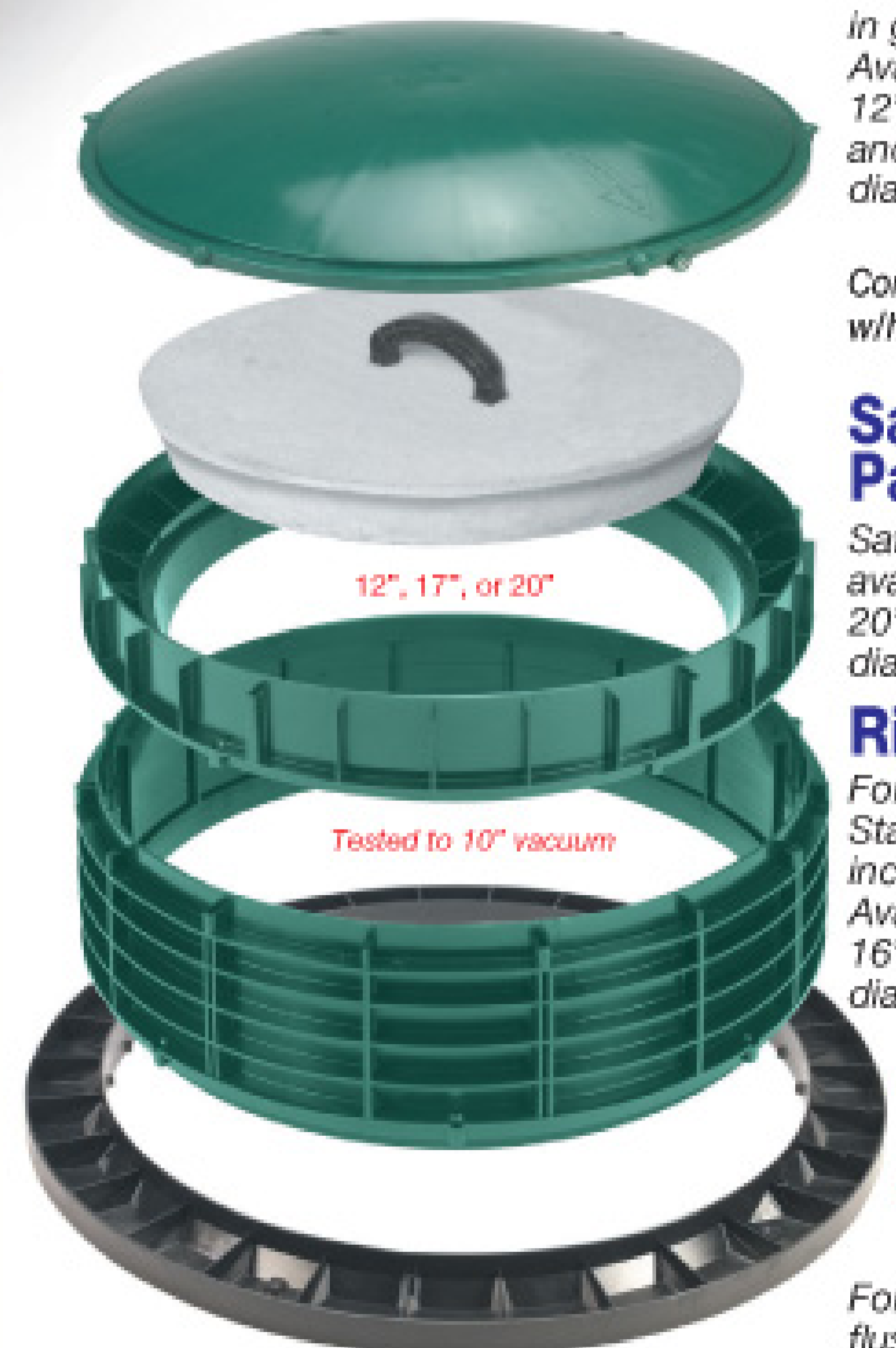


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Green Solutions

NOWRA's 18th Annual Technical Education Conference and Expo highlights "The Sustainable Wastewater Opportunity"

By Ted J. Rulseh

Milwaukee is a great place in early April, especially since they built Miller Park, with its retractable roof, as the home of the Brewers.

Before then, opening days were often an exercise in masochism. Forty-degree afternoons are common at that time of year, and while that may be great for football at Green Bay's Lambeau Field, it's wicked for baseball. I know, because I went to a few very chilly openers.

This year there's another reason to be in Milwaukee in early April, and it's the NOWRA 18th Annual Technical Education Conference and Expo. It runs Monday through Thursday, April 6-9. If you stay over an extra day, and if you don't mind buying tickets from a scalper, you can catch the Brewers' home opener against the Cubs.

The big picture

If you're an onsite design, installation or service professional, the conference is reason enough to travel to Milwaukee. This year's theme is "ONSITE: The Sustainable Wastewater Opportunity."

There are two national NOWRA events each year — the technical conference in spring and the Installer Academy in December. The academy has more hands-on, practical training for installation specialists, but if you're of that persuasion, you should not assume that the conference is just for the academics and regulators.

For one thing, the conference program includes a considerable

number of highly practical sessions, not the least of which is the annual program, "The Basics of Onsite Systems — A to Z." For another, the conference covers big-picture issues that eventually touch the entire industry and everyone in it.

In important respects, it's fair to say that if you've never been to the NOWRA conference, you don't have a clear picture of the industry you work in and where it fits in the grand scheme of environmental and wastewater management.

It's inspiring to see yourself and your business as part of something bigger. And seeing that bigger picture can help you perceive business opportunities you might never know about if you just stick to attending your state meetings and working in your own neighborhood.

On the agenda

NOWRA always has an excellent technical program, and you can find that on the Web site at www.nowra.org. (Look for the conference emblem in the lower right corner of the home page.) It's also worth looking at the field trips and other special offerings.

If you arrive on Monday, you can join a tour of four onsite treatment sites in the area. They include systems serving a high school with an enrollment of 1,000 students, a major Cabela's sporting goods store and deli, a 100-home subdivision, and a business center that includes restaurants.

The innovations at these sites demonstrate why NOWRA believes

onsite is a green solution to wastewater management. All these developments are the kind typically associated with municipal sewer service — yet onsite systems serve them well and keep the local environment safe.

If you want to see the other side of wastewater treatment, you can visit the Jones Island Water Recla-

Browsing the menu

Those aren't the only programs of interest. A quick look at the overall program and the technical session agenda reveals many topics worth exploring. They include:

- A general session presentation on "The Greening of Wastewater Treatment"

It's inspiring to see yourself and your business as part of something bigger. And seeing that bigger picture can help you perceive business opportunities you might never know about if you just stick to attending your state meetings and working in your own neighborhood.

mation Facility in Milwaukee during a three-hour tour on Tuesday afternoon. Jones Island, at 300 million gallons per day, handles wastewater from 28 communities in the Milwaukee area.

Stick around for Thursday and you can take in an all-day Midwest Regional Code Forum. If you've been frustrated by changing state and local regulations, and by rules that differ from county to county for no seemingly logical reason, this would be a good place to spend time.

This roundtable of federal, state and local officials will consider whether regional onsite rules would be feasible. Small-group discussions will explore how to overcome barriers and make regional technical requirements acceptable. The outcome is expected to be a roadmap marking the way to better and more consistent rulemaking.

- A program on "Implementing a Performance-Based Code," led by Bruce Lesikar of Texas A&M University
- A technical session providing an overview of soils and site evaluation

- A technical session on development of certification-specific training for onsite professionals.

And there are many more items, as auctioneers like to say, "too numerous to mention." So think about heading to Milwaukee for the NOWRA conference. You'll enjoy a hospitable city in a beautiful Lake Michigan lakefront location, with great restaurants, including some of the best German cuisine you can find.

And a chance to stick around and snag a ticket to the Brewers' home opener, played in comfort under the retractable roof at Miller Park. ■

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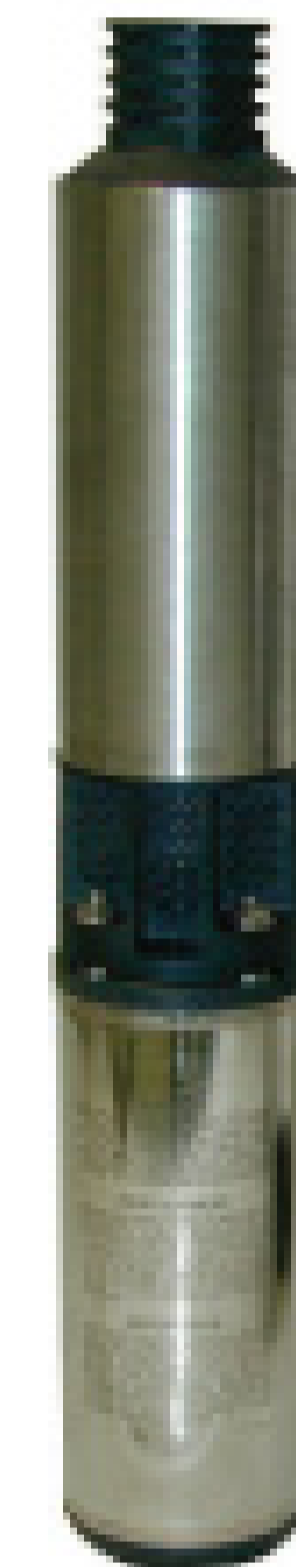
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Jim Anderson and David Gustafson are with the University of Minnesota's widely recognized onsite wastewater treatment education program. Jim is director of the university's Water Resources Center, and Dave is the university's extension onsite sewage treatment educator. Readers are welcome to submit questions or article suggestions to Jim and Dave. Write to ander045@umn.edu.

Out With the Old

A critical step when installing a replacement onsite system is abandonment of the existing onsite system in accord with all rules and regulations

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

It's not every day you have an onsite system that needs to be totally abandoned. Still, it's important to abandon the old system properly when installing a replacement system.

There are several major reasons for this. First, you need to follow your state and local regulations so you do not get blindsided by fines or requirements that force you to go back and redo part of the job. Other reasons are safety for the homeowner and others, and to protect yourself from future lawsuits.

Know and follow

As always, it is your responsibility to know the rules and regulations and follow them. We'll describe what is important in abandoning a system on our home turf in Minnesota. Your state or county may have different or additional requirements, so if you are not sure — check!

Tank abandonment procedures apply for sewage tanks, cesspools, leaching pits, drywells, seepage pits, vault privies, pit privies and distribution devices. All liquids and solids must be removed and disposed of properly. If that is not part of your regular business, you'll need to hire a local pumper. Pumping the material to the surface or into a ditch is not proper disposal.

You'll need to remove and recycle or dispose of any electrical devices. That includes alarm and water level floats and switches. A number of older floats actually con-

tained mercury, which is considered a hazardous waste and needs to be treated accordingly, both to avoid introducing that highly toxic material to the environment and to protect you and your employees from mercury poisoning.

Remove and fill

Abandoned tanks must be removed or, if left in place, crushed and the cavity filled with soil or rock. Any holes left from removal of tanks, privies or distribution devices also need to be filled. It is also important to remove the connection between the building and the tank, if it is not part of the new construction.

We know of a contractor who replaced a system for a commercial establishment but left a previous tank in place, left the connection back to the building, and sealed the outlet to the tank. Then a heavy rain filled the tank, and the water backed up into the establishment, flooding the lower floor. Removal of the connection also prevents future unlawful discharge to the system.

In the case of cesspools, seepage pits and drywells, filling of the cavity is extremely important. People who live in areas where such systems are common are well aware of the safety issues in leaving those open cavities. Hardly a year goes by without some homeowner walking in the backyard and falling into the cavity as it collapses. Often, these trips are fatal. From an installer perspective, you become a lot more cautious after



To abandon an old onsite system properly, the tank must be removed or filled with aggregate. (Photography by David Gustafson, P.E.)

Tank abandonment procedures apply for sewage tanks, cesspools, leaching pits, drywells, seepage pits, vault privies, pit privies and distribution devices. All liquids and solids must be removed and disposed of properly. If that is not part of your regular business, you'll need to hire a local pumper. Pumping the material to the surface or into a ditch is not proper disposal.

losing a piece of equipment to one of those old pits.

