

September

2008

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# Protecting the Lakes

**A problem-solving approach to onsite  
regulation in Schuyler County, N.Y.**

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### Protecting the Lakes

By Gil Longwell

**ON THE COVER:** Schuyler County, N.Y., takes an innovative approach to onsite system management as part of its watershed protection initiative. Here, staff members with the county Watershed Protection Agency have uncovered a flooded distribution box and sewer line trench while investigating a problem onsite system as part of a regular inspection program. (Photography by Jennifer Geck)

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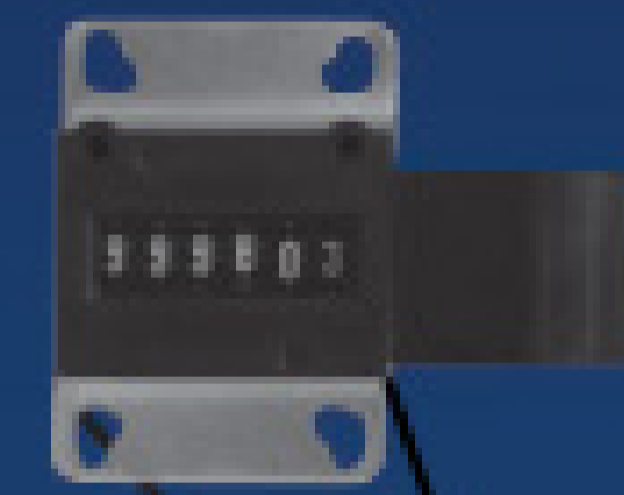
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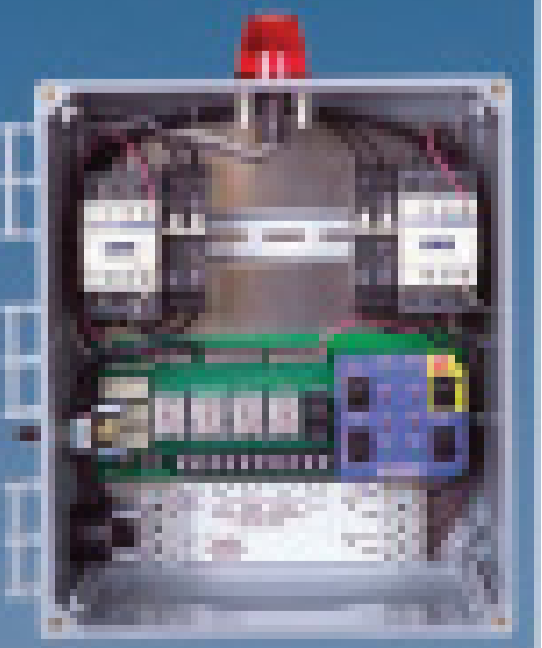
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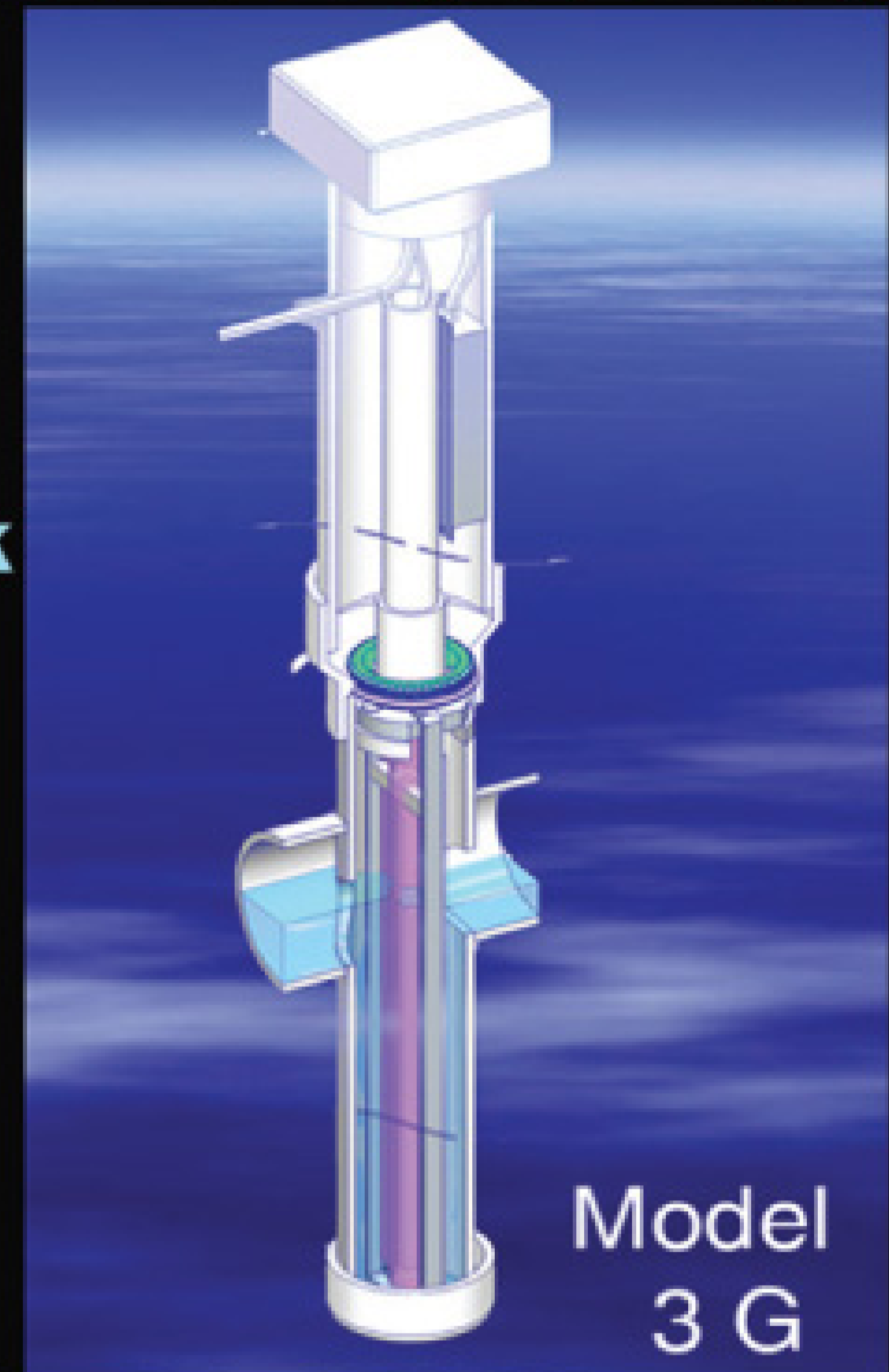
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## Are Installers Homebodies?

Maybe this is the year to break with past practice and attend one of the industry's national trade shows and educational programs

By Ted J. Rulseh

Since we started this magazine almost five years ago, people have often told us that onsite installation is a local business.

Installers, it's said, stay within a small orbit. They take their local training, get tanks and supplies from a local distributor, buy equipment at the local dealer, do business in a county or two. They're not a national community.

The existence of this magazine is one piece of evidence to the contrary. Another is the installer population that attends our Pumper & Cleaner Environmental Expo. Yet evidence for the other side remains.

For example, the National Onsite Wastewater Recycling Association (NOWRA) annual technical conference is typically dominated by educators, regulators and consultants. I've seen installer attendance there as low as 10 percent, maybe lower. And installer representation at our own show also tends to be on the low side.

### At the academy

Finally, there's the annual NOWRA Installer Academy, held in Las Vegas in December. It started in 2005 with a skeleton crew on hand. It has grown significantly and last year added some excitement with a Ro-de-Hoe equipment operating competition. Still, attendance was just 250.

**The broader the venue you attend, the better your chances of encountering someone who knows more in these areas than you do, and so the better your chances of learning and improving your business.**

That's a respectable figure, but when you consider how many installers there are — this magazine mails to some 16,000 design and installation professionals — it looks like a small slice of the market. So, why don't more installers attend the one national industry event held just for them?

Maybe it's because installers can in fact get most of what they need, in materials and education, close to home. In particular, many state associations hold annual conferences and have excellent training and certification programs.

Still, no matter what industry you're in, there's no substitute for going to a larger-scale event and

learning new things and improving your business.

All that aside, there are few things more refreshing than leaving the daily cares of business behind for a while and sharing time — business and social — with people who come from different states, speak in different accents, but share your experiences and interests.

So maybe this is the year, if you haven't already done so, to get beyond local. Your first great opportunity is the Installer Academy, Dec. 8-10. Think of it this way: Here's a chance to go to Vegas and bet on a sure thing.

### Take your pick

All it will cost you is a flight, a few nights' lodging and the price of admission. And you are certain to gain value far in excess of what you spend. Just one choice insight or bit of information can be worth literally thousands of dollars, not just next year but every year.

Then, Feb. 25-28, there's our Pumper & Cleaner Expo in Louisville, Ky. There you'll get a bigger look at the environmental service industry and how onsite design and installation fit in. You'll learn more about your own area of business, and you may encounter a new service line or two that offer promise.

Why not make this the year? Make the commitment to a bigger perspective on your business. Pick one of these events and go. Then the next year, attend the other. Your business will be better for it. ■

getting a broader perspective on the industry. We can grant that installing is different everywhere because topography and soils vary. So do regulations, and so do the types of treatment systems permitted. But many aspects of the industry are uniform.

### What stays the same

For example, no matter where you operate, the principles of running a business — marketing, accounting, purchasing, staffing, salaries, benefits — remain the same. So do the techniques of operating and maintaining equipment, and the fundamentals of soil science, hydrology, pump selection and surveying.

The broader the venue you attend, the better your chances of encountering someone who knows more in these areas than you do, and so the better your chances of

