

February

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against wicked Minnesota winters

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Conquering Cold

By Gil Longwell

ON THE COVER: Jim Bertucci (left) and his son Jamie Bertucci of A-1 Services in Eveleth, Minn., install a heating unit from Septic Heater Co., one of the measures they use to build freeze-protected onsite systems. (Photo by Debra Jensen)

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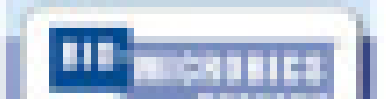




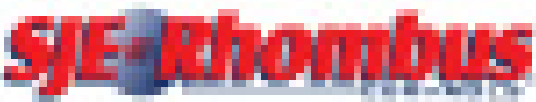





Coming Next Month: March 2008

Sump and Aeration Pumps

- Profile: University of Missouri soil scientist Randall Miles
- Basic Training: Troubleshooting pumps in onsite systems
- Overheard Online: Installers discuss inlet tees and solutions to odor problems
- Machine Matters: The benefits of hydrostatic drive

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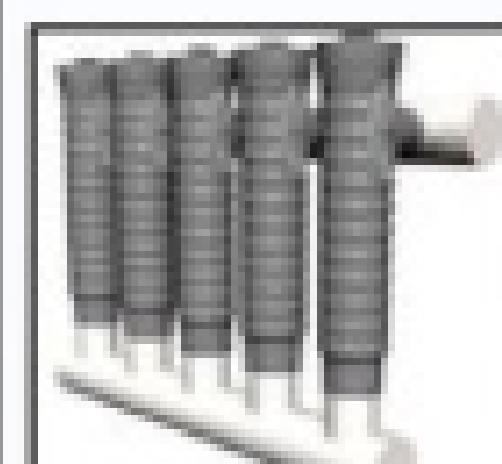
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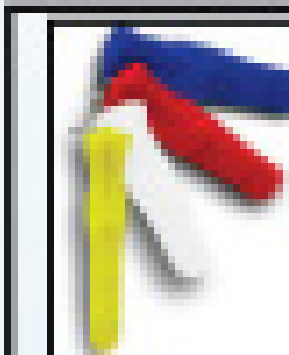


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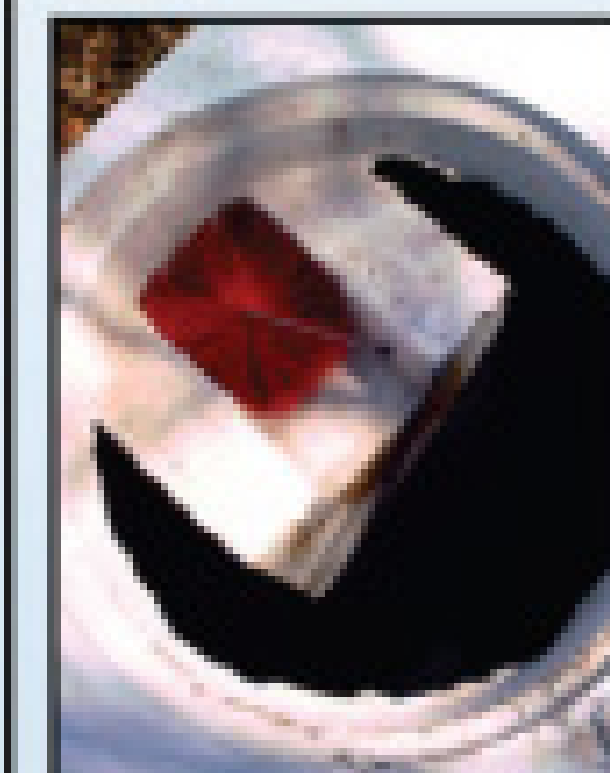
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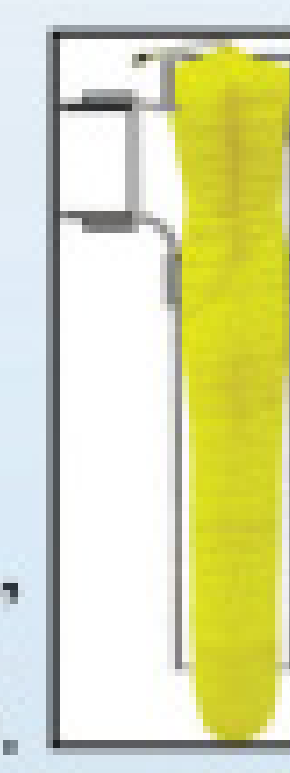