Dealing with drainfields

If the soil treatment and dispersal unit is to be removed, you must handle contaminated materials in a way that prevents human contact. These materials include distribution media, soil or sand within 3 feet of the system bottom, distribu-

tion pipes, tanks and soil around leaky tanks. It also includes any soil that received sewage from surface discharge. Septage or any mixed waste must be disposed of or treated according to state, federal or local requirements.

If contaminated material is to be spread or used on-site within one year, it needs to be placed or stockpiled in an area that is protect-

ed from erosion and runoff and that meets any local setback requirements from buildings, property lines, lakes, streams or ditches.

A cover of 6 inches of soil material should be placed over the contaminated material. After one year following contact with sewage, the material can be spread on-site and covered with 6 inches of uncontaminated soil or used to fill in aban-

doned-in-place tanks.

Other contaminated materials, such as pipe, geotextile fabric or rock, should be dried and disposed of in a mixed municipal solid waste landfill.

One last note: Whether your state requires it, or not, keep good records of when and how you abandoned the system. This means even taking photos of the process and the result. ■



During abandonment, all old piping must be disconnected. Other actions may be necessary, depending on specific local and state requirements.



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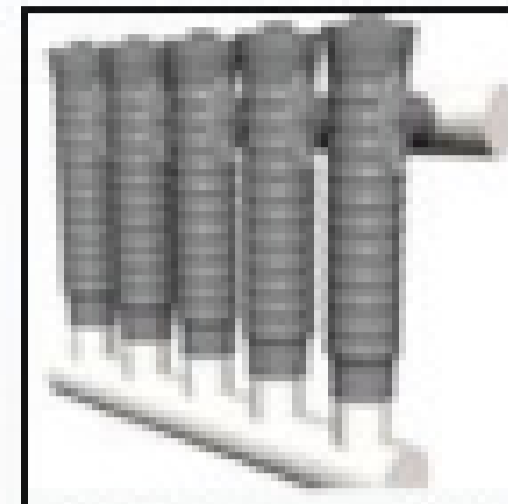


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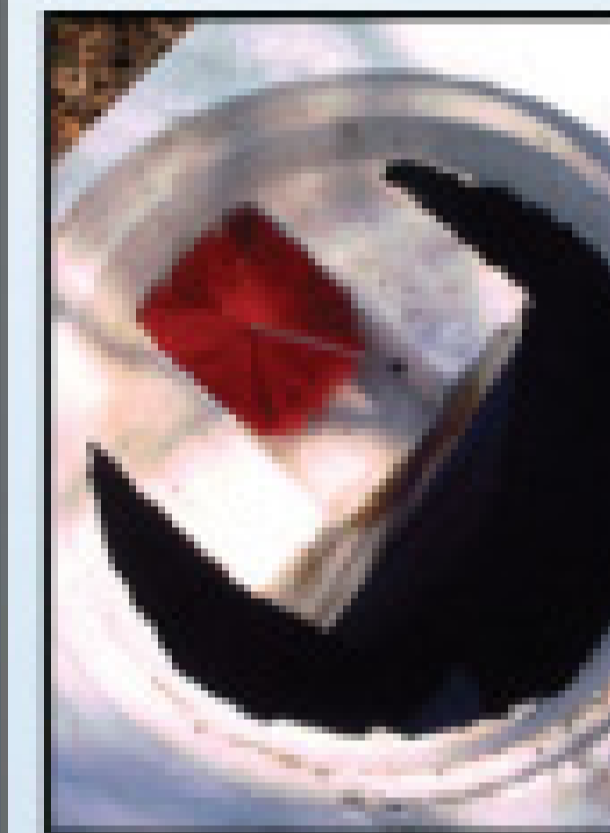
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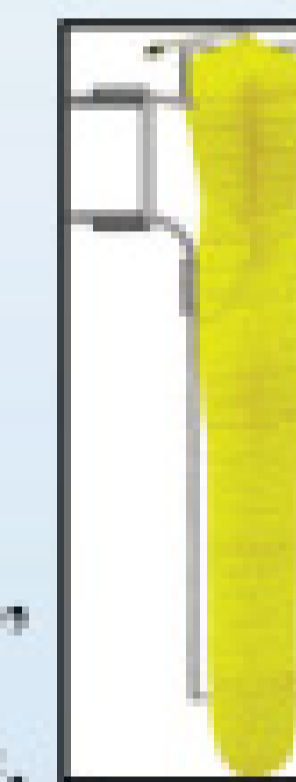


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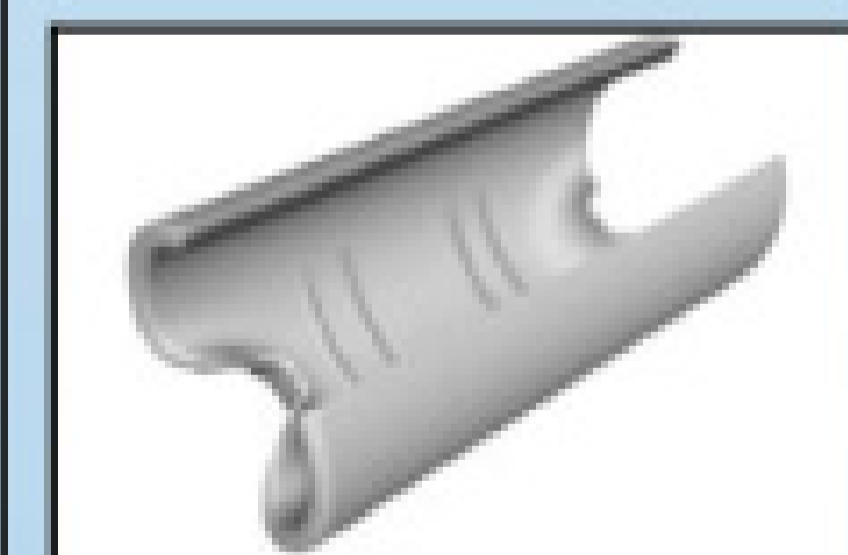
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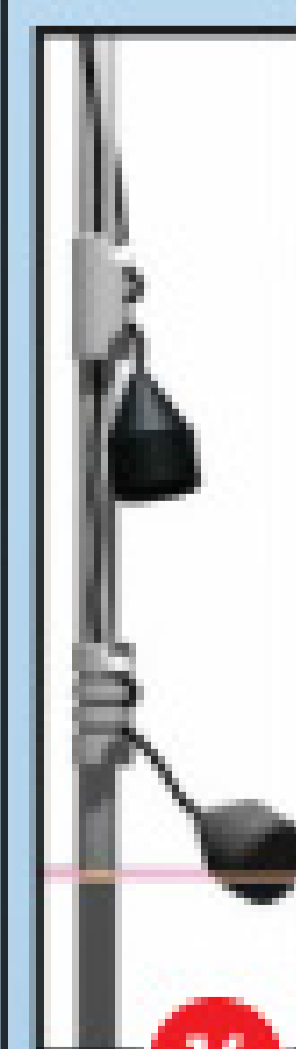
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Windows to Performance

Here is an alternative design for inspection ports in pressurized onsite treatment systems built with plastic chamber drainfields

By John Glassco

Plastic chambers are becoming a standard in onsite treatment leachfield design. However, installers are often on their own when it comes to construction details, especially with pressurized septic systems. Many chamber manufacturers simply do not have standard designs for ports and other details.

Photo A shows a standard completed drainfield with the vaults almost ready to backfill. The laterals have sweeps at both ends with threaded caps for squirt testing and lateral cleaning. Conventional ports use 4-inch risers with slip caps. The port bodies are slotted to fit over the laterals to bring the laterals to grade.

This conventional port has several drawbacks. First, the homeowner is faced with the six curious ports sticking up in the lawn when

the location of the drainfield is lost, and periodic testing and maintenance are impossible.

Also, this conventional port design gives no access to inspect the floor of the drainfield or the depth of effluent in the system because it is outside of the footprint of the drainfield vaults. The lateral end sweeps are built out past the drainfield end caps. Diagnosis of distribution issues, drainfield failure and other problems is almost impossible without visual access to the drainfield.

Another approach

An improved design is shown in Photo B. Here, the drainfield is shown being reviewed for backfilling by a health inspector. This design provides a single port at each end of each lateral with access

Accurate information from the septic system is critical to long-term function, and a good port design is the only window into this vital component.

the job is done. The slip caps are hard to remove, and that often results in the entire port being extracted from the ground instead of just the cap (inset photo).

This usually encourages the owner to remove all the ports and fill in the holes. The ports then cannot be replaced without extensive work. Once the ports are removed,

for drainfield inspection, squirt testing and lateral cleaning.

A capped sweep tee is used instead of a straight coupler at the port base to stabilize the port and to prevent the port twisting when the threaded cap is removed. This also prevents the port from being easily pulled out of the ground.

The inset photo shows the



PHOTO A: A conventional drainfield is shown almost ready to cover. The inset photo shows the finished lawn with the slip caps sticking up. One has been extracted from the system by the owner. (Photos courtesy of John Glassco)

underside of the port inside the vault with the lateral end sweep turning up into the port body. The end orifices in each lateral point down into an orifice shield to drain each lateral at the end of the dose. This is very important in colder climates where the laterals could freeze and burst.

The orifice shield prevents spray from undermining the vaults. A ceramic plate or a carefully placed rock can be used for this purpose instead. The construction sequence begins with the placement of the first vault. The 1-inch lateral is strapped to the underside

of the vault with nylon zip-ties.

Orifices are predrilled in the shop using a drill press, alternating 30 degrees right and left to avoid masking by the undersides of the vaults. The port body, ASTM 3034 PVC, is located in the port cutout and extended up to within 6 inches from the planned finish grade. As each vault is clipped to the row, the lateral is strapped underneath.

The tee to the manifold in the middle of the system is positioned under a hole-saw cut-out between the vault ribs. Then the opposing lateral is glued into the central tee and the drainfield is continued.



PHOTO B: A center manifold drainfield with improved ports is being inspected. Unlike the standard design, these ports can be used for squirt testing as well as for inspecting the interior of the drainfield. The inset shows the base of the port inside the last vault with the lateral sweep held in place by a quick-tie.

When the last vault in the row is clipped in place, the hole for the far-end port must be drilled in the top of the vault as close to the end of the system as possible between the ribs. The lateral is trimmed so the sweep will come up into the port without putting pressure on the lateral.

A bit of practice makes the far end port go in easily. The short riser in the port should rest tight against the far inside wall of the port body. The threaded cap over the male adapter on each end of the lateral must be close to the top of the port under a threaded end cap for access.

Doing the test

Some health departments want to inspect the entire lateral network during the final squirt test. However, many inspectors allow the

final squirt test to be accomplished through the end ports, especially if the ports are designed to accommodate this test.

Photo C shows such a squirt test in progress after final back-filling with the threaded lateral end cap removed and replaced with a cap drilled to match the orifices. The tape is hooked onto the inside bottom of the port (the same elevation as the top of the lateral) to measure the squirt height.

The inset photo shows the finished appearance of the drainfield port using a 7-inch round irrigation valve box, which provides plenty of space for the 4-inch port and its threaded cap.