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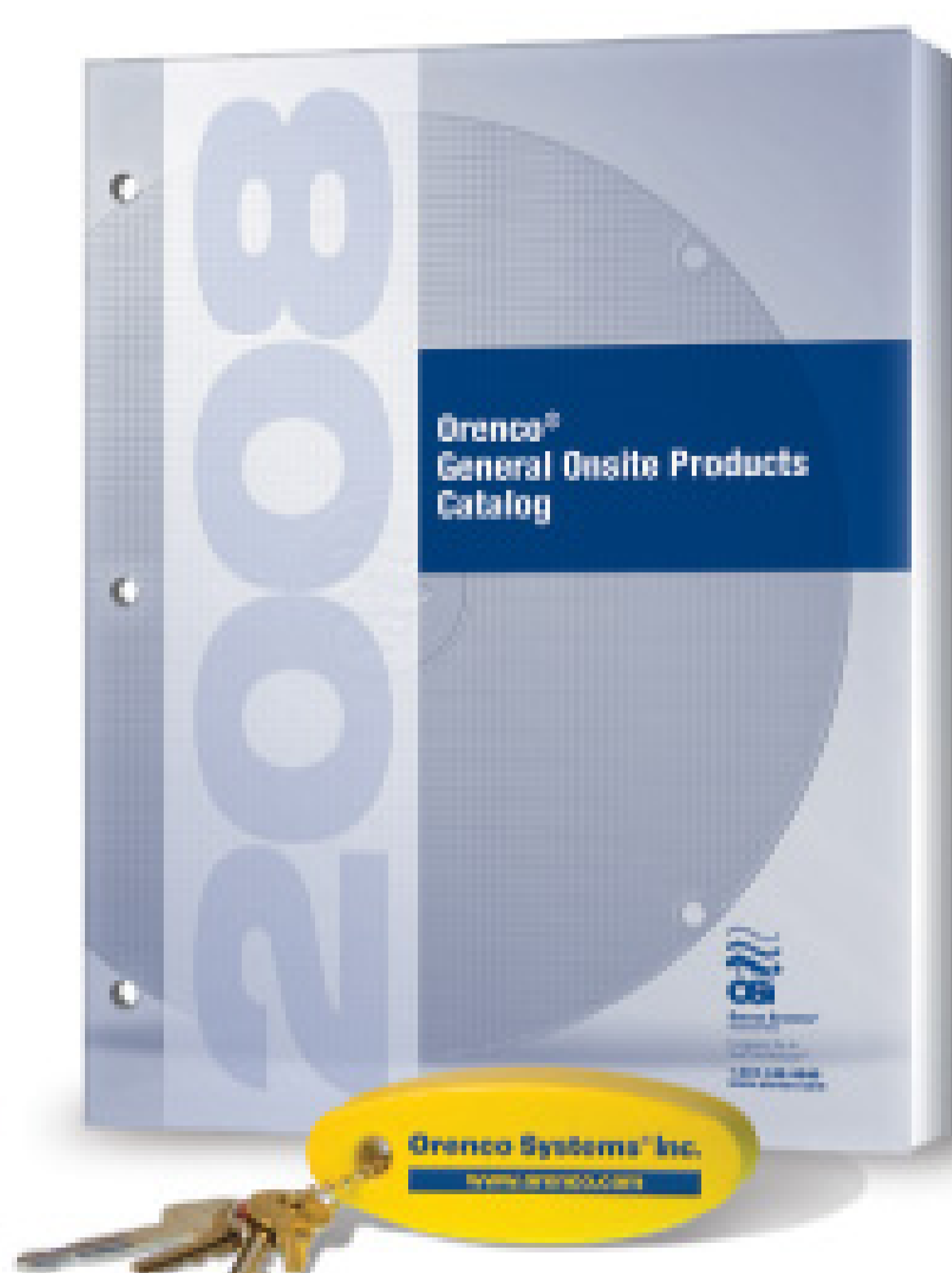
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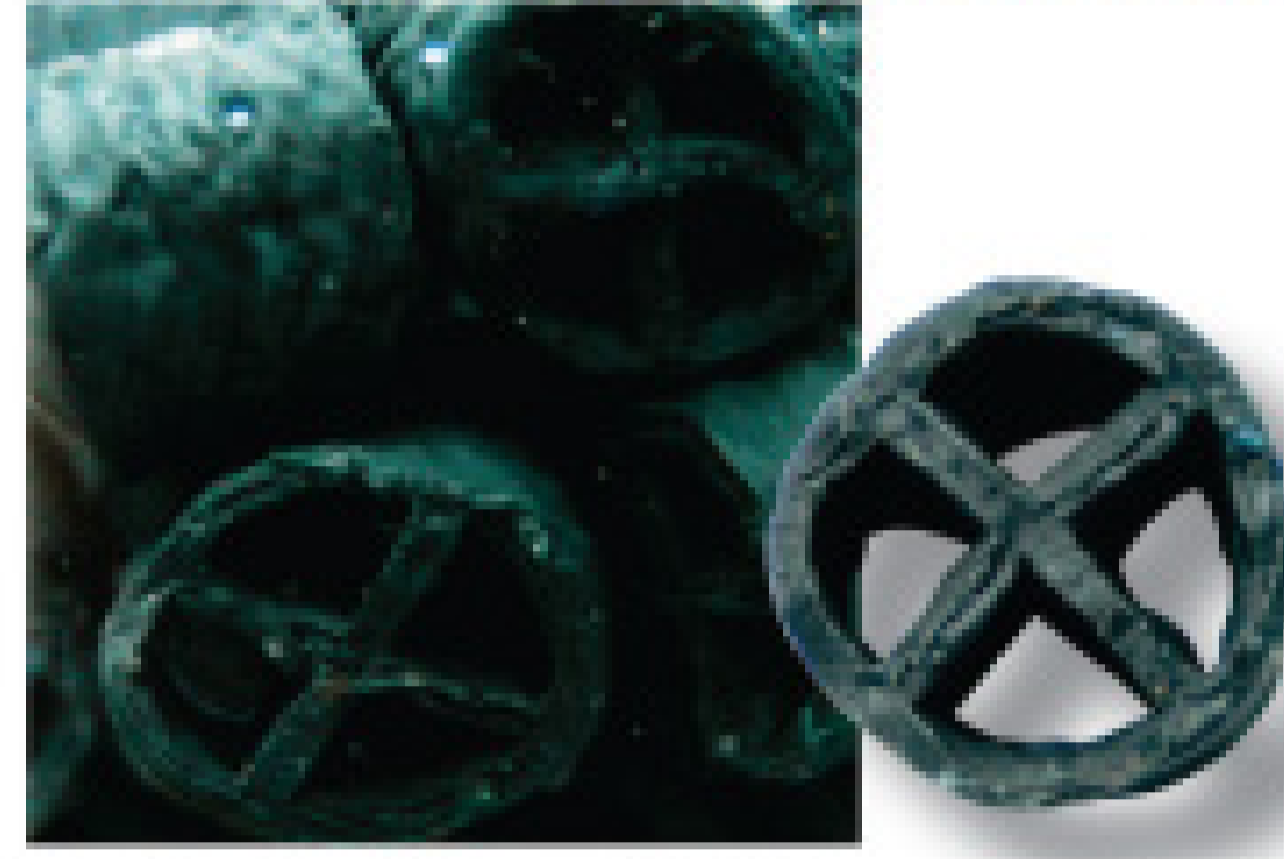
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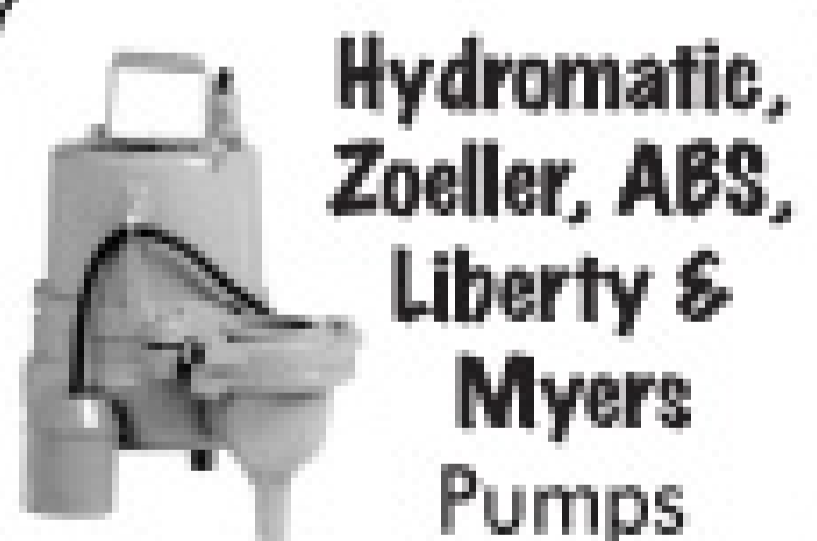
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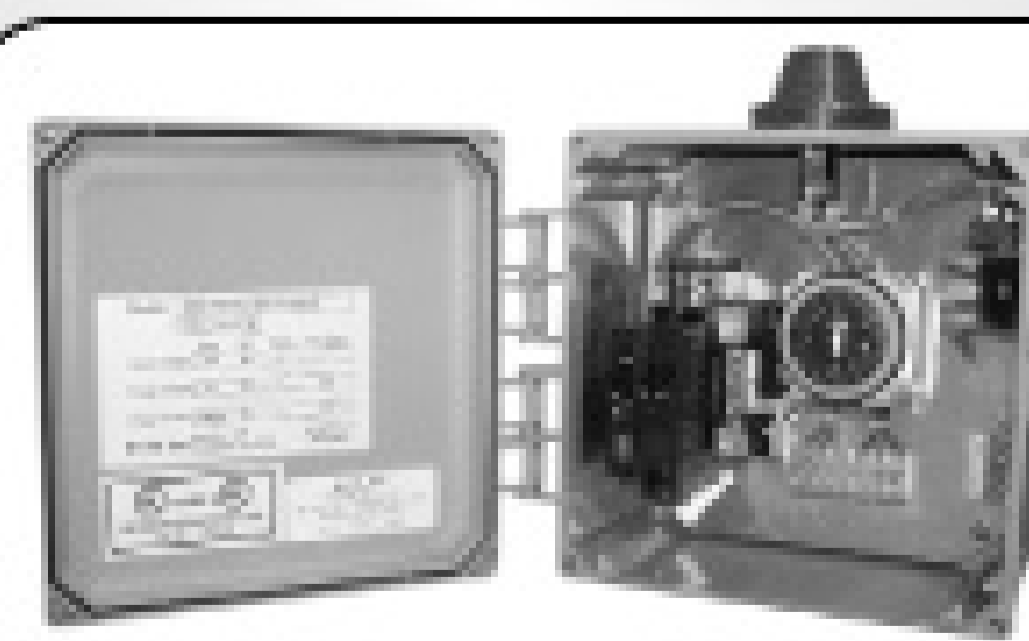
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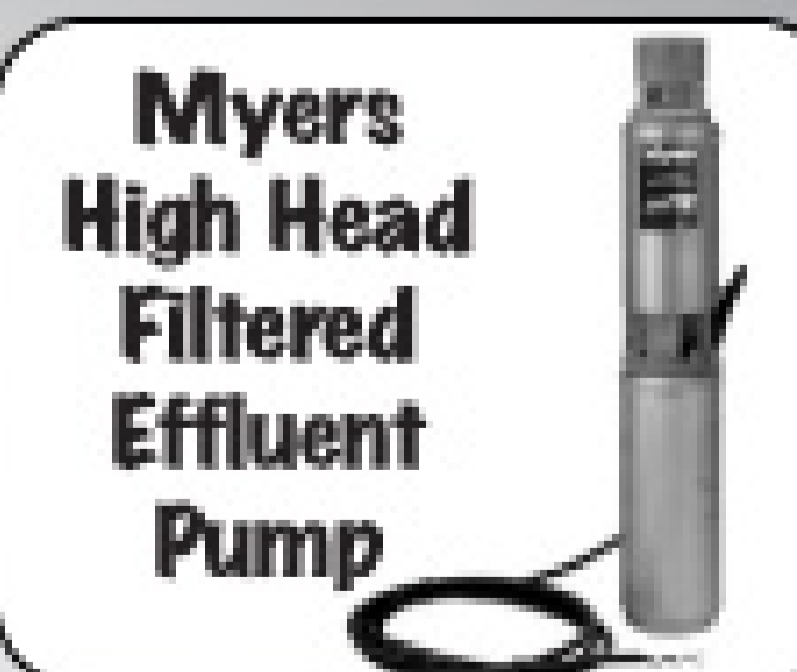
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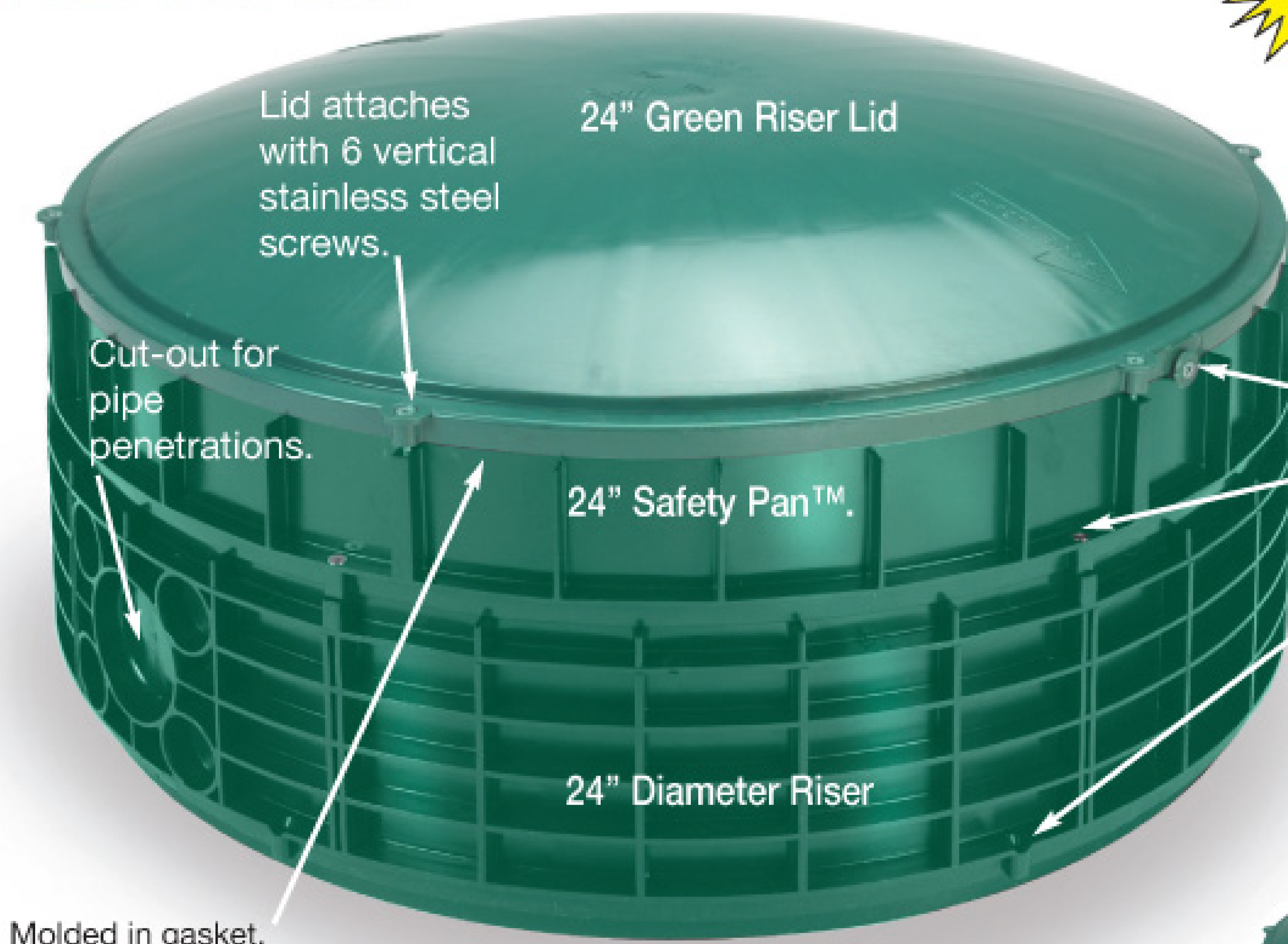


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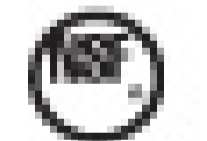
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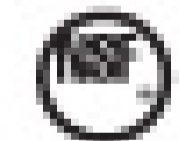


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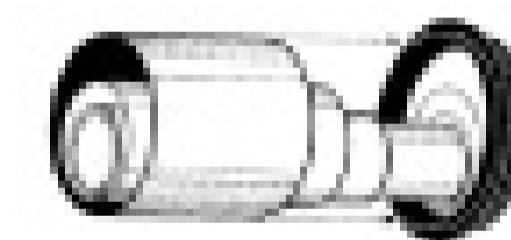
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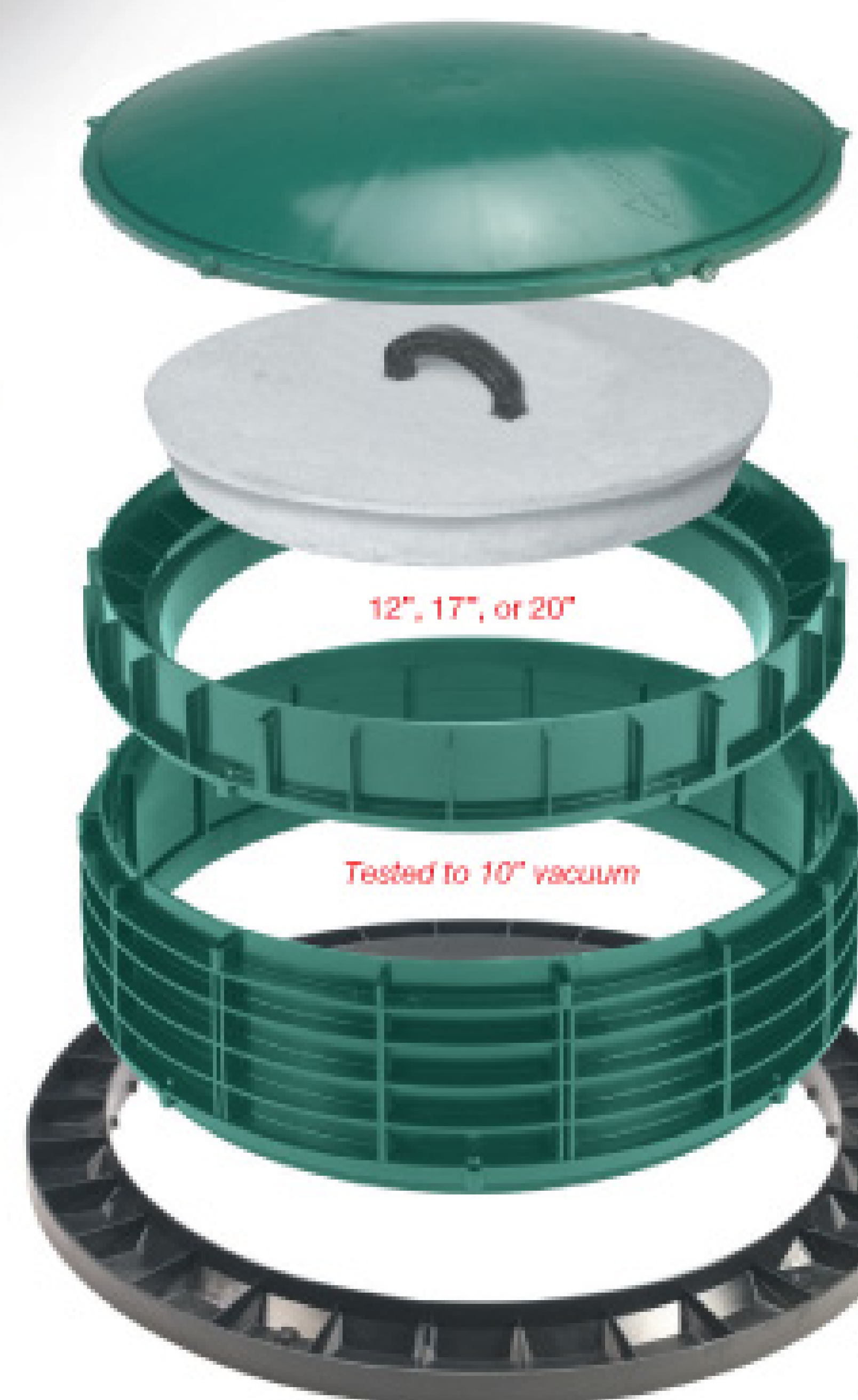


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4,951,914,  
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Jim Anderson and David Gustafson are with the University of Minnesota's widely recognized onsite wastewater treatment education program. Anderson is director of the university's Water Resources Center and Gustafson is the university's extension onsite sewage treatment educator. Readers are welcome to submit questions or article suggestions to them at [ander045@umn.edu](mailto:ander045@umn.edu).