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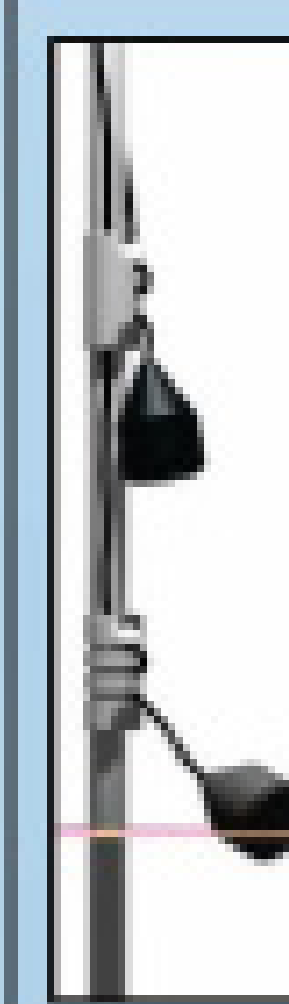


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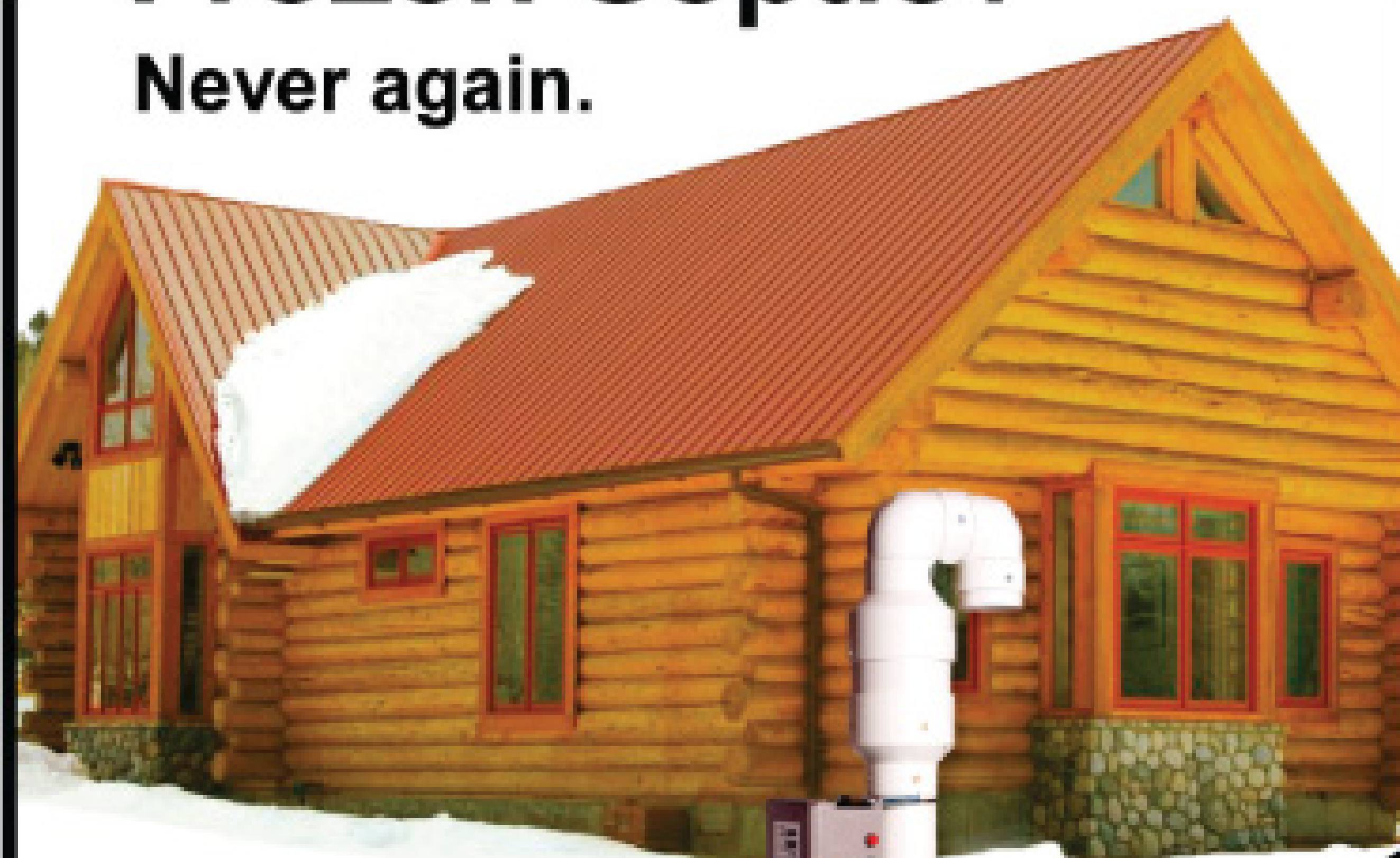
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Bringing It All Back Home