Reputations rise and fall on the execution of details. With mostly invisible but highly functional ports, the customer can inspect the system and troubleshoot problems



PHOTO C: This system is being squirt tested and shows a 64-inch squirt. The tape is hooked on the bottom of the port at the lateral elevation. The inset photo shows the finished appearance using 7-inch PVC round valve vaults.

easily. Over the long term, a reputation for building systems that are user-friendly and easily inspected will come back to the installer in referrals from homeowners and respect from regulators. Accurate

information from the septic system is critical to long-term function, and a good port design is the only window into this vital component. ■

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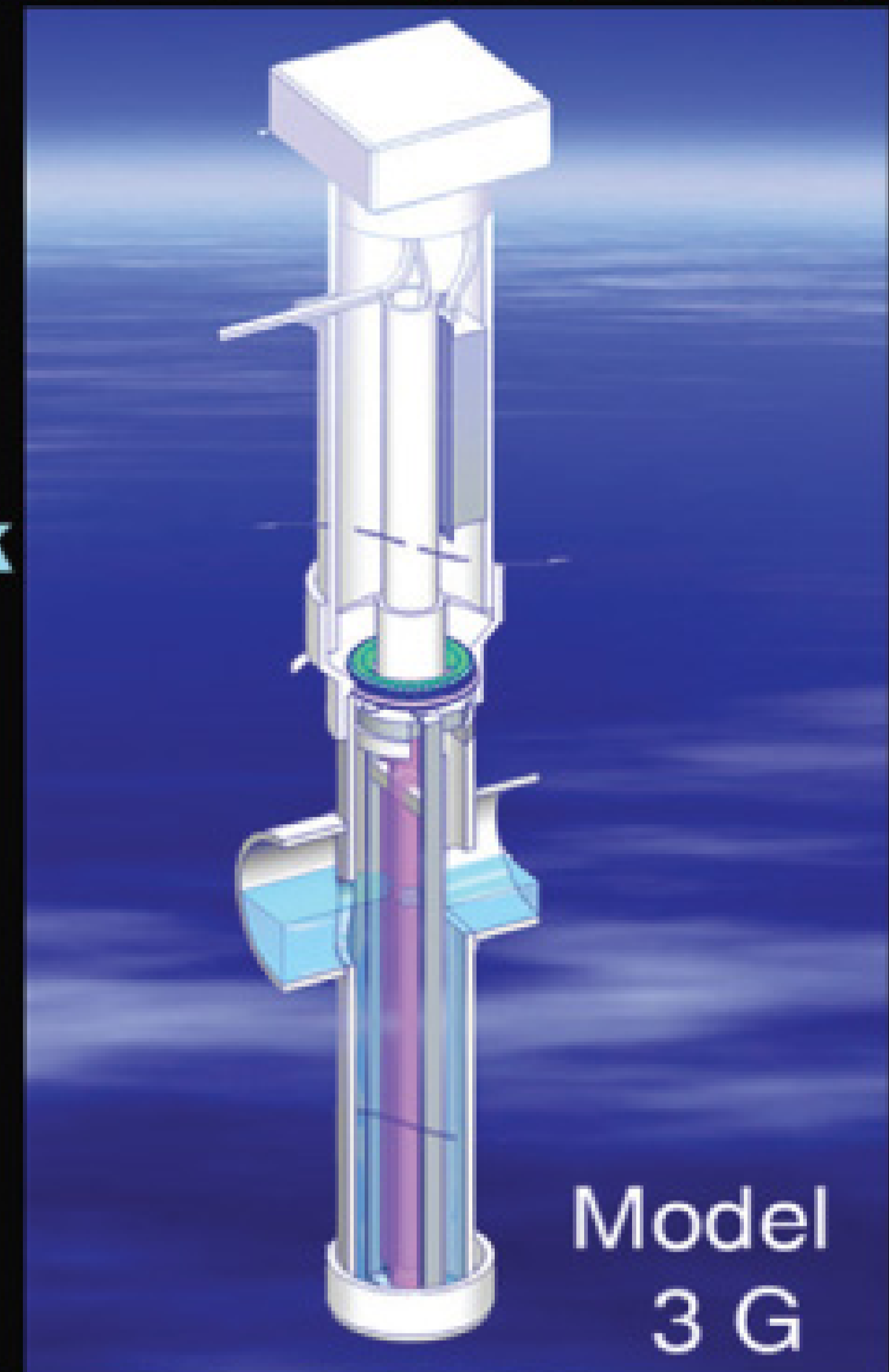
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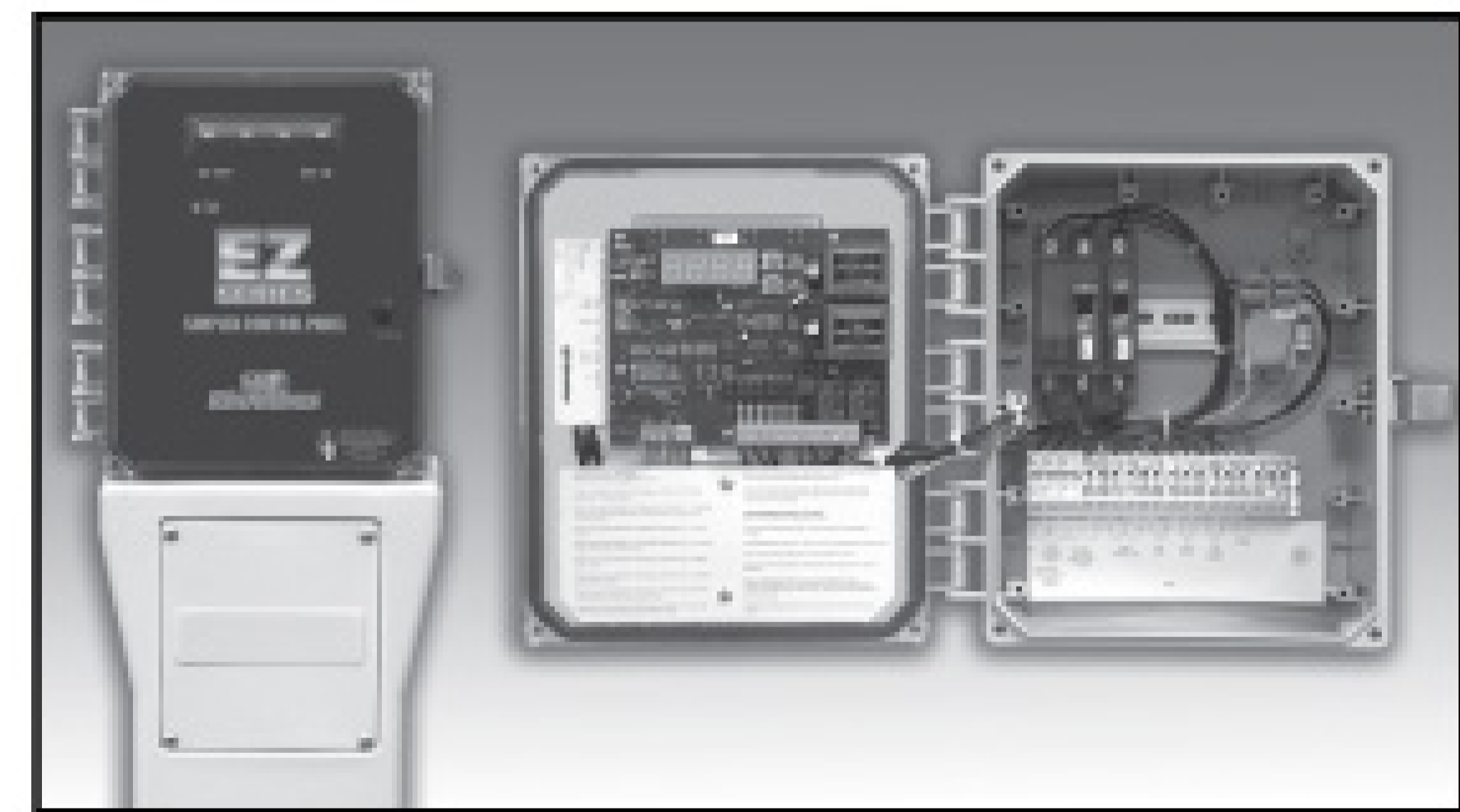
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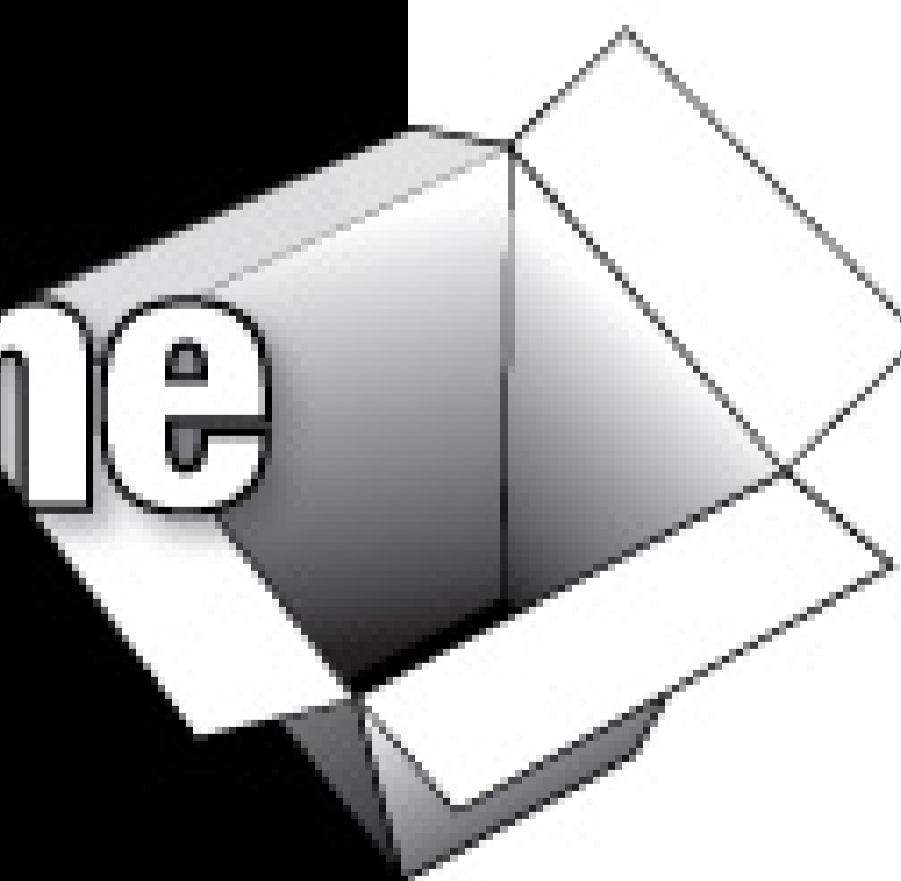
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Machine Matters is designed to help readers get the most from excavators, backhoes, skid-steers and other mechanical equipment through proper maintenance, operation and financial practices. Readers are welcome to submit ideas for this column and can send them to Ted J. Rulseh, editor, by calling 800/257-7222 or e-mailing editor@onsiteinstaller.com.

Axle Care Basics

Your work machines run on their axles. Are you giving them proper attention? Here are some basic maintenance pointers.

By Greg Northcutt

It's easy to take the axles of your backhoe loader for granted. When, for example, was the last time you crawled under your machine to inspect the axles? When is the last time you even thought about them?

Just because axles are the strongest part of your machine, that doesn't mean you can ignore them without paying a price in costly downtime and repair bills. Axles operate in a harsh environment of damaging dirt, sand, mud and water. They are a sophisticated system of ring, pinion and planetary gears, differential locks and wet disk brakes. These components can be subject to high rates of wear if not maintained properly.

Diego Navarro, service marketing manager for John Deere Construction and Forestry, explains the whys and hows of giving your axles the attention they deserve.

A look inside

The axles of a backhoe loader or other construction machine perform several functions. In addition to carrying the weight of the machine and connecting power from the engine and transmission to the wheels, the axle has to absorb the shock loads generated from traveling over bumps and ruts and from using the bucket or other attachment. "When you drive the loader forward and the bucket hits a pile of dirt, the shock of hitting

that obstacle passes through the axle," Navarro notes.

The differential consists of a set of gears that transfer the rotational power of the driveshaft 90 degrees to the right and left axle shafts. These gears make it possible for the rear wheels to rotate at different speeds when turning the machine. The differential allows the wheel on the inside of a turn to rotate more slowly than the outside wheel, which must travel farther in the same time to complete the turn. Meanwhile, the differential provides torque to wheel with the least resistance.

Most backhoes are equipped with a differential that physically locks together the left and right axle shafts to prevent wheel slippage for more traction. Some, however, use a limited-slip differential, which permits one of the wheels to slip to a certain extent.

Because the two axles are not completely locked together, part of the torque also goes to the nonslipping wheel. The limited-slip differential offers the advantage of allowing the machine to change directions while transmitting power to both wheels. Also, unlike a locking differential, it works automatically, eliminating the need to engage or disengage it when operating the machine.