# The Color of Soil

Different colorations in soils on installation sites provide highly valuable information about the type of system you need to install

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

In last month's article, we explained the need for installers to have basic skills to identify soil texture. The next most important soil feature to recognize and evaluate is soil color.

Color is one of the most useful properties for soil identification and appraisal. It is also fairly easy to determine. Color can be the primary indicator of zones of periodic soil saturation and of the separation distance needed to provide adequate treatment. In addition, color can help you determine if you are working in a disturbed area — a factor that could affect the type or size of the system.

## On the surface

You can use the color of the surface layer to determine the organic matter content of the soil. It can indicate the effects of past vegetation or human disturbance. Some soils exhibit color directly inherited from the parent rock. They provide clues to identify and evaluate soil.

There are two primary coloring agents in soil: organic matter and iron. Most people recognize the dark surface soil as being rich in organic material. The varying shades of red, yellow and gray usually relate to the quantity and form of iron present. Red means the iron is oxidized and not hydrated with

water. Yellow indicates hydration and sometimes less oxidation. Gray indicates chemical reduction due to wetness and lack of oxygen. This indicates the occurrence of periodic saturated soil conditions.

Soil horizons may contain many different colors. These colors are derived from either the native parent material or the soil-forming process. These processes may result in the formation of clay films, silt coats, organic stains, nodules, and oxides, all of different colors. One soil-forming process that needs special attention is when the soil color indicates a saturated condition.

The presence of a specific kind of mottling, now referred to by soil scientists as "redoximorphic features," is used to estimate seasonal high-saturated soil conditions. Many state regulations require identification of these features. You can use them to identify the depth to the seasonally high water table, even during dry periods when there is no direct evidence of water. This level then sets the base to determine the elevation of the bottom of the soil treatment system. This will then determine the depth of excavation or whether you need an at-grade or mound system.

## Color variables

Color is composed of three variables:

- **Hue:** The dominant color, such as red, yellow, green, blue or purple.
- **Value:** The measure of the degree of darkness or lightness of color, in relation to

the total amount of light reflected, such as light red or dark red.

- **Chroma:** The measure of the purity or strength of color, or its departure from a neutral of the same lightness, such as dull red or bright red.

Soil color is measured by comparison with a standard color chart. The chart used to evaluate soils is the Munsell color system. The standard Munsell chart for soil color consists of about 322 color chips, systematically arranged on nine cards assembled into a loose-leaf notebook. Additional cards are available for reddish hues and for the bluish and greenish hues of gleyed soils.



An example page from the Munsell Soil Color book.



Soil color can help determine whether a soil is seasonally saturated whether or not it is wet the day the installer is there. When moist, the soil will have dull and gray colors. When dry, there will be a combination of reds and grays.

by the horizontal scale across the bottom of the chart. The value notation of each chip is indicated by the vertical scale in the far left column of the chart. Opposite each page of color chips is a page of color symbols and corresponding English names, so that color can be expressed both by Munsell notation and color name. So a notation might be dark brown 10YR

5. If you are not satisfied with the match, flip forward and back to see if there is a better match.
  6. Record the chosen color or colors.
  7. Break the ped to see if the interior color is different. If so, record those colors.
- Rarely will the match be perfect, so you need to select the closest match.

The presence of a specific kind of mottling, now referred to by soil scientists as "redoximorphic features," is used to estimate seasonal high-saturated soil conditions. Many state regulations require identification of these features. You can use them to identify the depth to the seasonally high water table, even during dry periods when there is no direct evidence of water.

3/3, which is the English name, followed by hue, then value and finally chroma.

#### Reading color charts

To read the soil color using the Munsell charts, use the following procedure:

1. Take a ped from the horizon to be examined. Do not crush or break the soil ped.
2. Adjust the water content to moist.
3. Estimate the basic soil color (hue).
4. With the sun at your back, hold the sample behind the holes of the page. Match as closely as possible.

Installers need to be able to interpret the meaning of the colors described. If the soil color is uniformly reddish or brownish, that indicates horizons that are well drained and consistently provide adequate oxygen to enable treatment of septic tank effluent.

As the abundance and contrast in soil mottles increase, that means the water is not draining naturally, and the system will need to be installed to provide adequate separation above this zone. Gray or olive colors indicate even longer periods of saturation. ■



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"Rules and Regs" is a monthly feature in Onsite Installer™. We welcome information about state or local regulations of potential broad interest to onsite contractors. Send ideas to editor@onsiteinstaller.com.

# Pennsylvania Governor Blocks Data Quality Act

By **Scottie Dayton**

Supported by state Senate and House leadership, a bill introduced as the Data Quality Act would require agencies to share the data supporting their regulatory decisions. The legislation will help ensure the use of current and reliable data, studies and scientific research by state agencies during the writing of new regulations. The legislation amends the Regulatory Review Act to expand the scope of review by the Independent Regulatory Review Commission to include the examination of the quality of data, studies, reports and information

underlying state regulations. However, Gov. Edward Rendell is blocking this bill that places the burden of justification on regulatory agencies.

## Arizona

The Department of Environmental Quality is recommending that any new developments in the Luna Lake area connect to the Alpine Domestic Water Improvement District (DWID) to limit the negative effects of total nitrogen. If hooking to the sewer is impossible, then new septic systems should voluntarily incorporate nitrogen-

reducing technologies. The department's long-term goal is to connect as many residential and commercial facilities to the sewer as possible. The Alpine DWID is developing a sewer master plan that will tie many previously unsewered areas to the collection system.

## Connecticut

The Department of Environmental Protection concluded that sewers in Old Saybrook were polluting the groundwater. Town officials and members of the Water Pollution Control Authority (WPCA) objected to the idea of replacing the system, calling sewers "old technology" and a "true economic burden." After targeting 15 different beach communities where most of the pollution occurs, and inspecting each lot separately, officials turned to individual onsite systems with nitrogen-reduction technology to fix specific problems. First Selectman Michael Pace called the individual solution method "tremendously cheaper" than sewers, by as much as 50 percent. The state passed special legislation to create a Wastewater Management District for Old Saybrook, but the town must pass the referendum before any upgrades can be completed.

## Florida

The bill to establish grant monies for low-income property owners to offset the expense of installing nitrogen-reduction systems died in the Senate due to its massive price tag. However, the 2008 Legislature appropriated \$1 million to further develop cost-effective nitrogen-reduction strategies.

Part of the appropriation directs the Department of Health (DoH) to submit a report by Oct. 1 identifying the costs to implement a

mandatory statewide five-year septic tank inspection program to be phased in over 10 years. The DoH received an additional \$150,000 to provide a statewide inventory of onsite systems, thereby ensuring that it can enforce an inspection program if one is created. The governor may still veto the appropriation.

## New York

Effective May 1, the state's new Municipal Separate Storm Sewer Systems (MS4) general permit mandates that some 20 municipalities and three counties develop management plans for onsite systems as part of the illicit discharge detection and elimination (IDDE) plan. The two-year permit requires licensed professional engineers or architects to design the drainfields for failing systems, then file a written certificate of compliance, thereby accepting the liability for the installer.

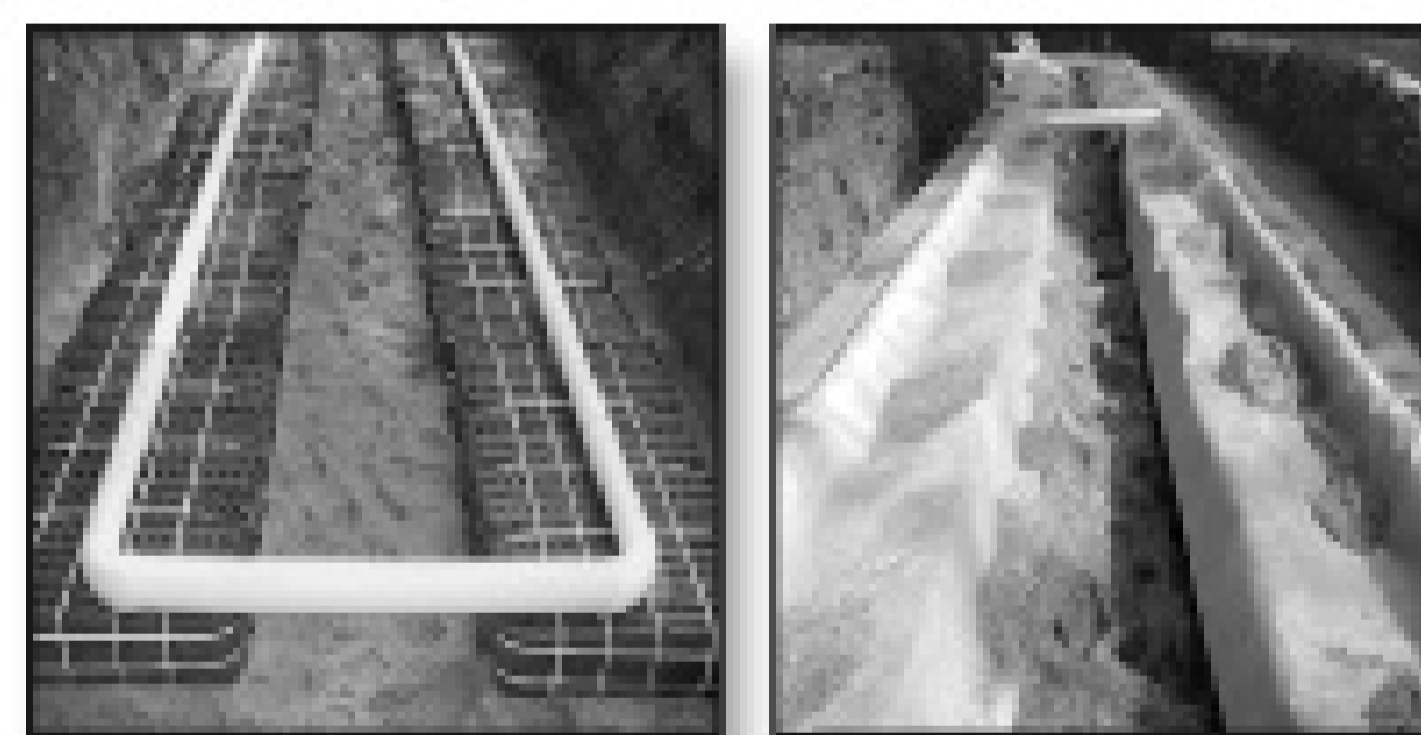
Permittees within the area defined as "New York City east of the Hudson Watershed" are required to develop, implement and enforce a program that requires property owners to inspect, repair or replace failing systems by Dec. 31, 2009. To comply, stormwater officials will have to request local governments to enact ordinances that give them the authority to carry out the orders.

New York is not the only state where onsite systems are becoming part of stormwater programs. The Illinois EPA, Region 5, also has a general permit covering discharging onsite systems. The link to the New York permit and supporting documentation is at [www.dec.ny.gov/chemical/8468.html](http://www.dec.ny.gov/chemical/8468.html). ■

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# More Control in Your Hands

Already standard on many compact track loaders, easy-to-use joysticks are replacing conventional lever and pedal controls on more skid-steer loaders

By Greg Northcutt

**E**ver since the first skid-steer loaders rolled off production lines nearly 50 years ago, operators have used hand levers and foot pedals to drive the machines and operate the loader arms and attachments.

These controls are linked to the swash plate of hydrostatic pumps that manage the hydraulic power for the drive wheels and to control valves for loader functions. However, since being introduced on skid-steer loaders and compact track loaders several years ago, much easier-to-operate joystick controls have caught on quickly.

These controls replace the shoulder, arm and elbow or toe and heel movements required to operate

## Worth the price

Joystick controls add about \$2,000 to the cost of a typical skid-steer or compact track loader. But manufacturers say the improved comfort and ease of operation more than pay for the extra cost by reducing operator fatigue, raising productivity and minimizing any adjustments or repairs to lower maintenance costs.

Gehl Company introduced joystick control on its larger skid-steer and compact track loader models around four years ago. "Since then, demand has definitely increased, and we now offer it on smaller models, too," reports Kelly Moore, product manager of skid-steer and compact track loaders.

**"Joystick control is definitely a growth marker for the industry. I can see the day when manufacturers will offer joystick control exclusively."**

Gregg Zupancic / John Deere

the longer-throw mechanical controls for much shorter and more comfortable hand and wrist movements. At the same time, joystick controls replace mechanical linkages with simpler, more durable hydraulic lines or electrical wires to operate the machine's hydrostatic system.

Gregg Zupancic, John Deere product marketing, observes, "Joystick control is definitely a growth marker for the industry. I can see the day when manufacturers will offer joystick control exclusively."

In fact, some manufacturers, like Caterpillar, Gehl and Takeuchi, offer only joystick pilot controls on



Joystick controls on a Takeuchi compact track loader.

their compact track loaders. For most manufacturers, joysticks are one of several options.

## Using hands and feet

Mechanical controls are still the most popular choice for skid-steer loaders. Whether you're operating a hand lever or foot pedal, the farther you move the control, the faster the machine operates. Release the controls and the functions return to neutral.

The original hand-foot skid-steer controls, invented by Bobcat, have two hand levers, one for the right drive wheels and one for the left drive wheels, for forward and reverse drive and for turning. Two foot pedals control the lift arms and bucket. Pushing the left pedal with

the heel raises the arm, and pushing with the toe lowers the lift arm. On the right pedal, toe pressure tilts the bucket forward, and heel pressure tilts it back.

Case introduced the first hand levers to control both drive and loader functions. The left lever controls the drive motor for the left wheels and raises and lowers the loader arms. The right lever operates the right wheels and the bucket curl and dump.

To accommodate operators with different control pattern preferences, most manufacturers offer both systems. Gehl skid-steers, for example, come standard with T-bar controls for all-hand operation. A hand-foot system is also available. Meanwhile, hand and foot controls are standard on John Deere skid-steers, but the company also offers

a factory-installed hands-only control.

Bobcat's optional Advanced Control System lets you choose between standard hand-foot controls or all-hand control mode at the flip of a switch on the dashboard. In the all-hand mode, the left hand controls left-side drive and lift functions and the right hand controls right-side drive and tilt functions and auxiliary hydraulics.

### Joystick systems

Many operators choose standard controls because that's what they're used to, Moore notes. "However, unless you're really sold on hand and/or foot controls, the joystick just makes more sense in the long run because of its advantages," he says.

Most manufacturers offer one of two types of joystick controls. Takeuchi compact track loaders have hydraulic-over-hydraulic control. "This system uses a joystick to

John Deere skid-steers and compact track loaders, have an electronic board that senses movements of the joystick and transmits signals over electrical wires to a control unit that regulates opening and closing of the various valves and spools in the hydrostatic drive system and loader hydraulic systems.