As we begin to see the full costs of building and maintaining 'big pipe' sewers, opportunities grow for onsite treatment technology. Is the industry ready?

By Ted J. Rulseh

Maybe it was a case of the pendulum swinging too far. Historically speaking, sanitary sewers were the salvation of health in cities. Sewers helped put a stop to all manner of horrific and readily preventable diseases that had been spread by human waste.

But somewhere along the line, it became dogma that sewers were always better than any alternative. Maybe it was years of long experience with open latrines and out-houses. Maybe it was more years of seeing the harm septic systems did when built where they didn't belong.

In my days as a journalist I covered many plan commission meetings where debate over new subdivisions centered on whether the site in question was within cost-effective reach of the *big pipe*. Septic systems were at best temporary. Sewers were always preferable.

Bills come due

That was before society began to appreciate what it costs to maintain and repair all those pipes buried all those years ago — and what it still costs to build new pipes and new wastewater treatment capacity. It was also before scientists and regulatory officials figured out which types of soils could support septic systems and which could not.

It was also before inventors figured out essentially how to take the processes that work in big municipal treatment plants and

translate them into small systems that can cost-effectively serve individual homes and small cluster communities.

So there we have it. Septic systems still face a stigma from years of bad experiences with primitive treatment technology (and, to be fair, less than ideal system installations). Yet now, no less than the U.S. EPA is on record saying that onsite systems deserve to be a per-

stream by way of a treatment plant outfall.

Time of opportunity

Do we appreciate what this means in terms of opportunity to do good for the environment, good for taxpayers' pocketbooks, and good for our own businesses? If not, we should. Think of it. Perhaps a majority of homes being built today are outside the existing reach

Every single thing that undermines public faith in onsite systems undermines the big opportunity for the industry. The adage is true: It takes years to build a good reputation, and only 15 minutes to destroy it.

manent part of the national wastewater treatment infrastructure.

Consensus now has it that under certain conditions, onsite systems are *better than* the big pipe. Under what conditions? Well, when systems are designed, installed and maintained properly. And when technology is applied that fits the needs of the site. Thanks to the vast range of technologies available, that is now possible almost regardless of site and soil conditions.

Onsite systems have the added benefit — more appreciated in these times of regional water scarcity — of keeping water within the same watershed or sub-watershed, instead of simply sending it down-

stream by way of a treatment plant outfall.

of municipal sewers. If indeed onsite systems are as effective as centralized treatment, then the big pipe doesn't have to be extended to those areas.

One of the main things standing in the way of that opportunity is the old stigma. Fundamentally, that is what needs to be broken down before onsite systems can take their rightful place among treatment alternatives.