Four-wheel-drive backhoes typically have a locking differential in the rear axle and a limited-slip differential in the front axle.



A complex component of backhoe loaders and other types of construction equipment, the axle does much more than help shoulder the weight of the machine. Here, a John Deere 410J TC loader backhoe goes about its business. (Photo courtesy of John Deere)

Brake differences

Although some manufacturers use external dry disk brakes mounted at the end of the axles to stop wheel rotation, most equip their machines with internal wet disk brakes.

Unlike external brakes, which are exposed to dirt and water that can shorten brake life and reduce braking effectiveness, wet disk brakes are mounted inside the axle housing and immersed in oil, which dissipates heat. They may be placed close to the differential to accommodate machine geometry or farther away near the ends of the

axle for better cooling.

Planetary gears, located after the differential in the drive train, reduce the speed of the axle to provide more torque for working. Depending on make and model, they may or may not share the same oil as the differential.

Backhoe jobs involving a lot of braking could lead to overheating of the gear oil or tractor fluids. Working in mud or other conditions that leave a thick coat of dried material around the axle can cause overheating.

"I've seen axles where you needed a screwdriver to break the

crust around the axle," Navarro says. "I've seen axle bearings fail because the oil got too hot, reducing the viscosity and lubricating ability of the oil."

Maintenance tips

Now that you know a little more about how axles are built, here are some basic tips for maintaining them.

Use the correct lubricants. Depending on the manufacturer, either tractor fluids or gear oils are recommended for lubricating the gears and internal brakes. They also reduce brake chattering. "In general, gear oils are heavier than tractor fluids, which are also used in hydraulic transmissions," Navarro says. "Either way, they need to be good quality because they are working in extreme load applications."

He recommends using the proper viscosity for the seasons, such as 75W-90-, 80W90- or 85W140-weight oils or tractor fluids with a 32 or 68 ISO viscosity. If using gear oil in axles with wet disk brakes,

the oil should include a friction modifier, he adds. A friction modifier usually isn't necessary when using tractor fluids because they already include it in the formulation.

Check the oil or fluid levels. Most differentials have a plug that can be removed with a socket wrench for checking lubricant lev-

number. It can also reveal the presence of dirt, water and metal particles, which can indicate wear or failure of components. Navarro advises doing an analysis every 500 hours.

Change lubricants when needed. The gear oil or tractor fluid should be changed based on its condition, rather than hours of use.

"I've seen axles where you needed a screwdriver to break the crust around the axle. I've seen axle bearings fail because the oil got too hot, reducing the viscosity and lubricating ability of the oil."

Diego Navarro
John Deere Construction and Forestry

els. "If the oil or fluid is cold, you should be able to stick your finger in the hole and feel it," Navarro says. "If the lubricant is warm, the level should be up to the hole. If it isn't, you may have a leak."

Analyze the oil. An oil analysis is the best way to check lubricating oil or fluid for viscosity and acid

"If you change it based on hours, then you don't account for any work done in high-stress environments, like working in water, which can shorten the effective life of the lubricant," Navarro says.

Check the breather. Backhoes often have a breather located at or near the top of the axle. It allows

the heated oil to expand, pushing air out along with any moisture in that air to reduce water contamination. Clear any debris from around the breather.

Tractor fluid or gear oil around the breather opening could indicate failure of the seal around the hydraulically operated piston that actuates a wet disk brake.

Keep wheel bolts tight. While not strictly an axle component, the wheels of your machine are directly connected to it. The wheel studs use friction to keep the wheels clamped to the axle flange. "When the wheel studs are loose, you lose that friction and all the load is transferred to them and not the axle," Navarro says. "That's when the studs start to break. The studs are designed to keep things together, not to support the weight of the machine."

Greg Northcutt is a freelance writer based in Port Orchard, Wash. He can be reached by e-mailing this publication at editor@onsiteinstaller.com. ■



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Parsley Septic Tanks employee Linwood Harris loads drainfield pipe for a job. (Photography by Joe Mahoney)

Only One Way

Parsley Septic Tanks prides itself on always installing the right system for the site. In fact, "doing it right" have been the company watchwords for years.

By Gil Longwell

Parsley Septic Tanks Inc., Lanexa, Va.

OWNERS: Mike and Everett Parsley

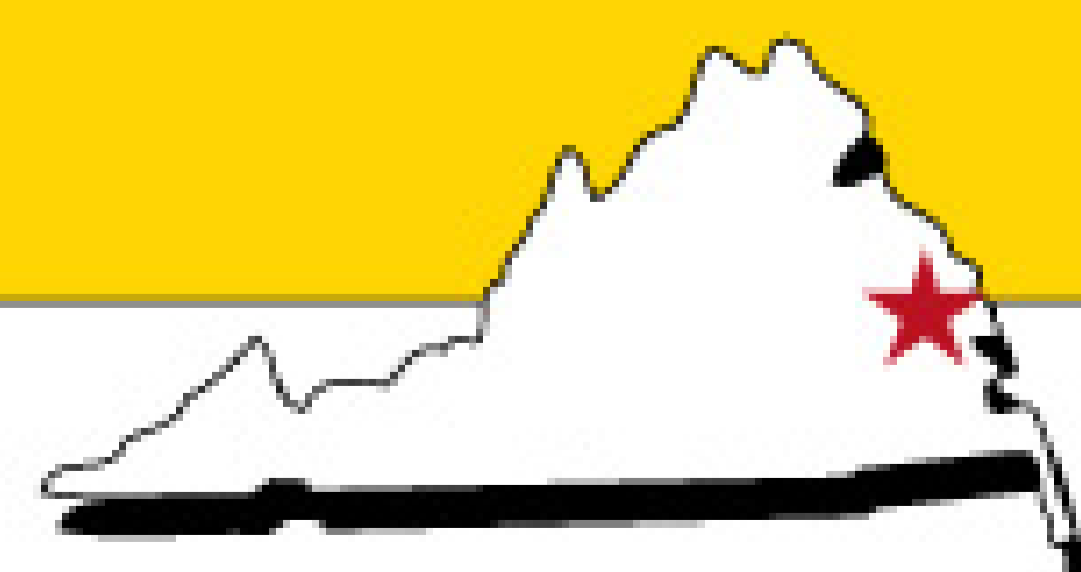
YEARS IN BUSINESS: 45

EMPLOYEES: 3

MARKET AREA: 50-mile radius

BUSINESS MIX: 70% new systems, 25% pumping, 5% management

AFFILIATIONS: VOWRA, NOWRA



Parsley Septic Tanks installs the right system for every site's unique conditions and has been doing so for two generations. The watchwords of "doing it right" began with Jimmie Parsley, the founder, and remain the hallmark today.

Owners and brothers Mike and Everett Parsley learned the importance of "doing it right" as young men working with and for their dad. As their knowledge grew and the regulations changed, so has their understanding of what a "right system" looks like. They have found success by following change and always doing things the one way their father taught them.

A key driver of the business is tightening regulation related to efforts to protect the Chesapeake Bay. Many of the Parsleys' systems include advanced treatment units

— the company holds certifications from four manufacturers.

The business also benefits from mandatory pumpouts of septic tanks and from regulations that require owners of advanced treatment systems to secure maintenance contracts with licensed service providers.

Rural location

"We will always have a strong, focused position in the onsite installation business," Mike Parsley says. Growing up in the business, in Lanexa, in southeast Virginia, the brothers learned the importance of staying focused.

"Originally, dad did plumbing and heating work and installed septic systems, but it wasn't long before septic system work took over," Mike says.

Lanexa is not in the wilderness, but it is somewhat isolated, and that made it a challenge to get septic

"Newcomers want to know about and understand their systems, and we spend the time it takes to help them do that."

Mike Parsley

tanks when needed. There were tank quality issues, too. To change that situation, Jimmie Parsley made his own forms and started casting tanks. Since the mid-1970s, the firm has used commercial molds, and the brothers continue to manufacture tanks. "This is fill-in work that usually gets done when conditions are too wet to work in the soil," says Mike.

Tank manufacturing brought competitive advantages. "We always have the right tank on hand, and there is never an enormously



From left, Linwood Harris and co-owners Everett Parsley and Mike Parsley open a form to reveal one of the concrete septic tanks the company produces.



Mike Parsley says today's customers want to know and understand their onsite systems.

expensive unsold inventory in the yard," Mike says. Making tanks helps save hauling costs, too. Each year the company makes about 100 tanks — enough for its own needs and to sell a unit to another contractor on occasion.

Lanexa lies on a peninsula about halfway between Williamsburg and Richmond. "From the top of the roller coaster at Busch Gardens, you can see the rivers on either side," says Mike. The York to the north and the James to the south flow to Chesapeake Bay.

Federal and state government programs to protect and improve the bay's water quality are driving changes in the onsite industry to which the Parsleys must adjust. The other agent of change is the economy.

The brothers serve all or parts of five counties in their 50-mile service radius. Last year, the counties notified owners of homes served by septic systems about a new maintenance mandate. Beginning in 2009, every treatment tank must be pumped or inspected every five years. Through 2006, the company pumped about 100 tanks per year. "On average, we now pump 100 tanks per month," Mike says. "We are swamped with new pumping business."

New residents' attitudes about tank pumpouts are often in sharp contrast to the strong opinions of long-term residents about proper tank maintenance. "Newcomers want to know about and understand their systems, and we spend the time it takes to help them do that," Mike says. "On the other hand, many long-term homeowners choose tank inspection rather than a pumpout. These folks are carrying out a family tradition that sees no purpose for a pumpout and sees no reason to abandon that tradition."

Lifestyle impacts

In Virginia, Commonwealth-registered site evaluators and professional engineers prepare and often collaborate on system designs. "We do work with designers when asked, but that is not too common," Mike says.

A few designers work with homebuyers or developers to up-size systems to handle the lifestyles that go with the up-sized houses built in recent years. Still, says Mike, "We have seen builders try to place big houses on small lots and service them with systems that meet minimum system requirements."

When on the design team, the brothers tell owners how their

lifestyles will affect the systems. "We get a lot of calls for systems that have been overloaded," Mike says. "When owners understand that adjusting their lifestyle can help the system, they change their ways."

In 2009, every system in Virginia that has an advanced treatment component, such as an aerobic treatment tank, must be managed by a Commonwealth-registered management service provider. "We see the management portion of our business growing," says Mike. "In 10 years, it could be 50 percent of our annual workload."

The peninsula's soils influence



Mike (left) and Everett Parsley place a high value on building a strong reputation for their company for quality onsite installations.

Change and Opportunity

Every state in the Chesapeake Bay watershed is taking steps to reduce all impacts on water quality in the bay's tributaries. On the Virginia peninsula that is home to Parsley Septic Tanks, county pumping mandates are bringing the owners into contact with many customers.

"We spend a lot of time helping to educate new and long-term septic tank owners," says co-owner Mike Parsley. The folks new to septic systems are the easiest to educate. "Connecting tank maintenance to groundwater quality to the Chesapeake Bay helps most people

understand why this is being required," Parsley says. It is then easy to draw a parallel connection between the criteria that require advanced treatment and the need for mandatory system maintenance.

Other states are approaching their bay cleanup obligations differently, but the goals are the same. Nearly everywhere in the watershed, onsite systems must meet higher effluent quality requirements. The "Save the Bay" initiative is causing changes, and Parsley Septic is positioned to prosper.

Mike Parsley, Everett Parsley and Linwood Harris load up plastic drainfield chambers in preparation for an installation.

the systems installed. The soils are primarily sandy-clay-loam, and many sites have seasonal high water tables. "To protect the groundwater and the water quality in the bay, we must keep the system at least 18 inches above that seasonal water table," Mike says. Installing 60 to 75 systems per year in recent years, the brothers let their sole employee, Linwood Harris, work on a variety of systems.

Last year, about 95 percent of their installations were gravity systems. Because of local elevation changes, it is common to find the suitable absorption area upslope from the house. In about half these systems, a lift pump delivers the tank effluent to the gravity absorption system. The firm installed about 75 percent of the gravity systems using gravelless technologies, and most of those used chambers from Infiltrator Systems Inc.