Depending on the manufacturer, skid-steer and compact track loaders are available with ISO control pattern (drive functions in the left hand and loader arm/bucket functions in the right hand), H-pattern (left hand drives the left wheels and raises and lowers the loader arms, and the right hand controls right wheels and curls or dumps the bucket) or both.

### Multiple functions

Electro-hydraulic control allows manufacturers to incorporate a number of hydraulic functions into the joysticks' control handles.

For example, the left joystick of John Deere's electro-hydraulic Total Machine Control (TMC) includes a button for the horn; a button to turn hydraulically operated attachments, like an auger or four-in-one bucket, on or off; two auxiliary hydraulic control buttons to shift attachments right or left, to angle them up or down or to raise or lower them; and a trigger to turn the two-speed transmission on or off.

The right joystick has a roller switch to vary the auxiliary hydraulic flow for attachments and a trigger switch to operate the bucket in the float position for fine grading. The system also includes a foot throttle to provide power boost when needed.

The speed management features of Bobcat Selectable Joystick Controls allow you to control travel speed independently of engine speed for optimum attachment performance and more precise control of machine movements in tight areas.

With mechanical controls, pushing forces are transmitted back to the operator through the levers. This helps you adjust throttle settings and loader functions to prevent the engine from stalling when pushing into piles of dirt or lifting loads. Joystick controls lack this feel for the machine. To

compensate for that, joystick controls are designed to automatically adjust hydraulic flows in response to engine speed.

### Less wear and tear

The multiple linkages of mechanical controls systems provide various points of wear. Over time, they can require lubrication and

turers report. "Our electro-hydraulic system is sealed to keep out dirt and moisture," says Zupancic. "And, you can adjust tracking of the machine using the cab's computer monitor."

Steger adds, "If you keep the hydraulic oil clean, hydraulic pilot controls can last the life of the machine. If required, most repairs

**"If you keep the hydraulic oil clean, hydraulic pilot controls can last the life of the machine. If required, most repairs can be made without removing the unit from the machine to save time and money."**

David Steger / Takeuchi

mechanical adjustments to prevent the drive or loader functions from creeping when controls are in neutral or from veering to the right or left when the drive wheels on one side are turning faster than the other.

Joystick control systems require little if any maintenance, manufac-

can be made without removing the unit from the machine to save time and money."

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



Joystick controls on Gehl 4640E compact track loader.

operate a low-pressure hydraulic system that moves valves and spools for directing hydraulic flow to the hydrostatic drive system and to the loader arm, bucket and auxiliary hydraulics," says David Steger, national product manager. "It's simple to operate and requires no periodic adjustment."

Electro-hydraulic pilot controls, like those used with Bobcat and

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Innovative onsite solutions are part of the regulatory scheme in Schuyler County, N.Y. Here, a sand filter system is shown under construction. (Photography by Jennifer Geck)



All systems in New York state are required to provide treatment or dispersal of treated effluent. Proper assessment of the in situ soils is crucial to proper design. This site has about 20 inches of usable material before the hard pan (dense layer of clay and silt) and mottling occurs.

# Protecting the Lakes

The onsite regulatory program in Schuyler County, N.Y., takes an "entrepreneurial," problem-solving approach to effective system management

By Gil Longwell

## Schuyler County, N.Y., Watershed Protection Agency

**YEARS IN EXISTENCE:** 35

**SERVICE AREA:** 326 sq. miles

**EMPLOYEES:** 2 watershed inspectors, 2 part-time support staff

**AFFILIATIONS:** NOWRA, New York State Water Environment Association

**WEB SITE:** [www.schuylercounty.us/wpa](http://www.schuylercounty.us/wpa)



**T**im Hicks, watershed inspector for Schuyler County, N.Y., sees the regulator's role as integral to the onsite wastewater industry. "As an industry, I'd like to see us grow to better serve the public," he says. "We must be part of the solution, not an obstacle, to repairing problem systems where a regulatory fix is impossible."

Hicks, who works as inspector-supervisor in the county's Watershed Protection Agency (WPA), says his personal wish list includes a more entrepreneurial role for the agency in onsite system monitoring. He lists site evaluation, permit issuance, construction and pre-closure inspections, public education, and violation mitigation as traditional roles for regulators.

In Schuyler County, with just over 19,000 year-round residents and about 8,000 onsite systems, the WPA already serves the public in a host

of traditional and nontraditional ways. The WPA functions in a small county whose population balloons in summer as tourists and seasonal residents come to visit area lakes.

The water resources are precious, and therefore onsite systems, especially those on lakefront properties, must be managed effectively. At the same time, Hicks sees a need for the county and his agency to be flexible in finding solutions from problem onsite systems.

### Unique setting

Schuyler is the seventh smallest county in the state of New York by area (329 square miles) and has the second smallest population. It is in two world-class watersheds: the Great Lakes and the Chesapeake Bay.

"There are different water-quality concerns for each," says Hicks. The county also touches the southern end of Seneca Lake, the largest of

**"We must be part of the solution, not an obstacle, to repairing problem systems where a regulatory fix is impossible."**

— Tim Hicks

the five glacier-formed Finger Lakes, and surrounds several smaller lakes. "The small lakes are eutrophic," Hicks observes. "That means they are rich in mineral and organic nutrients that promote a proliferation of plant life, especially algae." That adds a level of concern for water-quality regulators.

Seneca Lake, on the other hand, is oligotrophic, which means it has a low supply of nutrients. Such lake water is considered to be of a higher quality that supports a greater range of plankton, zoobenthos and fish communities. It there-



Jim Howell, assistant watershed inspector with the county Watershed Protection Agency, discusses an existing onsite system with the property owner. Regular routine inspections are now required for many lakefront homes. Strong verbal communication helps county representatives educate the homeowner on why the program is necessary.



fore requires special protection. Everyone who uses the lakes, for purposes from drinking to recreation, from winemaking to manufacturing, must act responsibly to ensure the resources are well managed and protected.

Making life more complicated, the year-round population of 19,000 expands to as many as 1.5 million during the tourist season. Like the roads, restaurants and everything else, the wastewater collection and treatment infrastructure must handle the spike in people.

Outside of seasonal growth, the county has had just a 1-percent growth rate in year-round residents during the early years of the 21st century. Hicks' agency issues about 100 permits for complete onsite system installations each year, of which about 10 are replacements for existing homes. Seventy permits for various component repairs are issued in a typical year as well.

### Fine-tuning the law

New York's Public Health Law is the empowering legislation that enables counties to opt in or opt out of various public health programs. Programs from which counties opt out are left to the New York State

Department of Health to administer.

"Using the authority Appendix 75A of the Public Health Law, Schuyler County has opted into the onsite program and has taken that program several steps beyond the state-envisioned base level of service," Hicks says. He points out that his predecessor and current colleague, Jim Howell, started the WPA on its entrepreneurial path.

The county offers all onsite system permit applicants access to an in-house design service. "There is, however, no obligation to use the WPA's designer," Hicks says. Landowners who choose the service can have the WPA's contracted engineer prepare a system design using site-specific soil information that Hicks or Howell acquire at the site-evaluation stage. "This service is cost-competitive with other counties that offer the same service," Hicks says.

Recognizing the unique topography, soils and characteristics of the area, the county in 1973 adopted a watershed law that formally transferred all wastewater-related administration and enforcement from the state to the county health department. The WPA is a component of that department.

The law was amended in 1993, and those amendments created a new right for purchasers of property served by onsite systems. "If the buyer or mortgage lender chooses, they can request a WPA inspection of the onsite system," Hicks says. "The seller cannot refuse the inspection." The WPA is the only recognized inspection agency. Hicks estimates that half of eligible real estate transactions are run through the inspection process, a fee-supported service.

Three towns in the county front on lakes even more fragile than Seneca, and each has lakefront properties served by onsite systems. All these towns require periodic inspections for all systems and have delegated enforcement to the WPA.

In addition to Hicks and Howell, the WPA has two part-time administrative support employees, Mary Kelly and Lois Hubbel. As a team they also address water well issues and respond to a variety of inquiries from the public.

### Creative problem-solving

A few examples illustrate how the

The Watershed Protection Agency is beginning the task of digitizing the county's onsite system records. They will then be referenced spatially and integrated into the county GIS. Tim Hicks, inspector-supervisor with the agency, shows the technology to a property owner.



## Institutional Memory

For more than 30 years, Jim Howell, now assistant watershed inspector, had Tim Hicks' job as head of the Schuyler County Watershed Protection Agency. "Jim is the reason the WPA has pursued the entrepreneurial role so effectively," says Hicks.

Long before the State University of New York at Delhi started training onsite system inspectors, Howell was inspecting systems in fulfillment of the county's 1993 Watershed Law Amendments. In 1993, very little was written about inspections, management, monitoring or maintenance,

so Howell relied on what he had to get the program going: experience.

"Jim and I have learned a great deal about systems from a variety of sources, and we have incorporated much of what we learned into the inspection protocol we use," notes Hicks. Active in a variety of professional organizations, including NOWRA, Hicks and Howell rub elbows with all sectors of the onsite industry.

Hicks says his entrepreneurial vision is "built upon the sound foundation of value-added services Jim Howell has introduced to the community through the WPA."

WPA approaches unique problems with no ready-made regulatory solutions.

Hicks is now working with a commercial distiller to find a solution for the onsite treatment and management of nonsewage wastewater. As an interim measure, the operation will be served by holding tanks.

Because no local treatment plant accepts this type of waste, the distance to the treatment plant is too great to make a holding tank a permanent strategy. State wastewater regulations do not address onsite disposal of such material, so Hicks and the developer's engineer are seeking ways to treat the wastewater adequately and then return it to the environment through the soil.

Lakefront residential properties bring different challenges. "Most lake properties have allocated the entire useful surface area of the property,"

Hicks says. "If it is not paved, decked, under a house or too close to a well or the waterline, it is often occupied by the onsite system."

He offers two examples where his office helped define and implement suitable solutions.

The management program at Waneta Lake identified an absorption area that was overwhelmed and discharging to the surface. With no unused land available, the only spot to consider was at the site of the failed absorption area. An in situ repair was proposed.

"The solution we permitted required the excavation of the existing aggregate absorption area and the placement of a suitable sandy loam material," Hicks says. "We installed Geotextile Sand Filter (GSF) from Eljen Corporation and placed a sandy loam backfill to cover those units. The entire instal-

lation was covered with topsoil to support grass, and a SludgeHammer microbial inoculator was retrofitted into the treatment tank."

In limited space, the work met WPA's goal of close-as-possible regulatory compliance and the landowner's goal of a functioning system.

### Providing counsel

On a different lake, a buyer asked for an inspection when he bought his property. The system serving the four-bedroom house

opted to reduce water use and balance her use of the two systems. "In these situations, it would be nice to see regulatory-compliant systems installed," Hicks says. "However, in the absence of a violation, there is no basis to compel this or any other repair strategy — at this time," says Hicks.

### Part of the industry

Hicks sees the onsite industry as similar in important ways to the transportation industry. "The New

In these situations, the Department of Health's regional office becomes involved in a waiver process.

The waiver is a kind of release from the strict application of Appendix 75A requirements. "These repair sites allow the landowner and the onsite industry to test-drive a technology that might not otherwise be seen in the county," Hicks says. This collaborative approach is an example of what Hicks means by being "part of the solution."

Where terrain and distance rule out big-pipe solutions, onsite system management is a timely and cost-effective alternative. WPA's management program in three municipalities includes fixed-interval pump-out and inspection of all onsite systems. Hicks recognizes the advantages of consolidated data management and interpretation, and he sees it as a growth opportunity and a good fit for WPA's resources. A centralized information repository will be an asset to municipal and county government, the real estate community, the service sector of the onsite industry, and the public, he believes.

The 1993 Watershed Law amendments required the WPA to establish an inspection protocol for existing systems. Hicks and Howell have completed an onsite inspector-training program and have become certified inspectors. This training and the certification program were developed by the State University of New York at Delhi (SUNY Delhi). "Over the years WPA's inspection

protocol has been refined to include the lessons we've learned," Hicks says.

### Blended roles

Hicks and the county government have augmented the traditional permit-related regulator role with a new program that manages existing systems, and they have created an expanded menu of optional services to the public. An inspection service for homebuyers and lenders has found problem systems, which are then repaired. One outcome is the confidence buyers have in the onsite system they will depend on.

Hicks pursued the job because "I felt it offered variety and opportunities for growth." As the WPA's service menu grows, so does Hicks' involvement with the public and with the onsite industry. The WPA has blended into the community and the onsite industry, and Hicks believes both are better for it.

There will always be an explicit regulatory role for the agency and, if Hicks' vision comes to fruition, there will be an equally well-defined entrepreneurial role for the agency as a part of the industry. ■

## "I see the regulator as an integral member in the onsite industry."

— Tim Hicks

consisted of a 500-gallon metal tank discharging to a seepage pit. It was not a regulatory-compliant system, nor was it in violation. The distance to the waterline was 30 feet, and the vertical distance to groundwater was two feet. Hicks could force no remediation action.

Not long after, the same person bought the adjacent property, and an inspection there found similar conditions, but no violation. Hicks counseled the landowner, who recognized the need to protect the lake, which was the source of drinking water for the properties. The owner decided to install a community system to serve both homes.

A two-compartment tank was installed for each house. The effluent was directed to an aerobic treatment unit, and from there, up slope to the backs of the properties, where there was room for an absorption bed. The area was excavated to 40 inches to remove any soil compacted by cars being parked on the area. Gravelless chambers were installed and an aggregate backfill was placed. Topsoil was then placed.

Another house off the water had two separate systems serving different portions of the flow. Both had undersized tanks. When the tanks were pumped for the first time in anyone's memory (at least 40 years), both experienced run-back. Neither was in violation.

The occupant, an elderly woman, wanted a consolidated replacement system. After getting prices to do the installation, she chose not to install the system. Instead, she

York Department of Transportation (DOT) is part of the transportation industry," he says. "It is an infrastructure provider. Its job is to establish the infrastructure that enables users to get from A to B. It also sets minimum maintenance standards for all other county DOTs."

The New York Department of Health and Hicks' agency have similar roles in the onsite industry. The health department created the regulatory infrastructure that enables a vacant site to be developed and occupied, with an onsite system for wastewater treatment. "This infrastructure starts with the prescriptive regulations on soil depth, percolation rate, slope restrictions, system types and more," Hicks says.

"DOT knows it cannot, nor should it, make every road an interstate," he notes. "The Department of Health, Schuyler County and its municipalities know that not all homes will be served by municipal sewage collection and treatment. We will always have and rely upon onsite systems, and since 1993 this county has been helping landowners manage them."

The management program identifies systems that must be replaced, but Hicks observes, "There is not always a regulatory solution to the problem. Abandoning the property is not an option, so other solutions must be found."

These sites present opportunities for Hicks, the designer, technology manufacturers and the installer communities to bring new and innovative technologies to the county.

**Replacement systems often require innovative design components. This replacement system, serving two cottages totaling four bedrooms, consists of a 1,500-gallon dual-compartment septic tank, a 500-gallon pump tank, and a shallow absorption bed system using a prefabricated gravelless system, manufactured by Eljen Corp.**



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The Hoot-ANR is just one of a series of three treatment systems by Hoot that perform <10 CBOD<sub>5</sub> & <10 TSS at the lab and in the field. Additionally, Hoot offers two Nitrogen Reduction Technol-

ogies; one utilizing timed recirculation and another that achieves the maximum Nitrogen Reduction, for the most sensitive environments, that reduces Total Nitrogen as far as possible (5.8 mg/L under the Standard 245).