What will break down the stigma? Several things. For one, a more credible onsite industry — one that can get people to listen when it speaks, and ideally speaks with one voice. For another, more credible industry members — highly educated and skilled profes-

sionals who know their business and will never cut a technical or ethical corner.

If the industry and its members are seen as less than credible, then onsite systems and technologies will continue to be suspect. The way to build credibility in the long run is quite simply to build system after system after system that does its job.

The long view

Every single thing that undermines public faith in onsite systems undermines the big opportunity for the industry. The adage is true: It takes years to build a good reputation, and only 15 minutes to destroy it.

So as you do the things true professionals do — like taking part in discussions about rules and regulations, taking regular training and providing it to employees, following sound design and installation practices every time, learning and applying new technologies, serving as an education resource for customers and — perhaps most difficult — having zero tolerance for those whose bad behavior pulls the industry down — think to yourself about what is at stake.

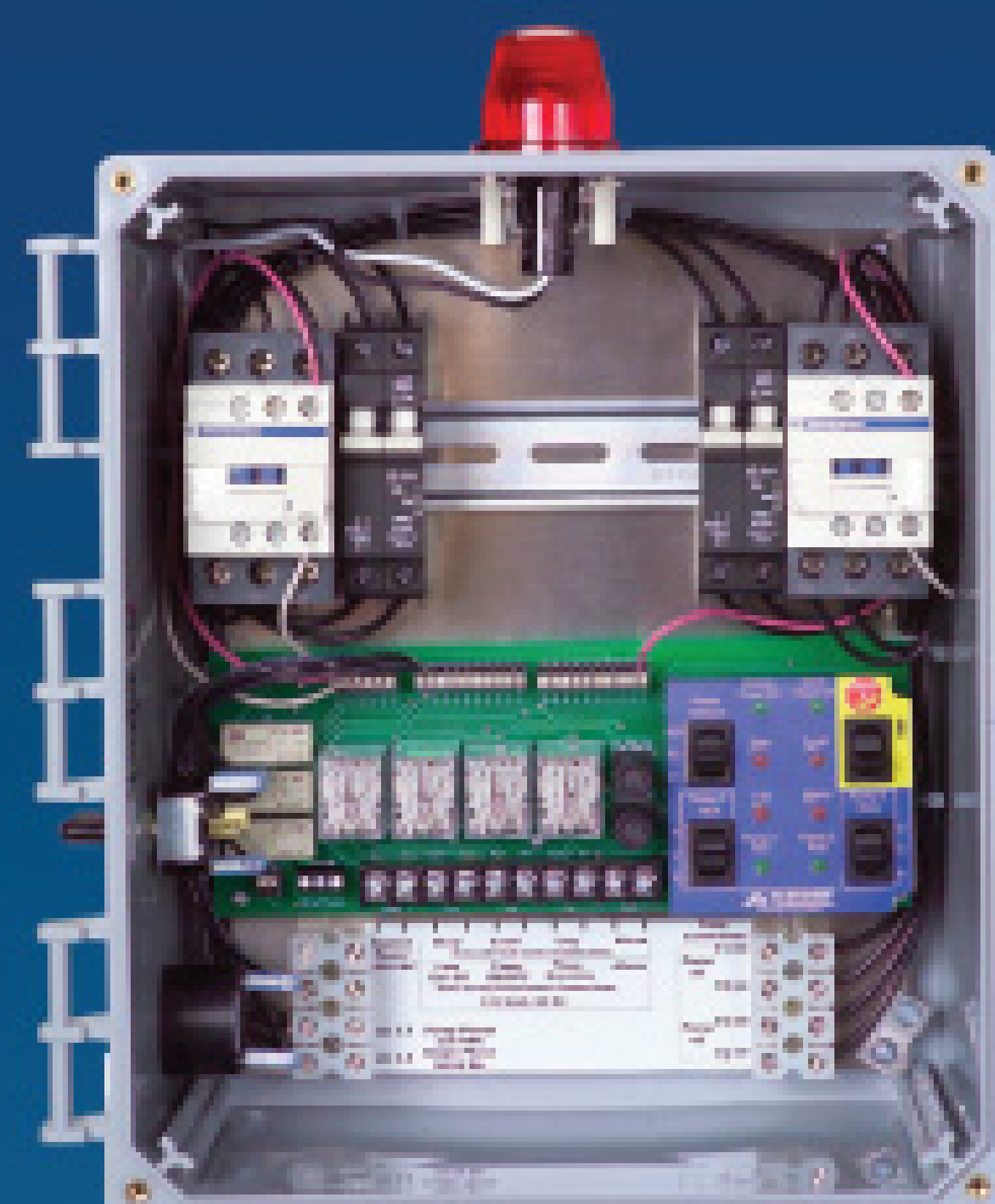
What is at stake is nothing less than a highly promising future for the onsite treatment industry. ■