That means the new management regulations will give the brothers another opportunity to work closely with customers. They know that every customer contact builds the bond of loyalty through education.

Flexibility brings success

With three people to do the full range of tasks, cross training and

By educating homeowners, the Parsleys are change agents. Whether their landowner contact begins as installer, service provider or pumper, their approach is the same. Investing time with customers, answering their questions, and helping them understand their systems builds relationships that bring loyalty and add value.

The Parsley name has value in the local marketplace and community. It is an asset the brothers value. "We have been in the community a long time," says Mike. "We expect to be here for a long time to come because we take the time to do it right." ■

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"We have been in the community a long time. We expect to be here for a long time to come because we take the time to do it right."

Mike Parsley

Although mound systems are permissible in Virginia, the Parsleys have seen only a few in their area, and they have not yet installed one. About 5 percent of their installations are drip systems, and those require an advanced treatment unit as part of the design. Parsley is approved to install AdvanTex AX20 units from Orenco Systems Inc., Model 500 units from Clearstream Wastewater Systems Inc., Ecoflo peat biofilters from PremierTech Environmental, and Puraflo peat filters from Bord na Mona Environmental Products Division.

The brothers expect the percentage of drip systems will increase. "In recent years, most of the new residents who moved here came from places with public sewers," Mike says. "These new owners have no clue what an onsite system is or how to use it."

flexibility are essential. "Everett and I are pretty much interchangeable as far as work assignments go," says Mike. "At times, you could say he's my supervisor when he's handling elevation control and I'm on the backhoe." Harris helps manufacture and install tanks and is the primary vacuum truck operator. In the office, Mike handles billing, payroll and all related tasks. "I took that work over from Mom a few years ago," he says.

The equipment fleet is as flexible as the men who operate it. The roster includes two Case 580 backhoes, a 1985 Ford F700 dump truck, and a 2005 Interstate 20DT trailer. Tank pumping is handled by a pumper outfitted by Lely Mfg. with a 3,500-gallon tank and an NVE 360 pump from National Vacuum Equipment. A 1994 Chevy pickup is put into service as needed.



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Pumping Performance

The latest innovations in pumps and blowers give onsite installers more options when designing treatment systems

By **Scottie Dayton**

Growth in advanced onsite wastewater treatment systems by definition means growth in sump, sewage and aeration pumps. Here are several new offerings from manufacturers of those products.

High-head Turbine Pump

The **5030-0007 turbine pump** from **Zoeller Pump Co.** filters effluent pumping in high-head applications. Its 115 V (or optional 230 V) motor runs cool while driving a stainless steel shaft. Seven stages of impellers enable the pump to achieve 241 feet of total dynamic head. Flow from the 1 1/4-inch glass-filled Noryl discharge is 11 gpm at best efficiency where it overcomes more than 120 feet of head. The pump is used in mound, drip or media filter systems, and STEP collection for decentralized and pressure sewer applications. **800/928-7867; www.zoeller.com.**



EasyPak from Orenco Systems Inc.

Pump-tank Package

Installers no longer have to piece components together or make field cuts with the **EasyPak pump package** from **Orenco Systems Inc.** The box contains everything needed to pump effluent from dosing tanks. The 4-inch turbine effluent pump in a low-profile filtered vault pumps nearly to the bottom of the tank and lasts millions of cycles. Packages for timed or demand dosing also include the float and discharge assemblies, splice box and control panel. **800/348-9843; www.orenco.com.**

Larger Horsepower

The **FL-series of effluent pumps** from **Liberty Pumps** now includes single and 3-

5030-0007 from Zoeller Pump Co.



phase 1-, 1.5- and 2-hp models with flows to 130 gpm and maximum heads to 130 feet. They have 1 1/2- and 2-inch discharges for connecting to either size pipe. **800/543-2550; www.libertypumps.com.**

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Different ejectors enable the system to perform oxygenation, aerobic sludge digestion, ozone treatment, mixing, foam suppression and homogenization (mixing). Units are self-aspirating to depths of 21 feet, but will work with blowers, if needed. Installation requires no major modifications to existing structures. **203/380-4800; www.flygtus.com.**



Jet Aerator from ITT Water and Wastewater Corp.



Pump stations from Premier Tech Environment

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High-efficiency Effluent Pump

CPSTEP512 1/2-hp effluent pumps from **Champion Pump Co. Inc.** pass 3/4-inch solids, achieve 93 feet of total dynamic head, and have single or double seals. The high-efficiency permanent split capacitor motor has upper and lower ball bearings. Power



CPSTEP512 from Champion Pump

cords up to 50 feet long have an outer jacket seal, allowing plugs to be cut off when connecting to junction boxes or control panels without voiding the warranty. A sealed entry prevents water from entering the motor housing. 800/659-4491; www.championpump.com.

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Stainless steel submersible **Unilift KP pump models** from **Grundfos Pumps Corp.** have a vertical discharge port and integrated single-phase canned motor in insulation Class F with thermal overload protection. Even partly submerged, these light, compact units transfer clean or slightly dirty wastewater with 3/8-inch solids and fit into narrow drainage pits. The pump, fitted with suction strainer and carrying handle, has a float switch for automatic start and stops, and a 16-foot cord. Single-curved vanes with beveled front edges prevent the semi-open impeller from clogging. The motor has a liquid-filled rotor chamber and water-lubricated bearings. The main cable secures to the socket of the hermetically sealed housing. 913/227-3400; www.grundfos.us. ■

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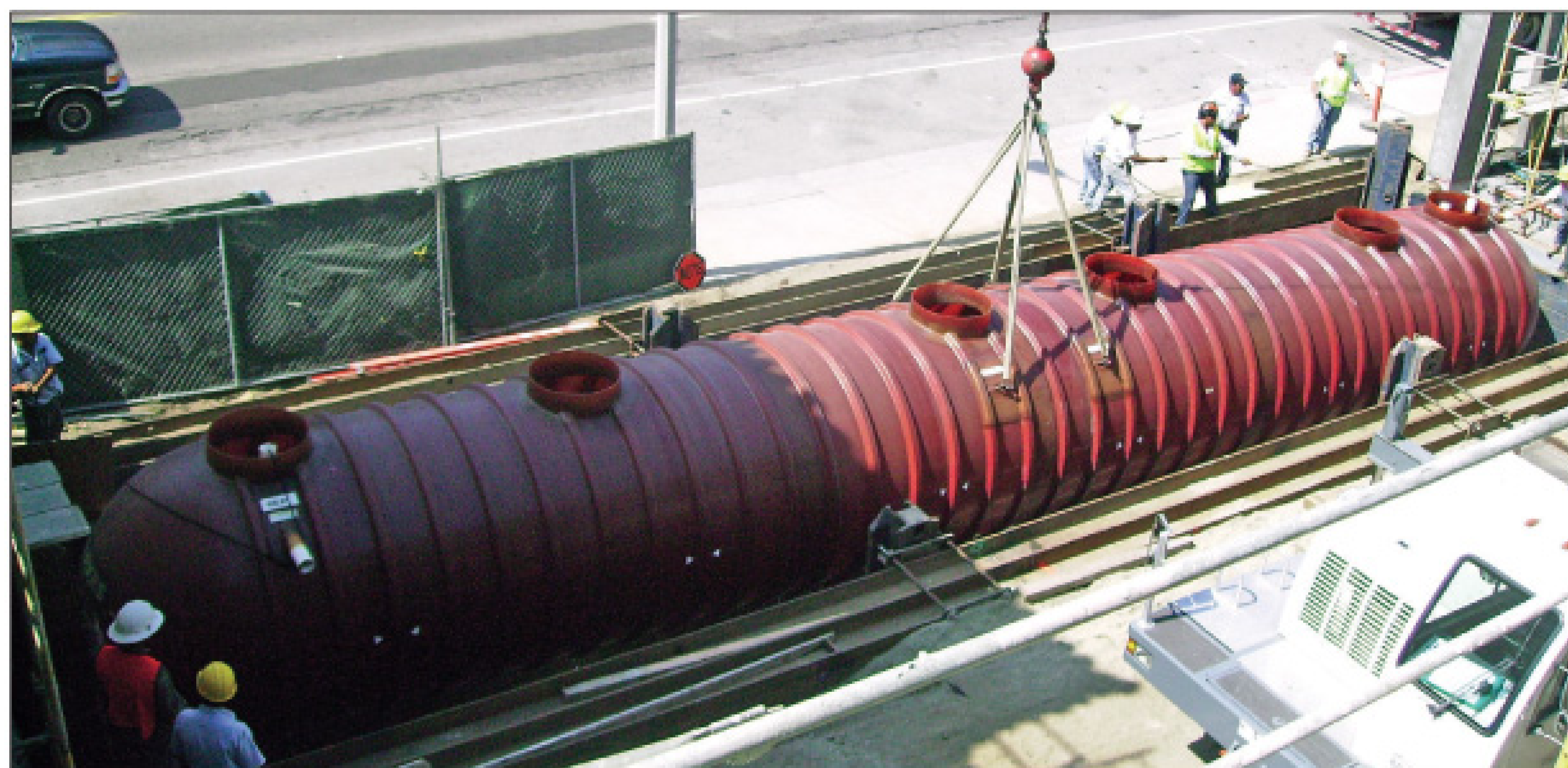
A FAST system and sequencing batch reactor with chlorination enables the renovation of an exclusive oceanfront hotel in southern California

By **Scottie Dayton**

In 2007, the Malibu Beach Inn underwent a multimillion dollar renovation that included a new onsite system to comply with regulations.

Situated on Billionaire's Beach in downtown Malibu, Calif., the 47-room hotel abuts the Pacific Coast Highway, one of the busiest thoroughfares in the nation. The designer of the onsite system, John Yaroslaski, P.E., of Ensitu Engineering Inc. in Morro Bay, faced challenges with environmental issues, high groundwater, odor control and the need for a traffic-rated drainfield.

Installer Russell Mosser of Mosser Plumbing & Heating Inc. in Marina Del Rey spent nine months battling rocks and boulders, contam-



An overhead view shows the 70-ton crane, fiberglass tank, and traffic on the Pacific Coast Highway as a crew worked on installation of the onsite system at the Malibu Beach Inn. (Photos courtesy of Mosser Plumbing & Heating Inc.)

System Profile

Location:	Malibu, Calif.
Facility served:	Malibu Beach Inn
Designer:	John N. Yaroslaski, P.E., Ensitu Engineering Inc., Morro Bay, Calif.
Installer:	Mosser Plumbing & Heating Inc., Marina Del Rey, Calif.
Site conditions:	Silty sand with rocks and boulders; water table 8 to 11 feet below grade.
Type of system:	FAST aerobic treatment units, Bio-Microbics Inc., Shawnee, Kan.; sequencing batch reactor, Ensitu Engineering Inc., Morro Bay, Calif.; sand filtration gravel pack traffic-rated drainfield.
Hydraulic capacity:	12,000 gpd

inated soils, tight spaces, potential cave-ins, traffic, and workers on scaffolding.

Just starting the system with its two fixed-activated sludge treatment (FAST) units, sequencing batch reactor, chlorination, and sand filtration gravel pack drainfields took a month. The Inn reopened in October 2007. The onsite system functions perfectly.

Site conditions

Soils are silty sand with rocks and boulders. The water table is 8 to 11 feet below grade. The property is between the Pacific Ocean and a canyon cliff across the Pacific Coast Highway.

System components

Yaroslaski designed the system to treat 12,000 gpd. Its major components are:

- 5,000-gallon one-compartment grease tank. Most tanks are concrete and made by Jensen Precast from Fontana, Calif.
- 5,000-gallon one-compartment septic tank.
- Existing 5,000-gallon dosing tank retrofitted with two 3.0 FAST aerobic treatment units from Bio-Microbics Inc., Shawnee, Kan.
- 6,000-gallon flow equalization tank with 30-inch diameter screened pump vault and two P-50 1/2-hp high-head effluent

pumps from Orenco Systems Inc., Sutherlin, Ore.