The Hoot-ANR utilizes a "patent pending" process that adds a food grade additive to provide additional carbon necessary to off gas as much Nitrogen as possible. This process is controlled by a controller, not homeowners.

By monitoring flow through the system, it ensures flow proportional dosing to provide reliable performance. Additional set points can be selected by the maintenance provider for a range of influent from of 35 to 75 mg/L TN.

Some recently advertised studies, NOT certifications, have allowed for system performance to be ignored for the first 16 weeks of the study. The NSF Standard 245 allows a maximum of only a 3 week startup. At the end of week 4, the Hoot-ANR achieved a 92% reduction. (2.7 mg/L TN)

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Protect Tomorrow's Environment.**

# Even Distribution

Low-pressure drainfields are a valuable soil-treatment alternative. Such systems require special maintenance practices to ensure that they remain effective

By Kit Rosefield

**L**ow-pressure drainfields are an excellent treatment option in many onsite applications. A key advantage of low-pressure systems is even distribution of pretreated effluent over the media surface.

Whether a media-filled trench, chamber system, shallow narrow drainfield or other type of soil absorption system, low-pressure application of pretreated septic tank effluent promotes even biomat development and helps ensure good final treatment and dispersal into the natural soil treatment environment.

In addition, the upward spray of effluent through a network of orifices into orifice shields provides "impact flow," wherein oxygen transfer is promoted, enhancing the aerobic treatment capabilities of the soil. Designers specify the orifice sizing and spacing depending on the application rate established during the site and soils evaluation. If you provide maintenance for onsite systems, you will surely encounter low-pressure systems. It is essential to understand how to maintain these systems properly.

## Knowing the basics

One common question is: Why are these drainfields called low-pressure? The answer is that these systems are pressurized using a pump, and most operate at 1.3- to 3.5-psi water pressure.

In the field, the pressure is typically measured in foot head of

distal pressure (each foot head equals .43 psi). The measurement is normally taken at the end of a drainline lateral, either by a static test in clear plastic tubes or as a dynamic test where a column of water is sprayed upward through a 1/8-inch orifice drilled in a drainline lateral end test cap. This test is known as a squirt test.

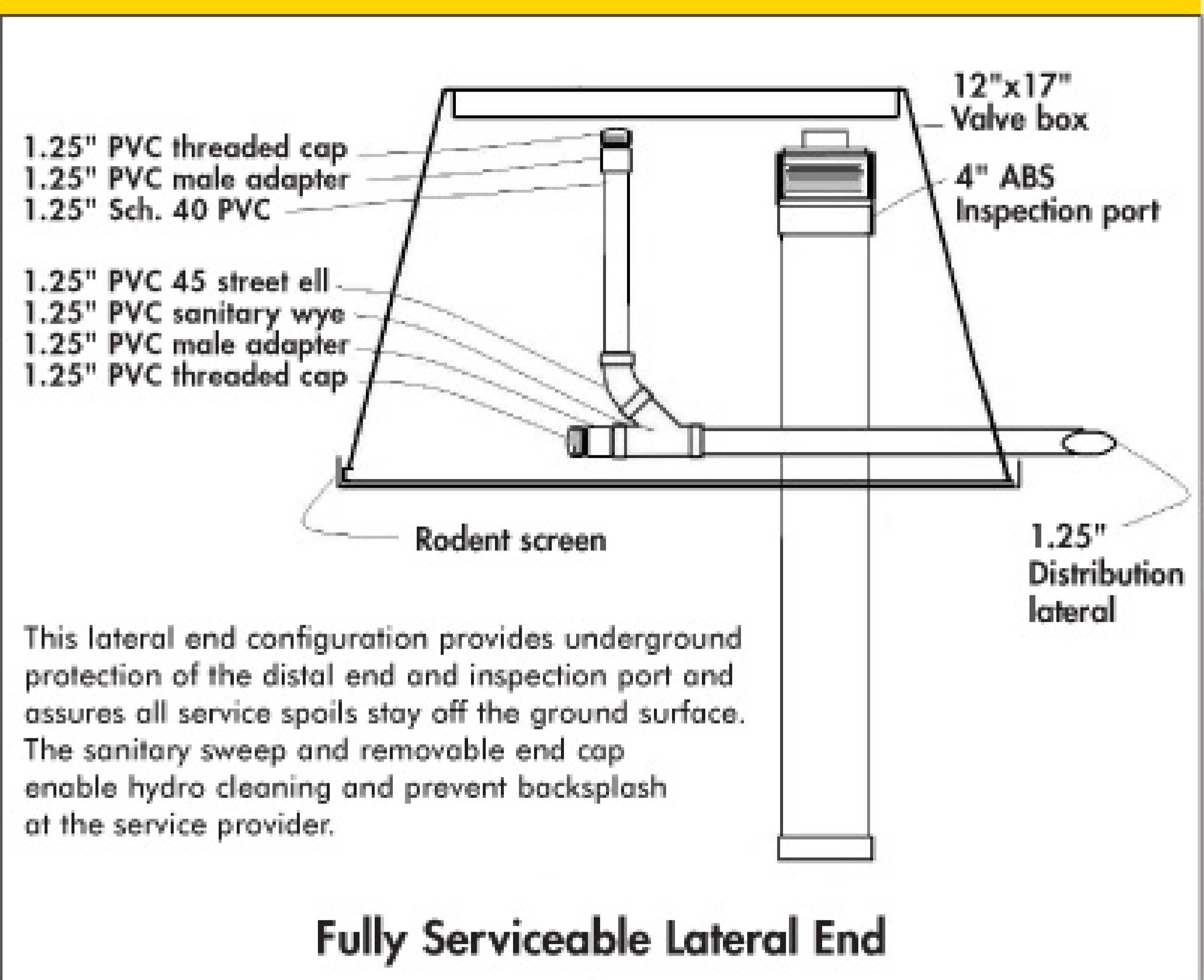
The application of low-pressure or other pressurized options, such as drip dispersal, is even more important when advanced treatment is employed, as highly treated effluent is very slow in promoting biomat development.

Biomat development is critical to achieving even distribution in the bottoms of the trenches. Advanced treated effluent, when applied to a gravity drainfield, moves quickly downward without the benefit of a biomat and forms a saturated area where, as we have learned, aerobic bacteria cannot survive, thus providing little or no final soil treatment.

## System options

There are two commonly specified low-pressure drainfield options: low-pressure pipe (LPP) and shallow narrow drainfields.

Low-pressure pipe systems may have different media options specified. Rock trenches are fairly standard, while sand trench systems are sometimes specified to provide additional in-trench advanced treatment. In either case, orifice shields should be used to



protect the orifices from plugging and provide impact flow and oxygen transfer. Many chamber installations employ low-pressure distribution suspended in the chamber housing. (Always refer to design or manufacturer's recommendations.)

Shallow narrow drainfields are an option in which a larger orifice shield, typically a half-round of 12-inch-diameter PVC, is installed over a shallow, flat-bottom trench with minimal covering soil to promote good oxygen transfer. Actual trench depths, shields and cover soil depths are specified by the system designer.

There are also numerous dosing options for low-pressure distribution systems. The designer may

specify locally controlled demand dosing or socially controlled timed dosing. A switching valve may be used to enable rotation of the distributions through multiple laterals or zones, allowing resting between applications or seasons. There are numerous types of switching valves, including manual isolation, manual three-way and automated options such as hydraulic sequencing, electronic servo and electric solenoid.

## Doing maintenance

Whatever the option, the maintenance requirements of low-pressure systems are all very similar. While the frequency of maintenance may be determined by local regulations, or may be based on

effluent quality, a rule of thumb is once per year.

Before performing any service, it is necessary to walk the drainfield and perimeter area to ensure that there are no existing problems, such as selective fertility, surfacing effluent, saturated areas or erosion. The next step is to measure and record liquid levels in the inspection ports, if present.

These activities are important because the actual servicing will add water to the drainfield area and thus exacerbate pre-existing problems. If you note problems, you will have to postpone service and recommend remediation.

Having documented that there are no problems, the next step is to set up for service. Turn off the pump basin controls and lock and tag the panel breakers. Open up all service points: the discharge pump tank cover, switching valve enclosure, distribution valve access boxes, and lateral end service access boxes.

Inspect and verify the function of the switching valve and service it as necessary according to the manufacturer's recommendations. Depending on the capacity of the discharge pump tank, you may need to begin adding water at this point. Place squirt caps or clear plastic riser tubes on the lateral end service risers.

With all squirt caps or clear plastic risers in place, and with adequate water in the tank, turn the discharge pump HOA switch to AUTO position. (There is a risk of running the pump in MANUAL position, as pumping too low may draw unwanted solids into the pump intake.)

Measure and record the height of the column of water rising from each lateral end. Next, remove the squirt cap or clear riser tube from all lateral ends. Isolate each lateral by closing down the lateral distribution control valve and noting its position. This will help in rebalancing the system after cleaning.

After noting that there is adequate water in the discharge tank, open one lateral at a time and turn the pump to AUTO, thus flushing water at high velocity through the isolated lateral. Watch the lateral

end as accumulated biosolids are evacuated and water begins to run clear. Repeat the procedure for each lateral.

Take care that no effluent is allowed to contaminate the ground surface. Proper configuration of lat-

**Whether a media-filled trench, chamber system, shallow narrow drainfield or other type of soil absorption system, low-pressure application of pretreated septic tank effluent promotes even biomat development and helps ensure good final treatment and dispersal into the natural soil treatment environment.**

eral ends is critical here. (See the accompanying drawing.) Neglected systems may require brushing or hydrojetting. If so, additional flushing must be done after this process.

With all laterals flushed and cleaned, reposition the squirt caps or clear riser tubes on the lateral ends and return the distribution valve to the position noted before isolating. Making sure again that there is adequate water in the discharge tank, turn the pump again to AUTO, and make fine adjustments to each lateral distribution valve to achieve even heights, thus even effluent distribution.

You can now stop adding water to the discharge tank. Remove the squirt caps or clear risers, replace the lateral end caps, and secure the access covers on the lateral end, distribution valve and switching valve enclosures. Turn the pump control breakers on and the HOA switch to AUTO, and verify that the liquid level pumps down normally. Replace and secure the pump tank cover. Walk the drainfield and perimeter area again and verify that there are no problems.

#### Quick checklist

Here is a quick recap of the critical issues in operation and maintenance of low-pressure distribution systems:

1. Verify that all service points are accessible and intact.
2. Verify that there are no pre-existing problems in or around the drainfield.
3. Turn off the control breakers and

switches, and lock and tag the panel.

4. Set up the drainfield for and conduct a presquirt distal head pressure test, and record the results.

5. Isolate the lateral distribution control valves, noting their original position.

6. Flush the laterals one at a time to achieve maximum scouring velocity.

7. Brush or hydroclean the laterals if necessary, and flush again.

8. Rebalance the laterals to ensure even distribution.

9. Secure all lateral ends and enclosures.

10. Return the controls to their normal operating positions and verify normal pump-down.

11. Inspect the drainfield and perimeter area, noting any problems.

To learn more about operation and maintenance for low-pressure drainfields and all system components, check the events calendars at the Web sites of the National Association of Wastewater Transporters ([www.nawt.org](http://www.nawt.org)) or the Consortium of Institutes for Decentralized Wastewater Treatment ([www.onsiteconsortium.org](http://www.onsiteconsortium.org)) for the next Consortium O&M Service Provider training program.

*Kit Rosefield is an onsite treatment system service provider serving northern California and based in Mi Wuk Village, CA. He can be reached at [kit@septicguy.com](mailto:kit@septicguy.com). ■*

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# Out of Order

A conventional installation for a large estate becomes complicated when building contractors fail to let the onsite system be built first

By **Scottie Dayton**

**C**ontractors building a 27,000-square-foot estate on Indian Creek Golf Club Island in Indian Creek, Fla., didn't know the onsite system should be one of the first components installed, not the last. When Jason Nesenman of Jason's Septic Inc. in Miami arrived to start work, the estate was three-fourths completed.

Although the system's design was elementary, it was the largest Nesenman had installed to date. He and his five men faced tides, shifting sands, limited access, congestion, a bridge with weight restrictions, and damage to the system that stretched a normal two-week job into a month-long adventure.

## Site conditions

Soils were 100 percent sand with no absorption rate, and the water table was 7 feet below grade.

The 0.4-square-mile island is in Biscayne Bay, across from Miami Beach. The lot, developed to its limit, is 400 feet long with 500 feet of oceanfront.

## System components

Based on 24 bedrooms, engineers at Doug Winters Companies Inc. in West Palm Beach, Fla., designed the wastewater system to handle 2,800 gpd. Its major components are:

- 5,000-gallon cylindrical lift station with two 1-hp Barnes pumps from Southern Pump, West Palm Beach, Fla.
- 2,500-gallon primary septic tank. All tanks from Sebring Septic, Sebring, Fla.
- 1,250-gallon secondary septic tank with two A600 effluent filters from Polylok Inc., Wallingford, Conn.



- 2,500-gallon pump tank with two 1-hp Barnes pumps.
- 1,000 feet of 1-inch Schedule 40 PVC low-pressure pipe.
- Two Hydrotek 6603 multi-zone distribution valves from Quanics Inc., Crestwood, Ky.
- Control panel from SJE Rhombus Controls, Detroit Lakes, Minn.

Three tanks were installed in a series: a 2,500-gallon primary tank, a 1,250-gallon secondary tank, and a 2,500-gallon pump tank. All the tanks have manholes and traffic lids. (Photos courtesy Jason's Septic Inc.)

## Laundry system components

- 1,500-gallon septic tank with A600 effluent filter.
- 200 feet of 1-inch Schedule 40 PVC pipe.

## System Profile

<b>Location:</b>	Indian Creek Golf Club Island, Indian Creek, Fla.
<b>Facility served:</b>	24-bedroom mansion
<b>Designer:</b>	Doug Winters Companies Inc. in West Palm Beach, Fla.
<b>Installer:</b>	Jason's Septic Inc., Miami, Fla.
<b>Site conditions:</b>	Pure sand with no absorption rate; water table 7 feet below grade
<b>Type of system:</b>	Conventional rock and sand drainfield
<b>Hydraulic capacity:</b>	2,800 gpd

## System operation

A 6-inch gravity sewer sends wastewater into the 6-foot-diameter, 12 1/2-foot-tall lift station. Pumps elevate the sewage 12.5 feet to the primary septic tank, from which it flows into the secondary tank and pump tank. Activating 4.5 times per day, alternating pumps in the pump tank push 302 gallons through 2-inch Schedule 40 force mains in 42 seconds. Hydrostatic valves determine which of two 1,500-square-foot drainfields receive the dose. Separated by 10 feet, each bed has 11 laterals.

Laundry water flows by gravity into the septic tank, then to five

We'd make a pile, then haul it away or move it whenever someone wanted to do something."

The drainfields were 6 feet above grade. After removing the native sand, Nesenman put 12 inches of prewashed No. 4 ballast rock on top of 42 inches of silica sand. The men drilled 1/4-inch holes every 9 feet in the low-pressure pipe, then sleeved it in 4-inch perforated pipe.