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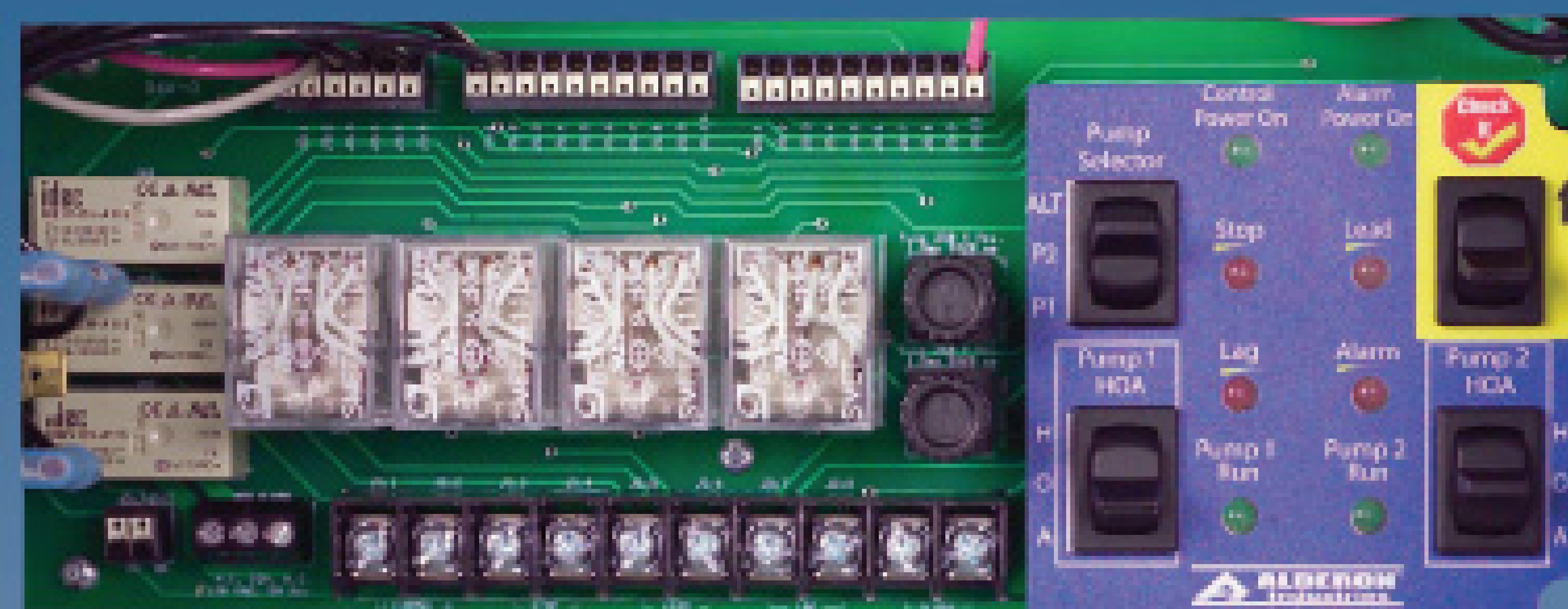
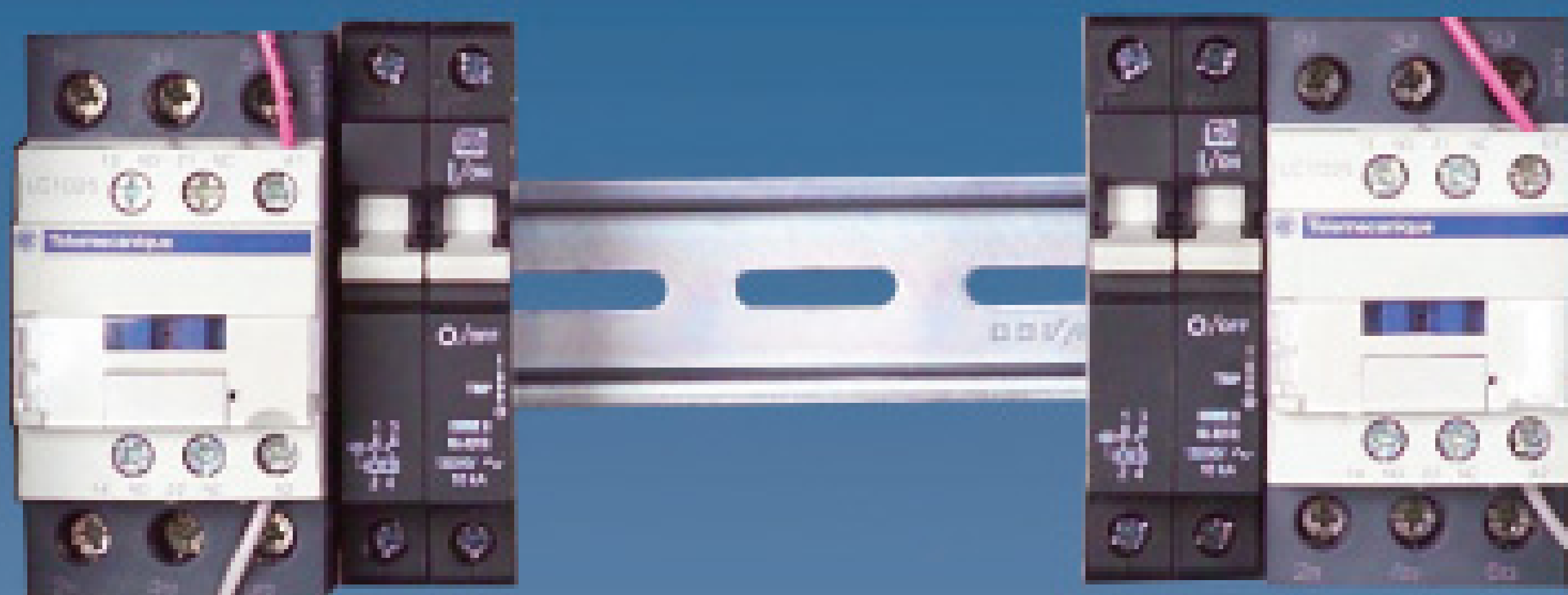
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The shows are always an exceptional value. This year there is more of everything. More exhibits in a much larger exhibit hall is making it easier for the industry's top manufacturers, dealers and suppliers to show you what they have to offer. The number of educational programs has been increased, offering you more opportunities to learn and take knowledge back home to help you grow your businesses. There is also more entertainment than ever before, and with a line up that includes Jeff Foxworthy, Big & Rich, Cowboy Troy and John Corbett, it's hard to imagine anyone not having a great time.