- Four-compartment fiberglass tank (sequencing batch reactor custom designed by Ensitu), Xerxes Corp., Minneapolis, Minn.
- Chlorination and dechlorination units.
- Flow meter.
- VENTSORB odor control unit from Calgon Carbon Corp., Pittsburgh, Pa.
- 24 solenoid valve boxes.
- 1 1/4-inch purple PVC piping (for reclaimed water) with 1/8-inch emitters every 2 feet and orifice shields.
- Custom-built Web-based monitoring system and control panel from IPC, Laguna Hills, Calif.

System operation

Wastewater and restaurant grease gravity flow through separate 4-inch PVC Schedule 40 lines into the septic tank, the FAST tank where most solids are removed, and the flow equalization tank. Pumps then send the water into the sequencing batch reactor with 1,300-gallon anoxic cell, 6,900-gallon treatment chamber, 7,500-gallon settling-recirculation compartment, and 18,000-gallon dosing compartment.

Yaroslaski added the Ensitu-designed reactor in case anything should slip through the FAST units. "Because it is a hotel and directly on the ocean, we're polishing the influent a little better," he says.

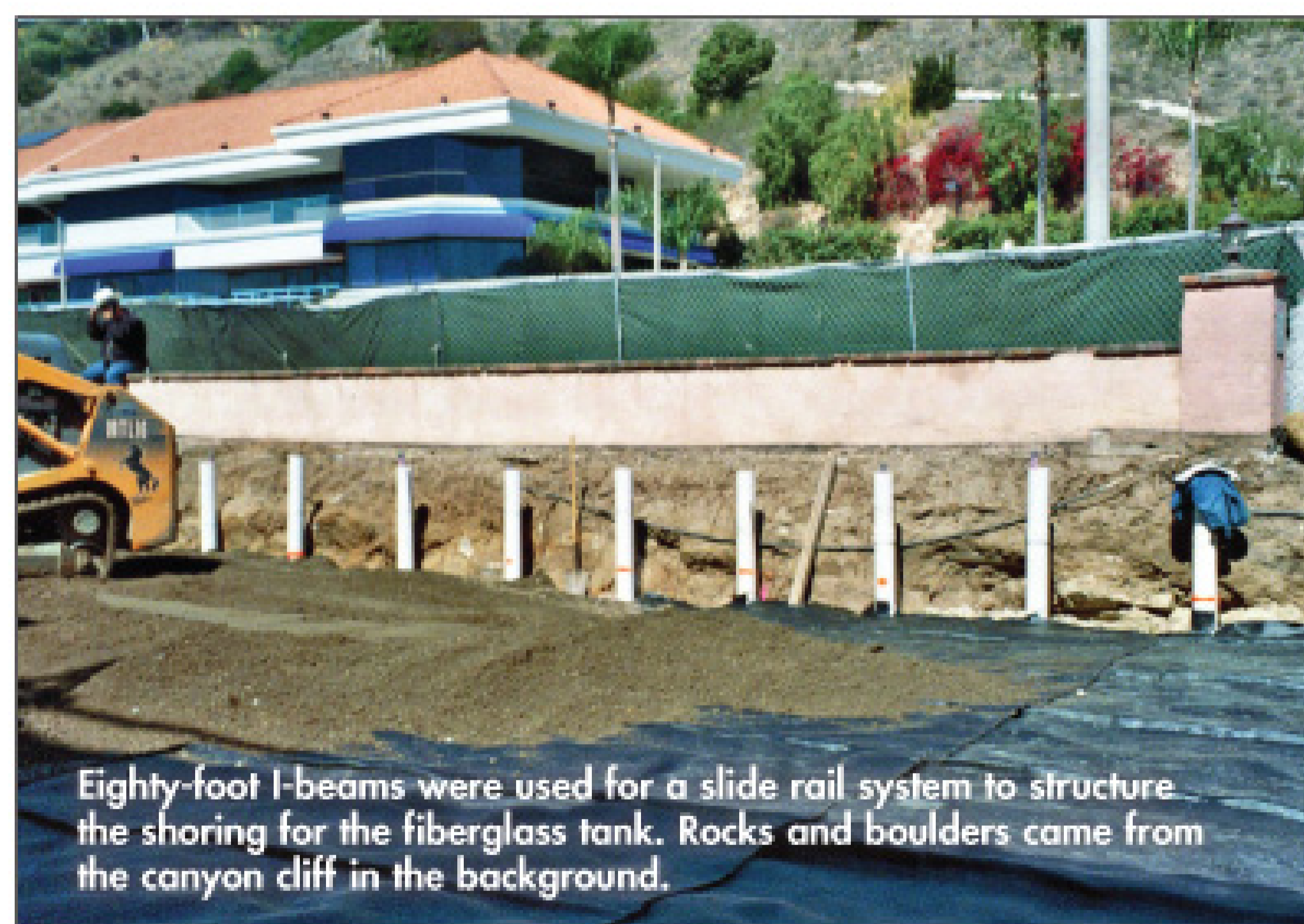
In the anoxic cell, influent combines with liquid from the settling-recirculation compartment. To ensure a homogeneous mixture, 22 Wilfley Weber aeration diffusers (from Ashbrook Simon-Hartley) on a raised platform aerate the liquid at 4.5 psi.

In the second chamber, an air-lift pipe takes the water up and over the baffle and into the third compartment, where two alternating P-50 1/2-hp Orenco handling pumps recirculate liquid back to the anoxic cell. Twelve diffusers operating at 2.5 psi supply enough air to satisfy the microorganisms.

The dosing compartment has P-50 1/2-hp duplex pumps in an Orenco pump vault. They send



A Mosser Plumbing employee attaches a 1 1/4-inch PVC lateral to the 2-inch distribution header. The crew drilled 1/8-inch emitters with orifice shields every 2 feet.



Eighty-foot I-beams were used for a slide rail system to structure the shoring for the fiberglass tank. Rocks and boulders came from the canyon cliff in the background.

"We had 8 inches of clearance on either side of the tank and utilities all over. We faced the possibility of the highway and the two structures collapsing as we excavated."

Russell Mosser

effluent to the chlorination disinfection unit, then to the dechlorination unit for neutralization. Most of the system is demand dosed.

Solenoids discharge the water to 12 zones in the east or west drainfields buried 3 feet beneath the parking lot. The 60-foot-wide, 2,516-square-foot east field has 15 39-foot-long laterals on 4-foot centers. The 47-foot-wide, 3,324-square-foot west field has 12 62-foot-long laterals on 4-foot centers. The parking lot was paved with air-permeable asphalt.

Local regulations require monitoring of the system around the

clock. A flow meter after the dechlorination unit measures how much water is discharged, and telemetry panels enable the plant operator to comply and adjust the system as needed.

Installation

The conventional gravity-flow system shut down when the hotel closed for the two-month remodeling project. Mosser, expecting to be the first contractor on the property, was the last. When his crew arrived to dig up the parking lot and remove the old system, workers were applying stucco to the completed inn.

Mosser's men uncovered the old dosing tank and left it. Then things became difficult. Instead of finding sand as stated in a geologist's report, they hit rocks and boulders. "We removed 39 truck-and-transfer loads, and that took six weeks," says Mosser. "In the process, we uncovered two more septic systems."

The first had runs of 4-inch clay pipe with 1/4-inch spaces between each 12-inch length. Untreated effluent had leached through the openings, contaminating the soil. The second system was 12 intact 15-foot-deep brick cesspools in a row. "We originally were going down only 7 feet, but ended up digging down 15 feet to remove the tainted soil," says Mosser. "We hit groundwater at 8 to 11 feet."

Dams kept the water at bay, but it was impossible to shore the parking lot because of its size. Instead, the men back cut on a slope up to the hotel. To prevent the scaffolding around it from collapsing, the contractor pulled off the legs and attached the framework to the building. A geologist constantly monitored ground movement, as a cave-in would jeopardize the hotel.

The next challenge was installing the 56-foot-long fiberglass tank lengthwise between the hotel and porte-cochere, and next to the sidewalk abutting Pacific Coast Highway. "We had 8 inches of clearance on either side of the tank and utilities all over," says Mosser. "We faced the possibility of the highway and the two structures collapsing as we excavated." The crew used 80-foot I-beams for a slide rail system to structure the shoring.

A 70-ton crane parked on the property hoisted the tank over the corner of the hotel and lowered it into the hole. To maintain the required 5-foot separation between groundwater and discharge, the layered drainfields were 16 feet deep. On top of Mirafi (TenCate Geosynthetics) 500X filter fabric went 3 feet of 3/4-inch gravel, 12 inches of double-washed sand, 3 feet of #12 double-washed sand (finer granules), 3 feet of 1 1/2- to 2-inch gravel, and the perforated pipe in a 6-inch space covered with filter fabric.

Over the fabric went two 12-

inch layers of Class II road base separated by Geogrid textile fabric and compacted 95 percent. Geologists did compaction tests on each layer. The third layer was 18 inches of Class II compacted 95 percent, followed by the air-permeable asphalt. "We used some original native sand for topsoil, but we trucked in a lot of sand and gravel," says Mosser. "The system took nine months to install."

The FAST unit and fiberglass tanks required venting. Mosser installed 4-inch stainless steel pipe in their six combined risers, then tied them to a 4-inch CPVC Schedule 80 pipe running 160 feet to the odor control unit with exhaust fan. To start the system, Ric Vardel of IPC hauled in 10,000 gallons of seed sludge. Testing and adjustment of the system took six weeks, after which the hotel opened.

Maintenance

Vardel handles operations, maintenance and monitoring. He samples the water monthly to double-check the components and submits quarterly reports to the city. ■

MORE INFO:

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March 2009



Gary Vermeer

Company Founder Gary Vermeer Dies

Gary Vermeer, 90, founder and chairman emeritus of the Vermeer Corp., died Feb. 2 in Pella, Iowa. He is survived by his wife, Matilda, three children and their spouses. Robert Vermeer and Mary Vermeer Andringa serve as co-CEOs. Three grandchildren also are active in the company. Born Sept. 29, 1918, in Pella, Vermeer married Matilda Van Gorp in 1941. He and a cousin began the family business in 1948 after demand for a wagon hoist they had invented continued to grow. Vermeer is perhaps best known for introducing the round hay baler in 1971. He was named Iowa Inventor of the Year in 1984, was inducted into the Iowa Business Hall of Fame in 1986, the Junior Achievement Business Hall of Achievement in 1992 and the Construction Equipment Industry Hall of Fame in 1996. Today the Vermeer Corp., headquartered in Pella, manufactures agricultural, construction, environmental and industrial equipment, with dealerships in 60 countries.

Bord na Mona Opens Innovation Center

Bord na Mona Environmental Products U.S. Inc. has opened its Innovation Center, built on a 22,500-square-foot site adjacent to the Greensboro, N.C., wastewater treatment facility. The facility enables the company to increase research, development and optimization of new wastewater, air and water reuse technologies.



Mike Babrowski

Zoeller VP of Marketing Retires

Mike Babrowski has retired as vice president of marketing after 26 years with the Zoeller Co. He was an active member of the Vendor Member Division and the American Supply Association, as well as other business and professional organizations in Louisville, Ky.