They used the backhoe to cover the pipes with 4 inches of gravel, then topped it with 3-mil fabric-fiberglass mesh and backfilled with 8 inches of native sand. Golf course grass planted on the drainfields will

**"One contractor building the seawall was pulling out fill and bringing it back in. Three backhoes were in constant operation. One was mine. We'd make a pile, then haul it away or move it whenever someone wanted to do something."**

Jason Nesenman

laterals in the 12- by 41-foot drainfield. All laterals are 38 feet long, on 3-foot centers, and sleeved in 4-inch Schedule 40 PVC perforated pipe.

## Installation

Before Nesenman arrived, the building contractor hauled in 200 truckloads of fill to raise the elevation for the house. "He didn't realize that I had to haul it all out and bring in 20 truckloads of silica sand for the drainfields," says Nesenman.

The bridge from Miami Beach to Indian Creek Island was structurally sound but had a 20-ton limit. Nesenman's tandem-axle dump trucks weighed 35 tons fully loaded. The Department of Transportation said he could carry only half loads. "That doubled my trips, and heavy earthmoving equipment couldn't cross the bridge either," he says.

The men used a mini-backhoe and shovels to excavate the native sand from the drainfield sites. The problem was where to stockpile the sand and fill. "They were starting to landscape and plant mature palm trees," says Nesenman. "One contractor building the seawall was pulling out fill and bringing it back in. Three backhoes were in constant operation. One was mine.

aid evapotranspiration and prevent heavy rain from washing away the sand. The men repeated the process for the laundry drainfield.

About 2 feet of seawater rushed in as they excavated holes for the tanks. "My pump truck couldn't keep up, so I rented a 4-hp pump and shifted the water to the other side of the building," says Nesenman. "As fast as we pumped it out, it came back in."

Working late at night when the tide was low provided the solution. But then the walls of the holes kept collapsing. It also was difficult to spot the installed storm drains before hitting them. A normal 12- by 6-foot pit became a 20- by 30-foot excavation. "As we sloped back, we exposed the bases of the columns and pillars holding up the mansion," says Nesenman.

In one night, the men set the two-piece concrete septic tanks using two 10-ton cranes, one to lift the halves off the ground, and one to pull them upright in the hole. Each section weighed 16,000 pounds. The Category 4 single-compartment tanks have 6-inch-thick walls and traffic-bearing lids to compensate for the walkway and tennis courts above them. Risers



**Above: Two 1,575-square-foot conventional gravel-bed drainfields with 1-inch PVC Schedule 40 low-pressure distribution design. Crews brought in 20 loads of silica sand, but because of the bridge limit, it took 40 half-truck loads. Upper right: A new lift station was installed to move wastewater from inside the house to the primary tank. Lower right: Flooded excavation at high tide.**



were installed flush with the ground and covered with a hatch.

Nesenman fought two nights to install the pump tank. "Everything kept collapsing," he says. "I was ready to get a trench box the next morning, but suddenly the tank went right in. Connecting the 6-inch piping took an hour." The tanks were backfilled with native sand. Nesenman then waited two weeks for the lift station to be manufactured.

Meanwhile, the contractor building a barrier wall around the system received the wrong digging coordinates and hit a distribution pipe in the drainfield, the pressure pump and associated piping. "We replaced those components, but it was a pain ensuring that no sand entered them," says Nesenman.

## Maintenance

Jason's Septic holds the two-year maintenance contract. "Those 24 bedrooms mean lots of parties with extra toilet paper, so I figure the effluent filters will clog every six months," says Nesenman. "Maintaining them will provide the opportunity to inspect the pump floats, the only moving parts on this system."

The design engineers stated

that backflushing wasn't necessary and made no provisions for backflow prevention. Nesenman's inspection will scrutinize these areas and make sure water isn't infiltrating and saturating the drainfields. ■

### MORE INFO:

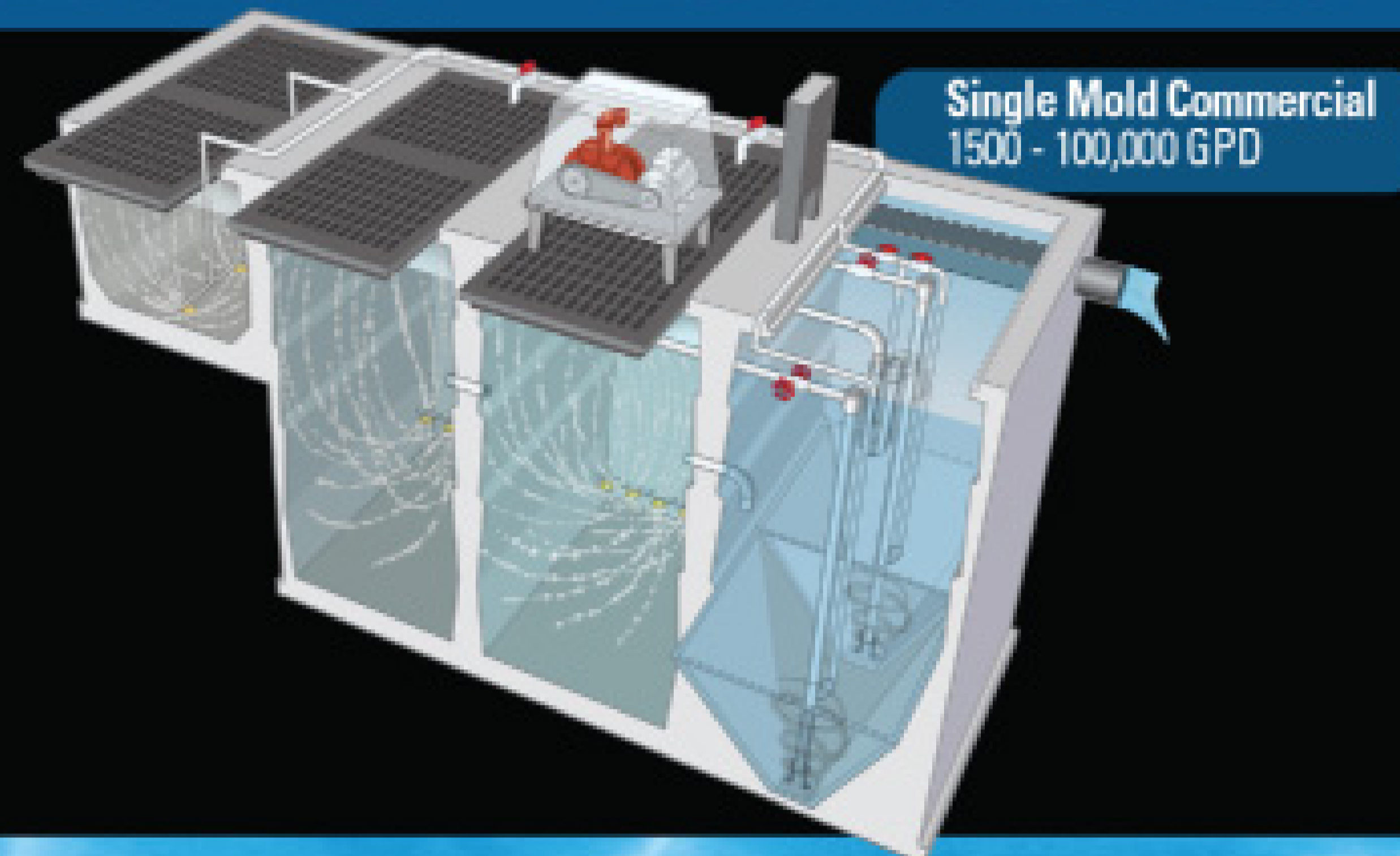
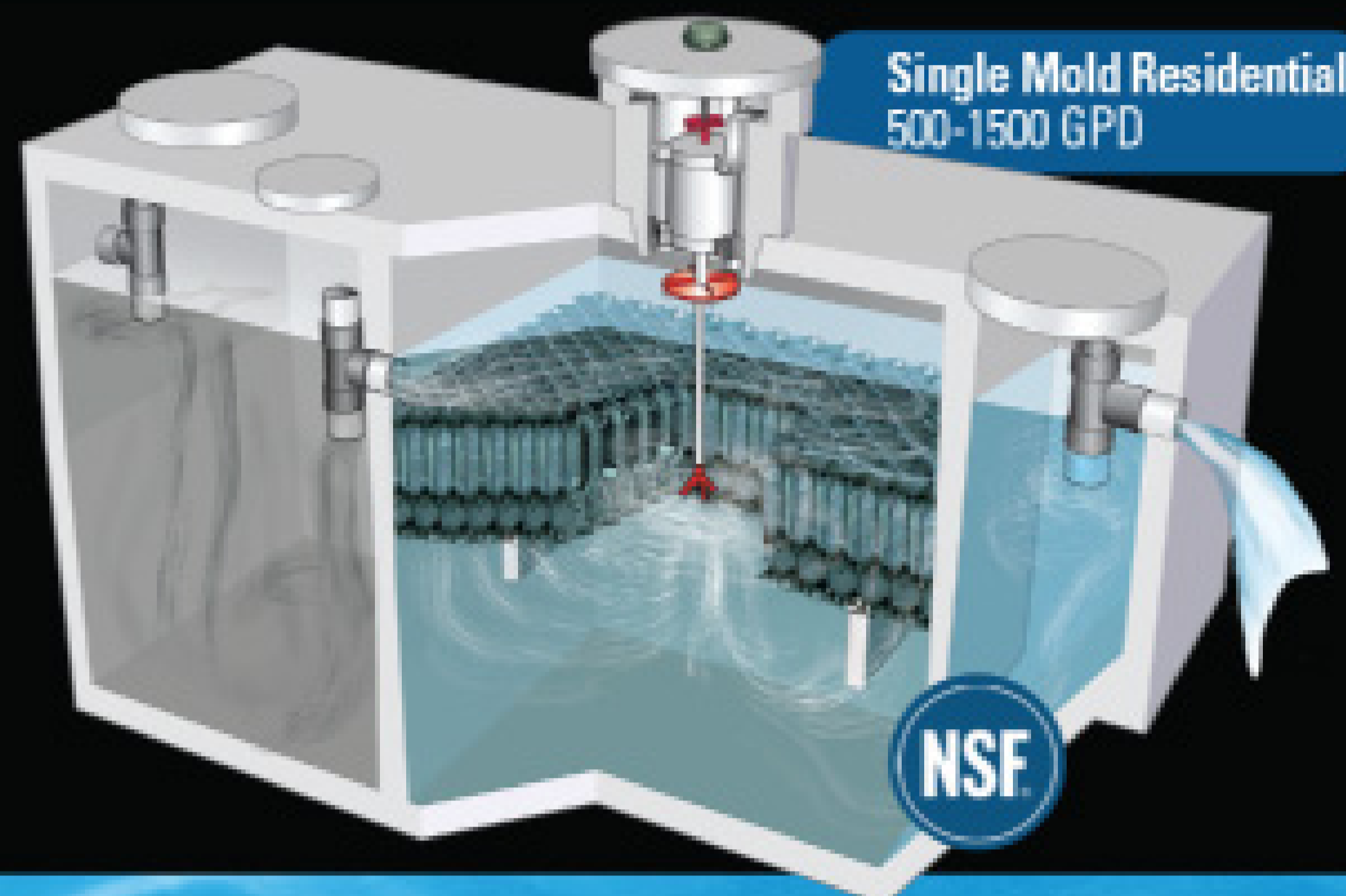
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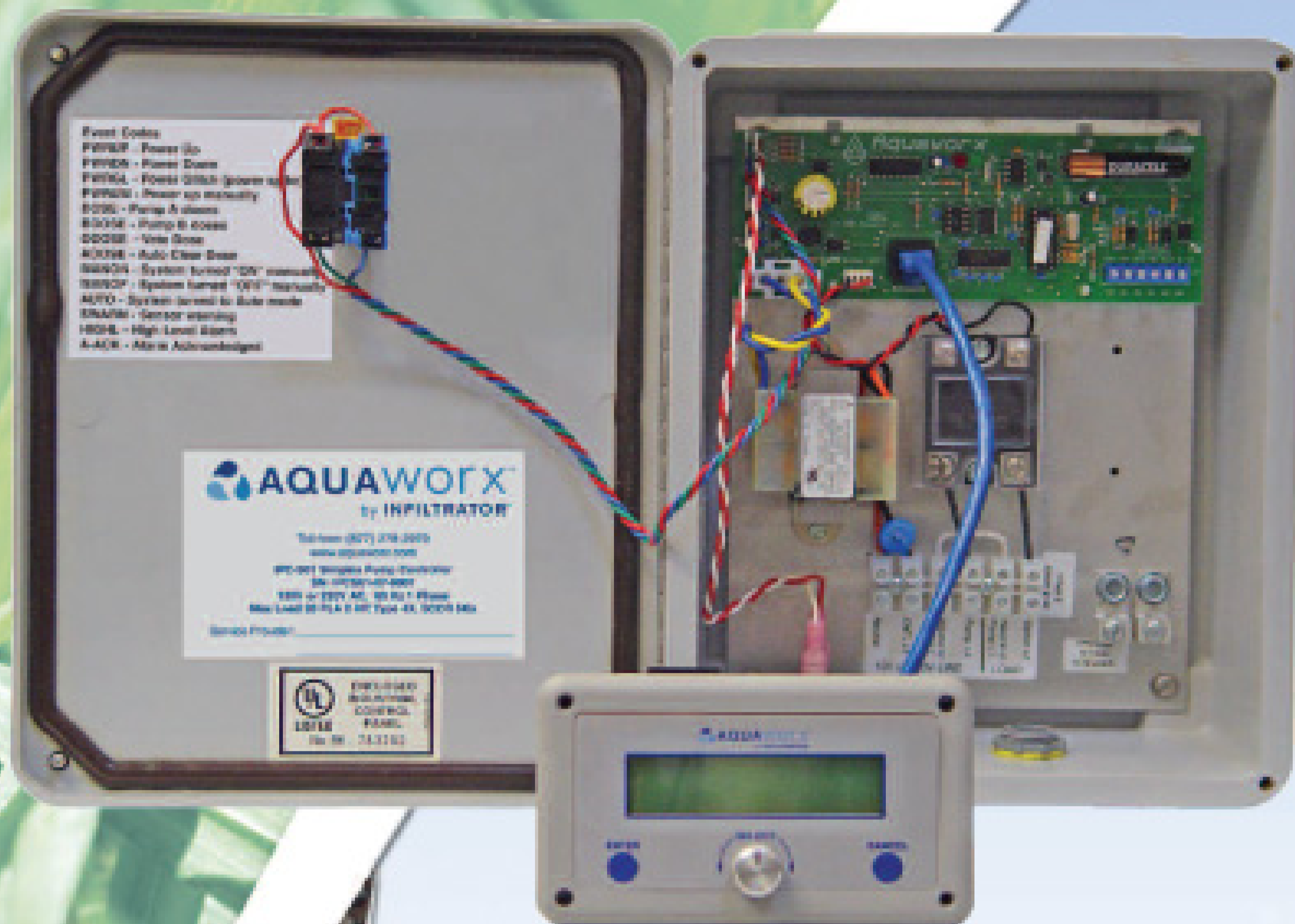
Infiltrator Systems Inc. has launched its updated Web site, with an emphasis on wastewater treatment. The site ([www.infiltratorsystems.com](http://www.infiltratorsystems.com)) includes information on product lines, downloadable performance data, case studies, owner's manuals and product catalogs. ■

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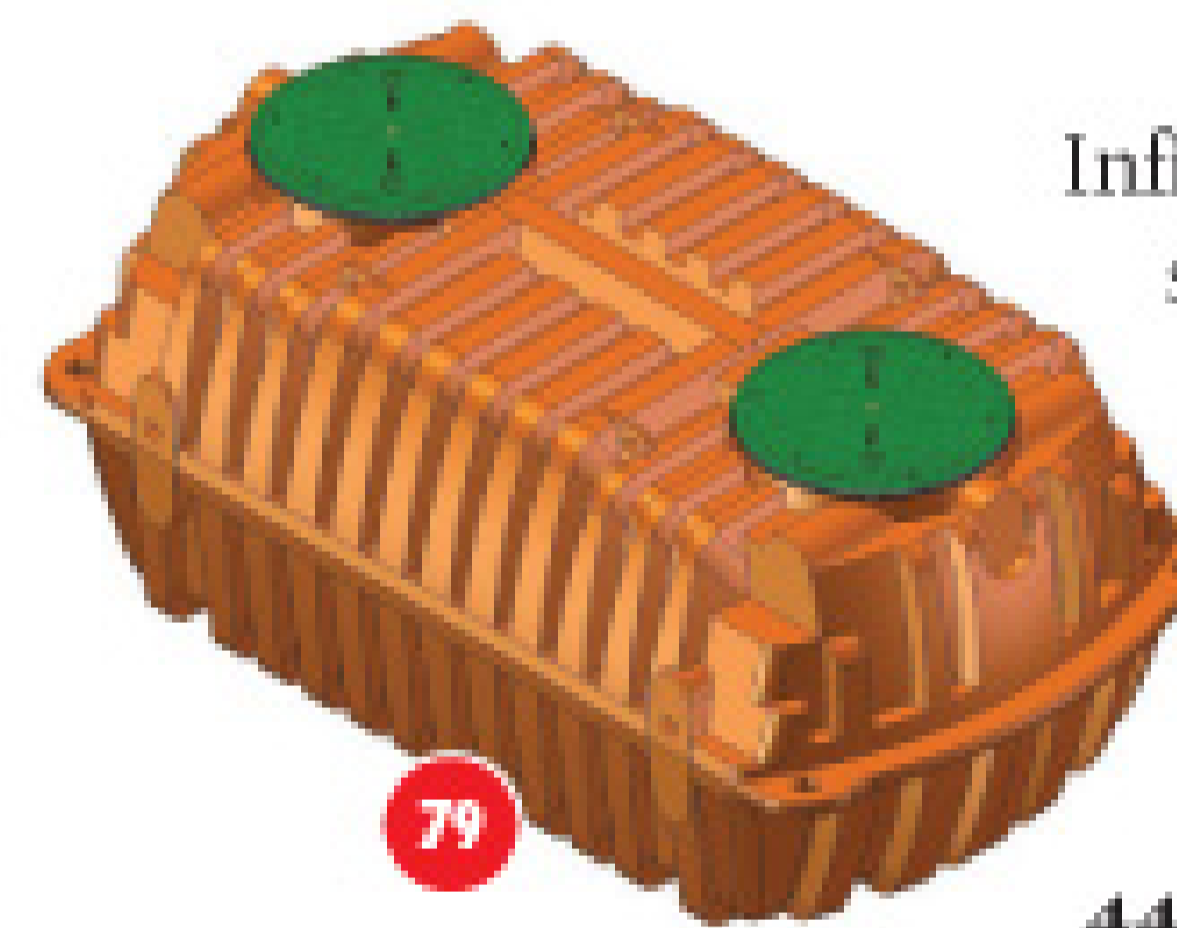
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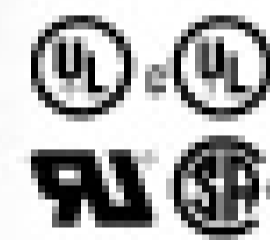
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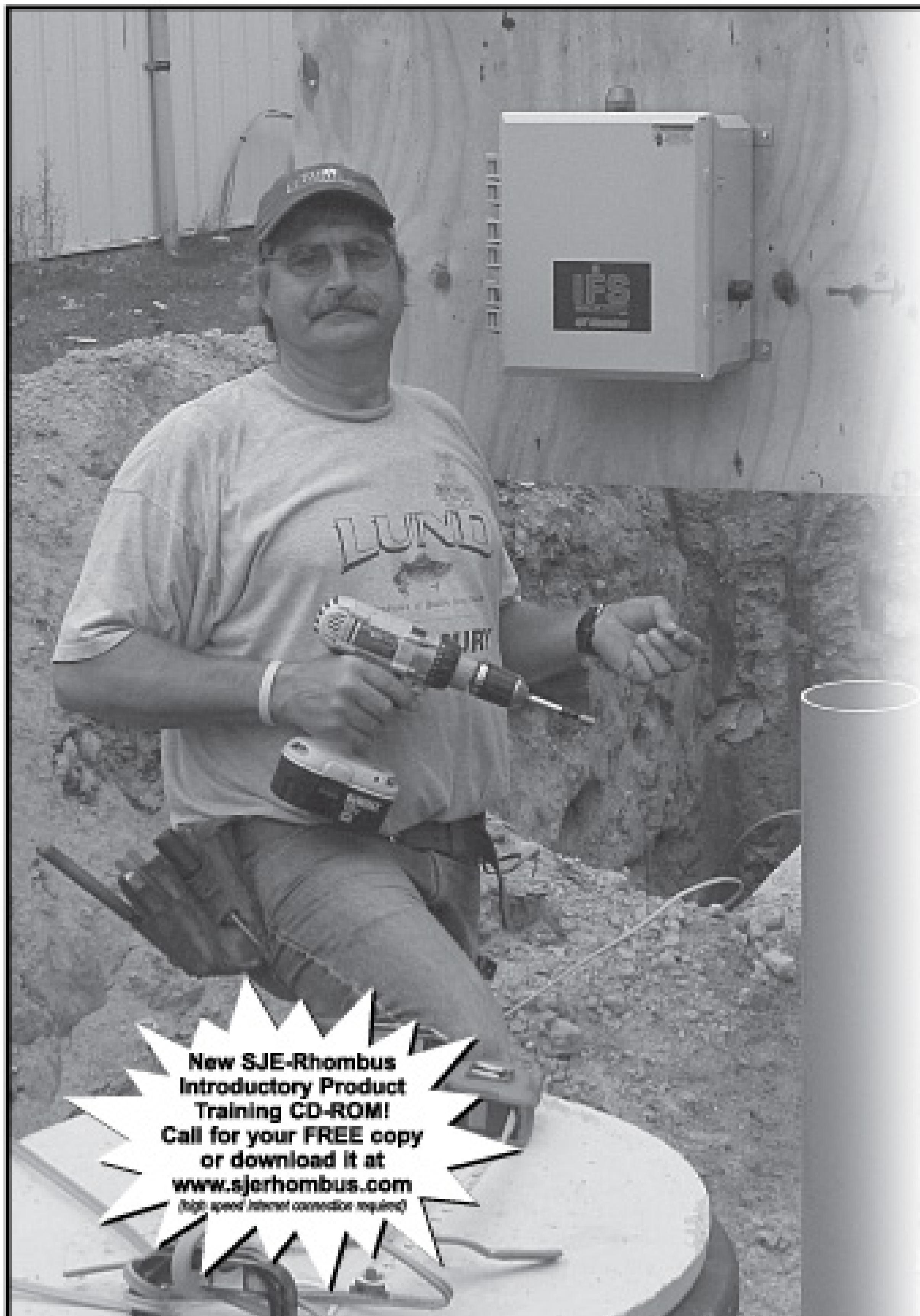
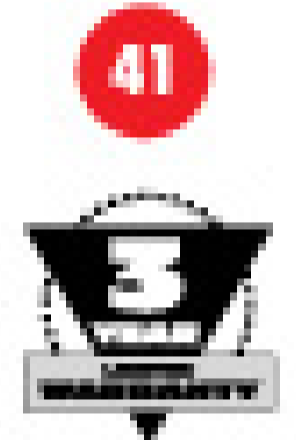


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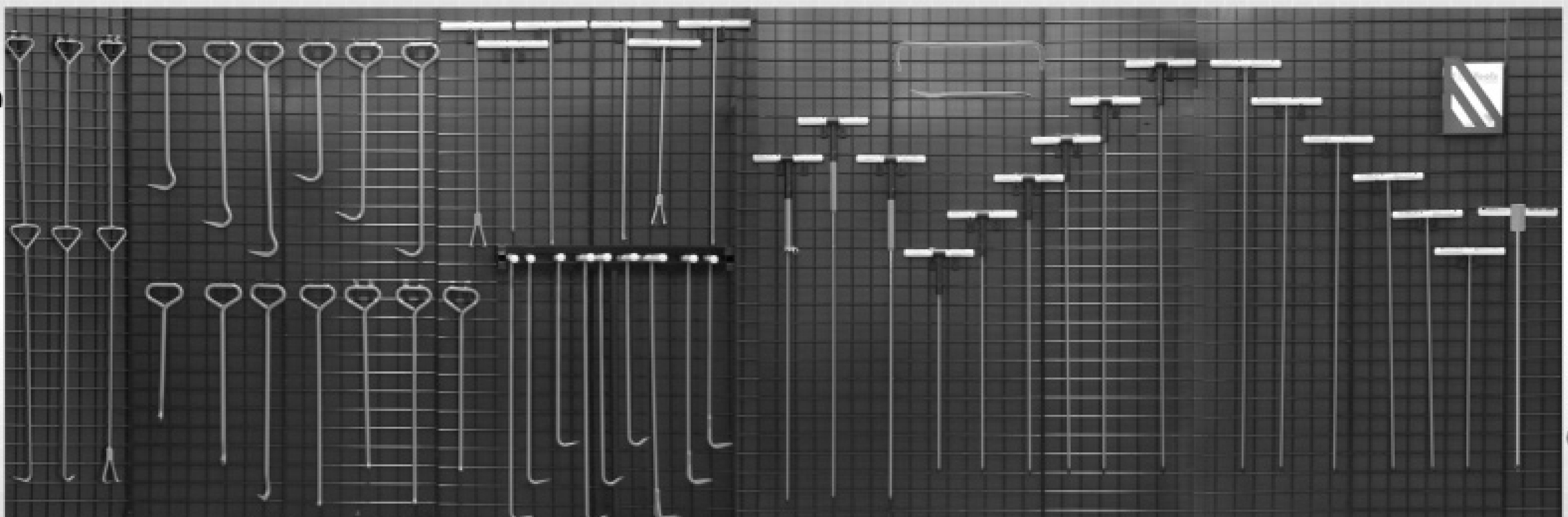


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- > A "slide" allows the handle to pound the shaft into the ground

24

# MARKETPLACE advertising

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E-mail: brenlin@frontier.net

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September

2008

# ONSITE installer™ classifieds

## AERATORS

Septic Solutions, Inc. We sell linear and rotary vane air pumps, rebuild kits and repair parts. Gast, HiBlow, Secoh, Alita and more! Check out our online store full of septic products at [www.septicsolutions.net](http://www.septicsolutions.net) or 1-877-925-5132. (IM)

We sell Flagg-Air 340, Secoh, Gast and Medo Linear, FPZ and Gast Regenerative, Thomas and Gast Rotary Vane aerators, rebuild kits and alarms at wholesale prices. Septic Services, Inc. [www.septicserv.com](http://www.septicserv.com). 1-800-536-5564. (IM)

## BUCKET MACHINES

Bucket Rig: 1998 Chevy 2-axle propane w/5 spd. 1974 Calweld 150, 42" ringgear, 43' depth. \$60,000. 916-991-7809, 916-217-2046. Located in Sacramento, Ca. (PI8)

## BUSINESSES

2-Septic tank delivery trucks; 1-ready mix truck; 7-Celico septic tank forms (1000-1500 gallon); misc. drop box, riser forms, lift tank forms. Trucks and loaders in good condition. (In service in 2007) All forms in good or better condition. (Used in 2007) Package price \$70,000. 218-829-9678 or 800-829-5755. (I8)

FOR SALE: Sunny South Florida. Full service septic tank business established 20 years. Great potential; great records. Owner retiring. Call Chris 305-297-2171. (PI12)

FOR SALE: Established company in Florida specializing in the following services: onsite septic installation service & repair, septic pumping & cleaning, portable chemical toilet service. Turnkey operation! Equipment, trucks, accounts. Serious inquiries only. Call TLS 1-352-428-5939. (PBM)

## BLOWERS

We sell Roots & Sutorbilt Rotary Lobe blowers. We also sell linears, regenerative, rotary vane aerators and alarm kits. Septic Services, Inc. [www.septicserv.com](http://www.septicserv.com). 1-800-536-5564. (IM)

## DEWATERING

2000 Flo Trend 12-yd. box mounted on 5th wheel trailer with 100 gallon liquid polymer injection system. Also Honda 3" trash pump. Top totally enclosed with 3 hatches. \$15,000. 803-385-8681. (I6)

## DRAINFIELD RESTORATION

1997 Terralift with trailer, excellent condition. \$12,000. 253-405-0708. (P9)

## HAND TOOLS

**Crust Busters** - Portable, lightweight machine guaranteed to mix up septic tanks and grease traps! Save time and money! [www.crustbusters.com](http://www.crustbusters.com), 1-888-878-2296. (IM)

## MISCELLANEOUS

1987 F-700, diesel, 5 speed, 2000 gallon hydraulic lift, fully opening rear end tank, good for hauling & dumping mud, 310 cfm pump, \$6900. 405-235-8600. (PI1)

LBC Mfg. is making aerobic disinfection simple and inexpensive. Adaptable to any wastewater pump tank and the only NSF approved liquid chlorinator on the market. Check us out at [www.liquidchlorinator.com](http://www.liquidchlorinator.com). (I7)

## PUMPS

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

## TRUCKS

1992 MACK - ALL Mack with Del Zotto side shift monorail septic tank hauler. One owner. \$25,000 USA. 314-220-8676. (I12)

SEPTIC TANK SET TRUCK: 1994 Freightliner, Cummins 330E, 20,000 lb. winch, excellent set truck. \$37,500 OBO. 903-818-3307. (I01)

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3. **Demonstration rooms** are limited so call today to reserve yours.
4. **Advertise in the conference program**, which is distributed to all our attendees—giving you great exposure.

For a full Exhibitor/Advertiser Prospectus, please visit  
[www.nowra.org/exhibitor.html](http://www.nowra.org/exhibitor.html)  
Questions? Call 831-464-4884 or  
email [info@nowra.org](mailto:info@nowra.org).

**NOWRA**  
National Onsite Wastewater  
Recycling Association

## 4 great reasons to attend the Installer Academy

1. **Technical Education.** Basic to advanced training sessions present the skills and procedures for conventional and advanced treatment systems. Earn CEUs while preparing for the NEHA Installer Credential Exam.
2. **NAWT Vacuum Truck Technician Training.** If you own or operate a vacuum truck used to clean septic tanks, aerobic treatment units, holding tanks, or grease traps, this session is for you.
3. **Business Management Sessions.** Learn the latest on ways to better manage your business.
4. **The 2nd Annual NOWRA Roe-D-Hoe.** Have fun competing or just watch as competitors show off their dexterity and finesse with a backhoe.