SludgeHammer Receives NSF 40 Certification

The SludgeHammer aerobic bacterial generator has passed testing for NSF 40 certification. The six-month test consists of handling a daily minimum of 400 gallons of raw sewage effluent in a residential treatment system and producing an acceptable quality effluent. ■

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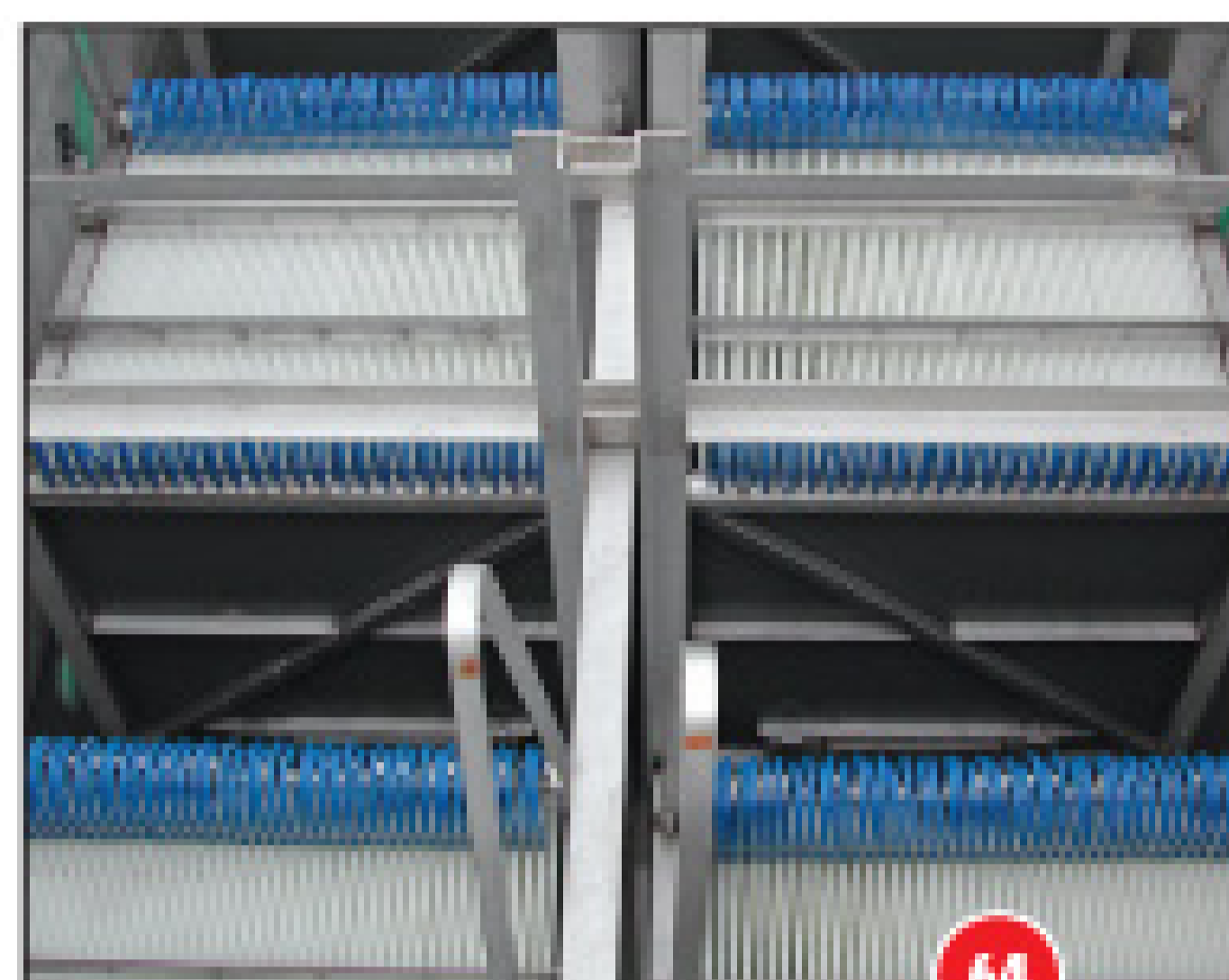
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Bord na Mona Introduces PuraM Bioreactor

The PuraM membrane bioreactor pre-engineered system from Bord na Mona Environmental Products U.S. Inc. is available in a range of mobile prefabricated carbon steel or stainless steel tank configurations capable of treating flows from 7,000 to 125,000 gpd. Engineered specifically for the decentralized municipal, community and commercial markets, the system is based on flat plate ultra-filtration membrane technology assembled into stainless steel membrane cassettes. The cassettes consist of an integral dedicated air diffuser assembly that eliminates the need for back-pulsing or frequent chemical cleaning. It does not require permeate pumps or any site-installed chemical dosing system, while achieving a typical time between recovery cleans of approximately 12 months. 336/547-9338; www.bnm-us.com.



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Jet Adds Preventative Maintenance Packs

Jet Inc. has added BIO JET-7 dry packs to its line of biological supplements for onsite systems. The quick-dissolving packages are premeasured for individual doses. Flushed down the toilet, the packets are designed to release billions of microorganisms that digest grease, fats, soap, scum, colloids and organic materials in anaerobic and aerobic wastewater treatment systems. 800/321-6960; www.jetincorp.com.

Zoeller Offers Effluent Turbine Filtered STEP Systems 25

Effluent turbine filtered septic tank effluent pumping systems from Zoeller Pump Co. are designed for simplex or duplex applications in a single polyethylene pump vault. Made to fit most specifications, its flat bottom design is for free-standing applications, while pipe supports are offered for suspended applications. The inlet is predrilled from the factory or blank for field customization. The deep pleated filter design yields high surface area, while the large, unobstructed area for float placement reduces the risk of hang-ups. 502/778-2731; www.zoeller.com. ■

WHAT'S
YOUR
OPINION



Onsite Installer welcomes letters from readers responding to articles we publish, or offering comments and opinions of interest to the industry. Submit your letter by:

- MAIL: Onsite Installer, P.O. Box 220, Three Lakes, WI 54562
- FAX: 715/546-3786
- E-MAIL: editor@onsiteinstaller.com

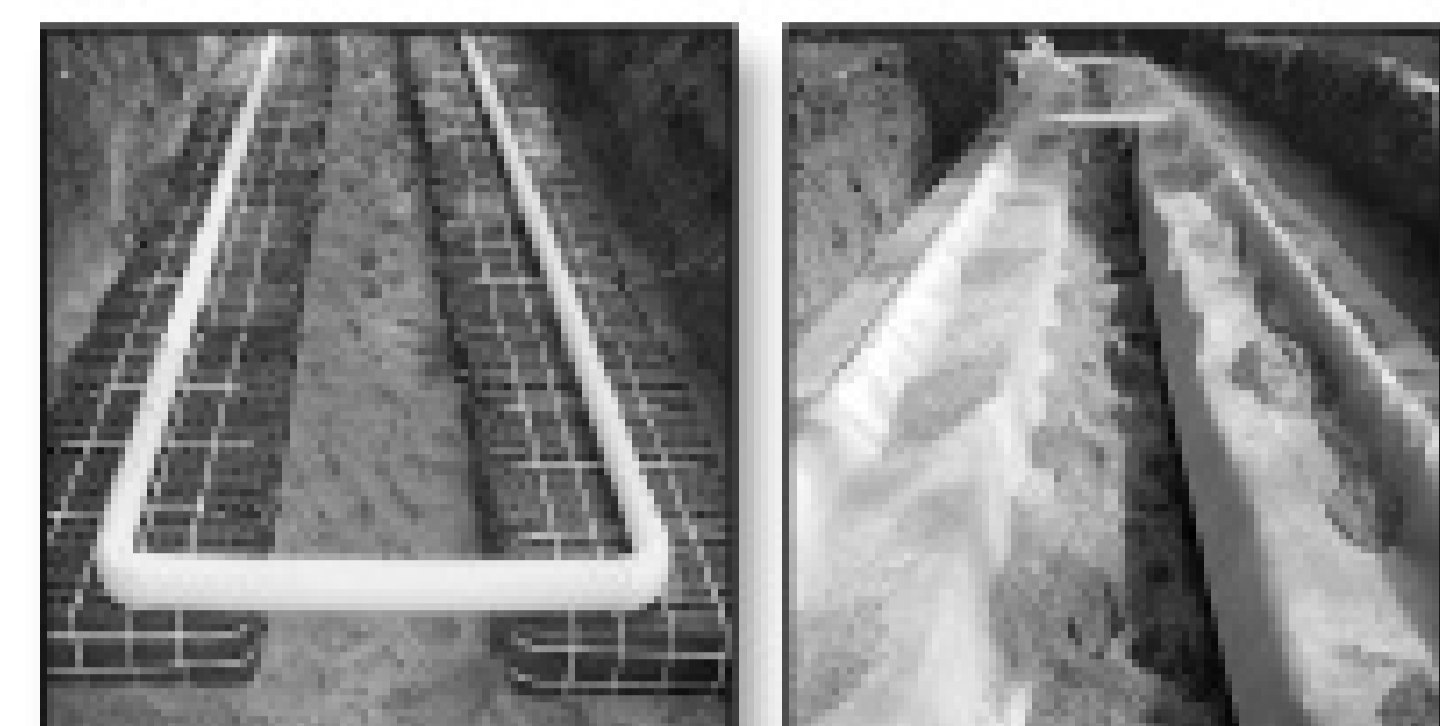
All letters must be signed. Please limit your letter to 500 words or less. We reserve the right to edit all letters for length and clarity.

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Milwaukee

NOWRA's Annual Conference & Expo serves as the premier conference for the conveyance of new research, trends, regulations and practices in the onsite and decentralized industry.

Exciting tours will take you out and about in Milwaukee!

- Four decentralized systems featuring ATU's, mounds, constructed wetland and drip distribution systems in residential, commercial and school wastewater applications.
- Tour of Water Reclamation Facility of the Milwaukee Metropolitan Sewerage District that produces Milorganite, a high quality, Class A/Exceptional quality Biosolid that is marketed around the country.

Things to do and see

- Milwaukee Public Museum: Always something exciting going on, including NOWRA's offsite reception!
- Miller Brewery Tour: Take a tour through the famous Miller brewery.
- Milwaukee Art Museum: Located on Lake Michigan the museum has a beautiful display of art in perhaps the prettiest building in Milwaukee.

Visit the Trade Show Exposition

- Meet with exhibitors to learn about the latest in onsite design and products.

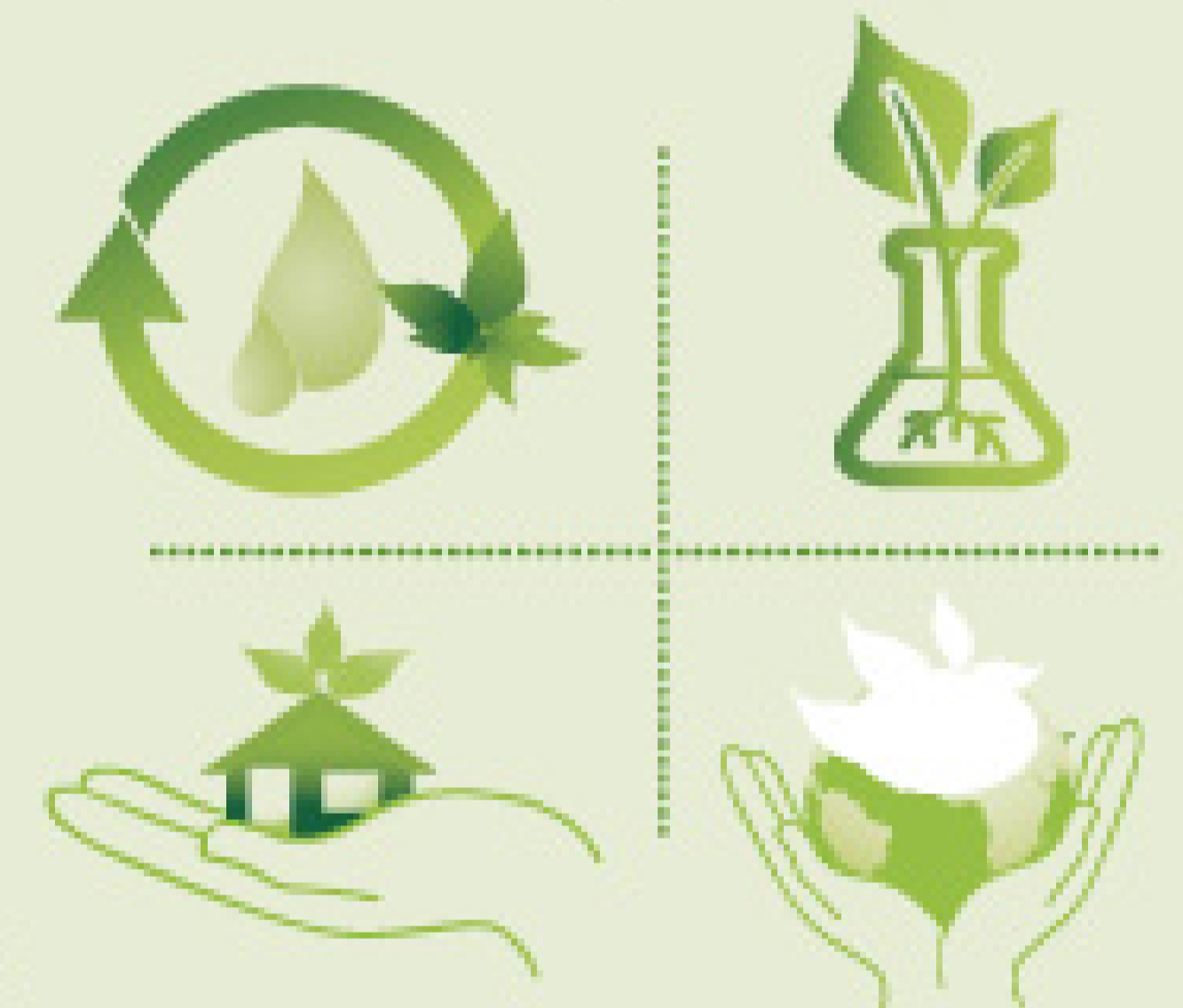


Onsite: The Sustainable Wastewater Opportunity

Onsite / decentralized wastewater treatment has always been a "green" solution for water recycling. NOWRA is proud to promote onsite systems as cost-effective, environmentally safe and long-term alternatives for wastewater treatment.