Online registration begins August 4th at  
[www.nowra.org](http://www.nowra.org).

## Measuring Flows

An article in the May/June Florida Onsite Wastewater newsletter by Albert Royster states that flow measurement may hint if hydraulic overloading has occurred and if this condition is an ongoing issue in system performance.

Royster, an environmental specialist with the Volusia County Health Department in Deland, says water flowmeters register the mass flow used. The mass flow includes showers, baths, toilets, dishwashing, laundry, tooth brushing and other indoor uses. Lawn watering, car washing and other outdoor uses also are considered. "A flowmeter eliminates any argument from homeowners about water usage," writes Royster.

Royster also suggests metering sewage flow to determine the exact amount without comparing the mass flow from water used for filling the swimming pool or irrigating the yard. Infiltration, inflow, exfiltration, broken sewer lines or missing cleanout caps all affect the flow entering the tank.

"Metering sewage flow offers a way to monitor those systems where hydraulic overloading is suspected," he says. "Additional measures to conserve water could be addressed in those cases to prevent system overuse. Homeowners should be able to monitor daily sewage flow accurately." Contact Royster at 386/822-6250.

## Iowa No. 1

The Summer issue of *Iowa Septic News* announced that the state has 27 National Environmental Health Association (NEHA)-certified installers. Ohio is second in the nation with 18 credentialed installers. The Iowa Onsite Waste Water Association will offer the NEHA installer exam at its annual conference and around the state as interest arises. Call Doug Bird at 319/352-0332.

## Scholarship Winner

Eric Ogden received a \$500 scholarship from the Iowa Onsite

Waste Water Association for the 2008-2009 academic year. He is the son of Diane and Jeff Ogden. Eric, a junior at Indiana Institute of Technology, is studying business and recreation management. During summer vacations, he works at his family's business, Oasis Well & Pump in Manchester, as an assistant to the pump and onsite installer.

## Sewage Into Biofuel

The Spring/Summer issue of *Small Flows* reports that scientists at Old Dominion University, Norfolk, Va., have begun a pilot project that turns algae into biodiesel. By feeding wastewater to the organisms, researchers hope to generate up to 200 gallons of biodiesel a day. If the process is successful, it then could be repeated at sewage plants nationwide. Visit [www.odu.edu/ao/research/vcerc/research/biodiesel.shtml](http://www.odu.edu/ao/research/vcerc/research/biodiesel.shtml).

## CALENDAR OF EVENTS

### Oct. 12-15

Virginia Onsite Wastewater Recycling Association Conference and Trade Show, Blacksburg. Call Trapper Davis at 804/966-9190 or visit [www.vowra.org](http://www.vowra.org).

### Oct. 14-15

Delaware Onsite Wastewater Recycling Association Conference and Exhibition, Dover Downs Hotel and Conference Center, Dover. Call Ken Walsh at 302/381-6516 or visit [www.dowra.org](http://www.dowra.org).

### Oct. 23-26

Ontario Association of Sewage Industry Services Conference and Exposition, Best Western Conference Centre, Orillia. Call Don Kelloway at 877/202-0082 or visit [www.oasisontario.on.ca](http://www.oasisontario.on.ca).

### Dec. 4-5

Kentucky Onsite Wastewater Association Conference, Sloan Convention Center, Bowling Green. Call 270/715-0043 or visit [www.kentuckyonsite.org](http://www.kentuckyonsite.org).

### Dec. 8-10

NOWRA Installer Academy, Riviera Hotel, Las Vegas, Nev. Call 800/966-2942 or visit [www.nowra.org](http://www.nowra.org).

### Jan. 8-10

Michigan Onsite Wastewater Recycling Association Conference and Exhibits, Kellogg Hotel and Conference Center, East Lansing. Call Chanin Frank at 989/773-6985, ext. 258, or visit [www.mowra.org](http://www.mowra.org).

### Jan. 13-14

Iowa Onsite Waste Water Association Conference, Polk County Convention Center, Des Moines. Call 515/225-1051 or visit [www.iowwa.com](http://www.iowwa.com).

### Jan. 13-15

Michigan Onsite Wastewater Conference, Kellogg Hotel and Conference Center, East Lansing. Many sessions count for required CEU hours. Call Mark Scott at 989/275-5011 or e-mail [mscott@i2k.com](mailto:mscott@i2k.com).

### Jan. 13-15

Ohio Onsite Wastewater Association Conference and Trade Show, Ramada Plaza Hotel and Conference Center, Columbus. Call 866/843-4429 or visit [www.ohioonsite.org](http://www.ohioonsite.org).

### Jan. 19-21

Missouri Smallflows Organization Conference and Exhibition, Holiday Inn Select, Columbia. Call 417/739-4100 or visit [www.mosmallflows.org](http://www.mosmallflows.org).

### Jan. 22-24

Alberta Onsite Wastewater Management Association Conference, Deerfoot Inn and Casino, Calgary. Call 780/489-7471 or visit [www.aowma.com](http://www.aowma.com).

### Jan. 23-24

The State of Washington Onsite Sewage Association Conference, Vancouver. Call John Thomas at 253/297-2837 or visit [www.wossa.org](http://www.wossa.org).

### Jan. 30-31

Wisconsin Liquid Waste Carriers Association and Wisconsin Onsite Water Recycling Association Joint Convention, Marriott West Hotel, Madison. Call 608/255-2770 or visit [www.wowra.com](http://www.wowra.com).

### Feb. 11-12

Nebraska Onsite Waste Water

Association Conference. Call Lee Orton at 402/476-0162 or visit [www.nowwa.org](http://www.nowwa.org).

### Feb. 12-13

Utah On-Site Wastewater Association Conference, Expo Center, West Valley City. Call Carmell Burns at 435/797-3174 or visit <http://uwrl.usu.edu/partnerships/training/uowa.html>.

### Feb. 25-28

Pumper & Cleaner Environmental Expo International, Kentucky Exposition Center, Louisville, Ky. Call 800/257-7222 or visit [www.pumpershow.com](http://www.pumpershow.com).

### April 6-9

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

## TRAINING & EDUCATION

### Soil Manual Online

The Wisconsin Department of Commerce Soil & Site Evaluation Handbook is online at <http://commerce.wi.gov/SBdocs/SB-PowtsManualSoilSite0508.pdf>. The manual is a study guide and reference for certified soil testers.

### Onsite Wastewater Treatment Glossary

The Consortium of Institutes for Decentralized Wastewater Treatment (CIDWT) released its Decentralized Wastewater Treatment Glossary, containing definitions used frequently by industry professionals. Download the 121-page document or submit comments and suggestions at [www.onsiteconsortium.org](http://www.onsiteconsortium.org).

### Soils Course

The Wisconsin Department of Commerce Safety and Buildings is offering a course on "Describing Soil Profiles & Recording Site Data," with classroom instruction and field visits of pretreatment and treatment systems, evaluation and maintenance systems. It will be held Sept. 18 at the Ag Research Station in Spooner and Oct. 10 at Northeast Wisconsin Technical College in Marinette. Call Jean Joyce at 608/267-7113.

## NAWT

The National Association of Wastewater Transporters has scheduled these sessions:

- Sept. 9 – Vacuum Truck Technician Training, Holiday Inn at Six Flags, Eureka, Mo. Call NAWT at 800/236-6298 or visit [www.nawt.org](http://www.nawt.org).
- Sept. 10-11 – Septage/Grease Trap Waste Treatment Symposium, Holiday Inn at Six Flags, Eureka, Mo. Call NAWT at 800/236-6298 or visit [www.nawt.org](http://www.nawt.org).
- Sept. 11-12 – Operation and Maintenance Part 2, Mill Valley, Calif. Call 707/579-4882 or visit [www.cowa.org](http://www.cowa.org).
- Sept. 18-19 – Operation and Maintenance Part 1, San Marcos, Calif. Call 707/579-4882; [www.cowa.org](http://www.cowa.org).
- Oct. 11-12 – Inspector Training and Certification, Austin, Texas. Call 512/370-1977.
- Oct. 14 – Inspector Recertification Training, Holiday Inn, Casa Grande, Ariz. Contact Kitt Farrell-Poe at 928/782-3836; [kittfp@ag.arizona.edu](mailto:kittfp@ag.arizona.edu).
- Oct. 23-24 – Inspector Training and Certification, Fresno, Calif. Call 707/579-4882; [www.cowa.org](http://www.cowa.org).
- Nov. 12-13 – Operation and Maintenance Part 2, Mill Valley, Calif. Call 707/579-4882; [www.cowa.org](http://www.cowa.org).

## Alabama

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

- Sept. 3-5 – Advanced Installer Level 1
- Oct. 2-3 – Continuing Education, Gadsden
- Oct. 16-17 – Pumps
- Oct. 29-30 – Continuing Education, Mobile
- Nov. 12-14 – Basic Installer
- Dec. 4-5 – Continuing Education
- Dec. 10-12 – Advanced Installer Level 2

Call Allen Tarrt 205/652-3803 or visit [www.aowatc.uwa.edu](http://www.aowatc.uwa.edu).

## California

Certification courses are sponsored by the California Onsite

Wastewater Association and NAWT.

- Sept. 11-12 – Operation and Maintenance Part 2, Mill Valley
- Sept. 18-19 – Operation and Maintenance Part 1, San Marcos
- Oct. 8 – Soils, TBD
- Oct. 23-24 – Inspector Training and Certification, Fresno
- Nov. 12-13 – Operation and Maintenance Part 2, Mill Valley  
Call Cliff Trammel at 707/579-4882 or visit [www.cowa.org](http://www.cowa.org).

## Georgia

The Georgia E.O.G. Alliance has a Fats, Oils & Grease inspection training course Oct. 8-10 at the Atlanta Marriott Hotel in Atlanta. Call Chester Gudewicz Jr. at 770/724-1480 or visit [www.georgiafog.com](http://www.georgiafog.com).

## Iowa

The Iowa Onsite Wastewater Training Center at Ankeny has these courses:

- Oct. 16 – Media Filters with Installation Demo
- Nov. 20 – Program Management with Rules

Call Annette Adams at 800/362-2127, ext. 6464, or e-mail Dennis Hayworth at [dahayworth@dmacc.edu](mailto:dahayworth@dmacc.edu).

## Michigan

The Michigan Onsite Wastewater Training and Education Center at MSU Tollgate Center in Novi is offering these courses:

- Sept. 24-25 – Onsite Wastewater Systems Maintenance
- Oct. 8-9 – Existing Systems Evaluator Training

Contact Barb DeLong at 517/355-4720 or visit [www.egr.msu.edu/age](http://www.egr.msu.edu/age), then Outreach.

## Missouri

The Department of Health and Senior Services is offering the following training professional CEU courses:

- Sept. 9-10 – Troubleshooting and Hydraulics, Cape Girardeau
- Oct. 7-8 – Troubleshooting and Hydraulics, West Plains
- Oct. 21-22 – Lagoons and Drainfields/Curtain Drains, Camdenton
- Oct. 28-29 – Lagoons and Drainfields/Curtain Drains, Moberly
- Nov. 4-5 – Troubleshooting

and Hydraulics, Joplin

- Nov. 17-18 – Drip and Pumps/Panels/Electrical, Liberty
- Dec. 2-3 – Lagoons and Drainfields/Curtain Drains, Springfield
- Dec. 9-10 – Operation and Maintenance, Warrenton
- Dec. 16-17 – Lagoons and Drainfields/Curtain Drains, Ironton  
Call Terri at 417/739-4100 or visit [www.mosmallflows.org](http://www.mosmallflows.org).

## Nebraska

The Cooperative Extension at University of Nebraska is offering the following certified courses for CEUs:

- Sept. 19 – Basics of Onsite Wastewater Systems 102, Holdrege
- Sept. 24 – Extension Pumps & Controls, Scottsbluff
- Sept. 25 – Extension Dosed Systems, Scottsbluff
- Sept. 30 – Basics of Onsite Wastewater Systems 102, York
- Oct. 15 – Extension Pumps & Controls, Norfolk
- Oct. 16 – Extension Dosed Systems, Norfolk
- Nov. 19 – Extensions Pumps & Controls, Grand Island
- Nov. 20 – Extension Dosed Systems, Grand Island
- Dec. 10 – Extension Pumps & Controls, Mead

Call the Nebraska Onsite Waste Water Association at 402/476-0162 or the university at 402/472-9614.

## North Carolina

North Carolina Soils and On-Site Wastewater Training Academy is offering the following courses at Raleigh unless stated otherwise:

- Sept. 10-12 – Subsurface Wastewater Operator, Bolivia
- Oct. 1 – Land Application
- Oct. 22 – Dewatering Facility Tour
- Nov. 5-7 – Subsurface Wastewater Operator, Plymouth
- Nov. 18-19 – Onsite Wastewater System Inspector, Plymouth
- Nov. 19 – Land Application

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

## Pennsylvania

The Pennsylvania Septage Management Association offers a Basic Onlot

Wastewater Treatment System Inspection Certification course on Sept. 17-18 in Williamsport and Sept. 24-25 in Butler. Call 717/763-7762 or visit [www.pasma.net](http://www.pasma.net).

## Rhode Island

The University of Rhode Island's Onsite Wastewater Training Center offers these professional development workshops at its Kingston campus:

- Sept. 4 – Conventional Onsite Wastewater Treatment Basics for Installers
- Sept. 10 – Innovative and Alternative Technology Overview
- Sept. 17-18 – Conventional Septic System Inspection
- Oct. 2 – Bottomless Sand Filter Design and Installation
- Oct. 16 – Innovative and Alternative Systems Field Tour
- Nov. 6 – Designer Examination Prep
- Nov. 20 – AutoCALCS - Automated BSF Sizing, Pump Calculations and Support Materials
- Dec. 4 – Regulatory Setbacks and Buffers
- Dec. 18 – Nitrogen Dynamics in the Environment and Onsite Wastewater Systems

Call Mark Stolt at 401/874-2915 or visit [www.uri.edu/ce/wq](http://www.uri.edu/ce/wq).

## Virginia

The following courses by the Virginia Center for Onsite Wastewater Training (VCOWT) and Southside Virginia Community College are in Blackstone unless stated otherwise.

- Sept. 18-19 – Pumps and Controls
- Oct. 12-15 – A to Z of Onsite Wastewater, Blacksburg (VOWRA)
- Oct. 12-15 – Soils, Blacksburg (VOWRA)
- Oct. 14-15 – Construction Inspection
- Oct. 23-24 – Understanding Water Movement in Soils
- Oct. 28-29 – Construction Inspection
- Nov. 19-20 – Effluent Dispersal Systems
- Dec. 10-11 – Wastewater 101

For VCOWT classes, contact Debbie Campbell at 434/736-2011 or visit [www.southside.edu/classes\\_wastetreat.asp](http://www.southside.edu/classes_wastetreat.asp). For VOWRA courses, contact Trapper Davis at 804/966-9190 or visit [www.vowra.org](http://www.vowra.org). ■



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