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- Wastewater Reuse Case Study
- Recent Trends in Decentralized Wastewater Management
- Small Community Wastewater Treatment
- Nitrogen Treatment, Research and Policy
- Innovative Products, Technologies, and Solutions
- Onsite System Performance, Reliability & Sustainability
- NOWRA's premier program, "The Basics of Onsite Systems -A to Z"
- The Midwest States Code Forum
- Weathering the Economic Storm: Business Survival



Don't miss the Symposium on Pharmaceuticals & Personal Care Products

NOWRA will host a pre-conference workshop on April 6th focusing on Pharmaceuticals and Personal Care Products in Wastewater, Surface Water, and Groundwater. A full day's line up of speakers will present the latest research on this issue.



NOWRA 18th Annual Technical Conference & Expo

To learn more and to sign-up online, visit
www.NOWRA.org
or call
800.966.2942

MOU Strengthens Onsite Management

NOWRA, NAWT, the U.S. EPA, and 13 water quality organizations have signed a memorandum of understanding (MOU) for Decentralized Wastewater Management, renewing a commitment to improve national decentralized wastewater treatment system performance.

Goals of the new agreement include strengthening external partnerships and improving practitioner competency, management practices, research and technology transfer, accountability, control and oversight through enhanced state, tribal and local program implementation.

Improving public awareness, education programs and information materials are viewed as ways to help local officials make better decisions, as is supporting the principles outlined in the EPA Voluntary Management Guidelines and Management Handbook for Decentralized Systems. The three-year agreement includes:

- Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT)
- National Association of Towns and Townships (NATaT)
- National Association of Wastewater Transporters, Inc. (NAWT)
- National Environmental Health Association (NEHA)
- National Environmental Services Center (NESC)
- National Onsite Wastewater Recycling Association Inc. (NOWRA)
- Rural Community Assistance Partnership Inc. (RCAP)
- Water Environment Federation (WEF)
- Association of State and Interstate Water Pollution Control Administrators (ASIWPCA)
- Ground Water Protection Council (GWPC)
- State Onsite Regulators Alliance (SORA)

- Water Environment Research Foundation (WERF)
- Association of State Drinking Water Administrators (ASDWA)
- Association of State and Territorial Health Organizations (ASTHO)

MOU partners will work to advance the awareness of decentralized systems as potential answers to centralized infrastructure challenges, and provide opportunities to implement innovative technologies, develop water scarcity strategies, and implement long-term sustainability initiatives in urban and rural settings.

Missouri Hosts Installer Training Program

The Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT), NOWRA, and National Environmental Health Association (NEHA) selected the Missouri Smallflows Organization (MSO) to host their new Installer Training Program on March 5-6 in Liberty, Mo. The optional NEHA exam follows on March 7. For information, visit www.mosmallflows.org/CIDWTrainingCourse.html.

Fees Increase 40 to 60 Percent

The Oregon Onsite Wastewater Association newsletter reports that the state's Department of Environmental Quality (DEQ) is requesting approval to increase fees for site evaluations, existing system inspections, permits, product reviews and variances by \$1 million for 2009-2011. The 40- to 60-percent increases, effective in early 2010, take into account rising program costs. Application fees were last increased in 1998.

While onsite applications decreased about 35 percent in 2008, the DEQ still received more than 2,500 applications. The additional revenue would restore 2.5 full-time positions at the agency to process applications. Without the increase, two offices will close and another will reduce its staff,

increasing delays. The installation season in Oregon is June through September.

Charting Path for Success

Nova Scotia onsite leaders in partnership with Nova Scotia Environment regulators are providing new options for managing liquid waste. According to the newsletter of the Ontario Association of Sewage Industry Services (OASIS), one initiative, the four-year, \$2.75 million Septage Treatment Facility Assistance Program, offers assistance to septage lagoon operators to upgrade facilities or construct replacements, and technology to meet the department's revised guidelines for the handling, treatment and disposal of septage.

The Septage Treatment program enabled the municipality of the District of Chester to become the first in the province to purchase the Altinex dewatering truck, which pumps septic tanks, then dewateres the septage using Masko-Zoll technology. Liquid is returned to the septic tank and the dewatered solids are composted. The truck handles 10 times more septage than current vacuum trucks, saving about 80 percent on fuel annually. The truck, developed in Norway, was refitted on a North American chassis by ABCO Industries Ltd., Lunenburg, Nova Scotia (www.abco.ca).

Another initiative, the Environmental Home Assessment Program, provides onsite owners with a septic system assessment, water quality sampling kit, water-saving device, and samples of environmentally friendly septic system cleaners. After the assessment, participants who want their tanks pumped will receive a \$100 rebate. Low-income households may be eligible for a grant up to \$3,000 to repair their systems.

The agency also issued pilot approvals for SoilAir, MicroFast and RetroFast pretreatment units for existing onsite systems with disposal fields designed by professional engineers. The department approved

the Ecoflo peat module treatment system and the Micro-Modular peat filter system for onsite systems. The latter, a new lightweight filter designed and produced by Brookfield Concrete Products Ltd., was subjected to extensive testing and presumed to be the first study in the province that assesses the treatment efficiency of a peat filter exposed to different loading rates.

IOWA

According to the National Environmental Health Association, the Iowa Onsite Wastewater Association leads the nation in certified onsite installers. The state has 27 contractors, followed by 19 in Ohio. This is the second year that Iowa has taken the lead.

CALENDAR OF EVENTS

March 1-4

Ontario Onsite Wastewater Association Conference and Exhibition, Sheraton Conference Centre, Richmond Hill. Call Denis Orendt at 905/372-2722 or visit www.oowa.org.

March 3-4

Texas On-Site Wastewater Association Conference, Waco. Call 888/398-7188 or visit www.txowa.org.

March 8-10

Pennsylvania Association of Sewage Enforcement Officers Conference, Grantville. Call 717/761-8648 or visit www.pa-seo.org.

March 16-19

California Onsite Wastewater Association Exhibition and Technical Conference, Hilton Arden West, Sacramento. Call 916/727-2692 or visit www.cowa.org.

March 23

Granite State Designers and Installers Association Spring Septic System Conference and Expo, Radisson Hotel, Manchester, N.H. Call 603/228-1231 or visit www.gsdia.org.

March 23-24

Tennessee Onsite Wastewater Association Continuing Education Workshop and Annual Meeting, Embassy Suites, Murfreesboro Hotel and Conference Center. Call 615/890-4464 or e-mail Theo Terry at theo.terry@bearonsite.com.

April 3-4

Alabama Onsite Wastewater Association Annual Trade Show, Pelham Civic Complex, Pelham. Call 334/396-3434 or visit www.aowa.org.

April 6-9

NOWRA Technical Exhibition and Conference, Midwest Airlines Convention Center, Milwaukee, Wis. Call 800/966-2942 or visit www.nowra.org.

TRAINING & EDUCATION

Soils Information Online

Soil survey manuscripts with soils, data, maps, diagrams, tables and other details are online at <http://websoilsurvey.nrcs.usda.gov>. Posted by the United States Department of Agriculture-Natural Resources Conservation Service (NRCS), the Web Soil Survey allows visitors to create and print a soils map for any U.S. location and obtain reports on the suitability of the soils.

The reports identify potential soil limitations including depth to a restrictive layer, predicted seasonal high water table, potential for flooding, and suitability for sewage disposal. For assistance with the program, call Dani Aleshire at 541/967-5925, ext. 124, or e-mail dannelle.aleshire@or.usda.gov. Anyone living in a county without an online soil survey manuscript should contact the local NRCS office for a copy. To find the nearest office, visit <http://offices.sc.egov.usda.gov/locator/app>.

Sand Fact Sheet Available

The Ohio State University Extension published *Sand Size Analysis for Onsite Wastewater Treatment Systems: Determination of Sand Effective Size and Uniformity Coefficient*. Graphs and tables in the four-page fact sheet explain why the most important feature of the sand is not the grains, but the pores the

sand creates. It's a free download at <http://ohioline.osu.edu/aex-fact/pdf/0757.pdf>.

Onsite Tour

The New York Onsite Wastewater Treatment Training Network has an Alternative Onsite Wastewater Treatment Technology Training & Project Tour on May 27-28 in Skaneateles. Call SUNY Delhi at 607/746-4545 or visit http://www.delhi.edu/bcs/otn_wastewater.

Alabama

Licensing classes are the joint effort of the Alabama Onsite Wastewater Association (AOWA) and University of West Alabama (UWA).

- April 3-4 – Continuing Education, Pelham
Call 334/396-3434 or visit www.aowa.org.

Minnesota

The University of Minnesota Extension has these classes:

- April 14-16 – Basic Design of Onsite Systems, White Bear
- April 17 – OSHA Competent Person/Pipelayer Certification, Sauk Centre
- April 27-29 – Introduction to Onsite Systems, Grand Rapids
Call Nick Haig at 800/322-8642 (612/625-9797) or visit <http://septic.umn.edu>.

Missouri

The Missouri Smallflows Organization is offering these CEU courses:

- April 21 – Troubleshooting, Moberly
- April 22 – Hydraulics, Moberly
Call 417/739-4100 or visit www.mosmallflows.org.

Virginia

The following courses by the Virginia Onsite Wastewater Recycling Association (VOWRA) and Virginia Center for Onsite Wastewater Training (VCOWT) are at Blackstone unless stated otherwise:

- April 15 – Proprietary System Training (VOWRA)
- April 23 – A to Z of Onsite Wastewater, Fredericksburg (VOWRA)

For VCOWT classes, contact Debbie Campbell at 434/736-2011 or visit www.southside.edu/programs/wastetreat. For VOWRA courses, contact Jeff Barr at 703/771-5250 or visit www.vowra.org.

Washington State

The Washington Onsite Sewage Association and Washington State Department of Health in cooperation with Washington State University are offering these certification courses at the training center in Puyallup:

- April 8 – Maintenance Basics
- April 15 – Pumper 101
- April 22 – Designers: Subsurface Drip Systems
Call WOSSA at 253/770-6594 or visit www.wossa.org. ■

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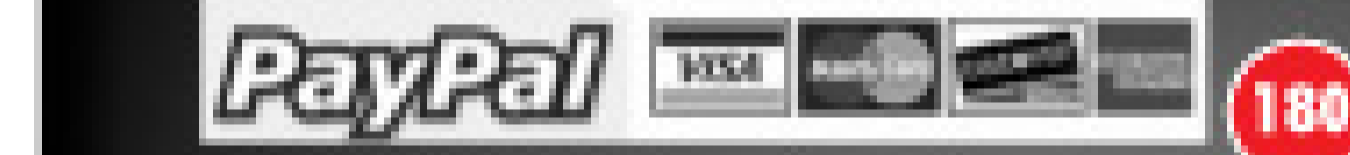
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