The best of the industry is here and that includes you. All of us at COLE Publishing want you to enjoy the show, enjoy Louisville and enjoy yourselves.

Bob Kendall
Co-founder
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Schedule of Events

WEDNESDAY

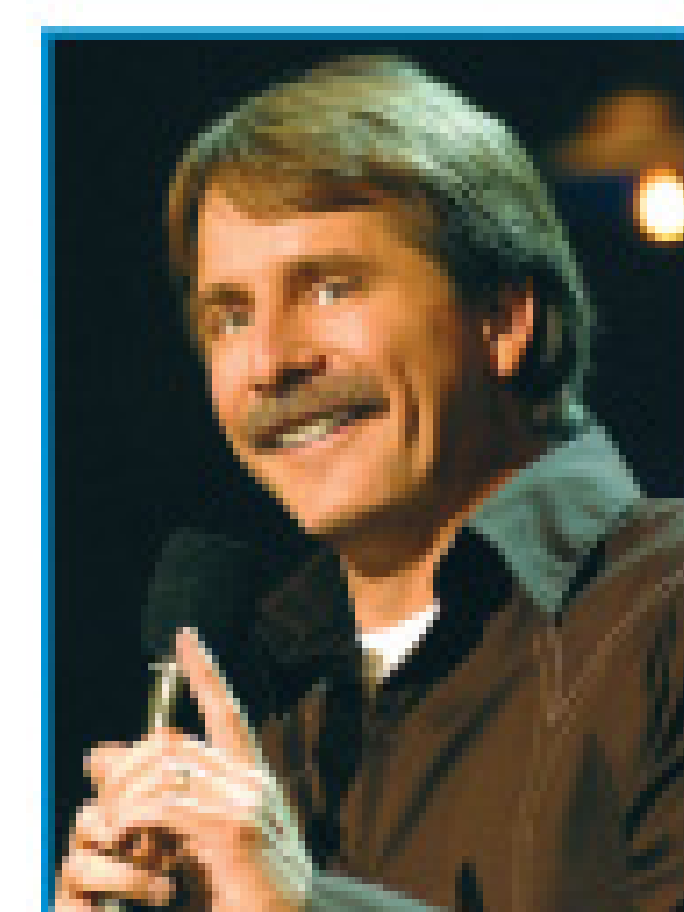
February 27, 2008

- Education Day
- 56 Educational Sessions (Exhibit Halls Closed)
- Industry Appreciation Lounge open (COLE Pub)

THURSDAY

February 28, 2008

- Certified Onsite Installer Course
- Exhibits Open: 9 a.m. - 5 p.m.
- Educational Seminars: 8 a.m. - 12 p.m.
- Industry Appreciation Party
5 p.m. • Cash Bar
- Jeff Foxworthy - 7 p.m. • Cash Bar



FRIDAY

February 29, 2008

- Exhibits Open: 9 a.m. - 5 p.m.
- Educational Seminars: 8 a.m. - 12 p.m.
- Industry Appreciation Lounge open (COLE Pub)

SATURDAY

March 1, 2008

- Exhibits Open: 9 a.m. - 3 p.m.
- Industry Appreciation Lounge open
- Saturday Evening Jam
5 p.m. - John Corbett
7 p.m. - Big & Rich w/Cowboy Troy

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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.

Completing the Picture

Landscaping can be a good addition to an installer's business. Choose site plantings with care to protect long-term system performance.

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

Previously we have discussed the importance of finishing the job, which means the site is cleaned up and the backfill is done properly and leveled. In many cases, this is where the homeowner takes over and finishes the landscaping.

This is a major reason we suggest a follow-up visit about a month after installation. During that visit, you can make sure that everything is working properly and that the landscaping is completed — in a manner that will not harm system performance.

In the past, we have suggested that installers might be able to expand business opportunities by taking on the landscaping. Even if this is not where you want to go with your business, it is important that you be able to provide the homeowner with some basic information on the do's and don'ts of landscaping.

Basic principles

These recommendations reflect our Minnesota location in that they are suited to more humid and cooler climates. However, the underlying principles apply anywhere. The right vegetative cover helps keep the soil in place, lets the system function at its best by removing moisture and nutrients from the

soil, provides an insulating layer, and makes the area more attractive.

However, planting the wrong vegetation can interfere with system performance. Trees, shrubs and any herbaceous plants that have extensive root systems should not be placed on or near the system. Herbaceous plants such as turf grasses, wildflowers and native grasses are suitable for cover.

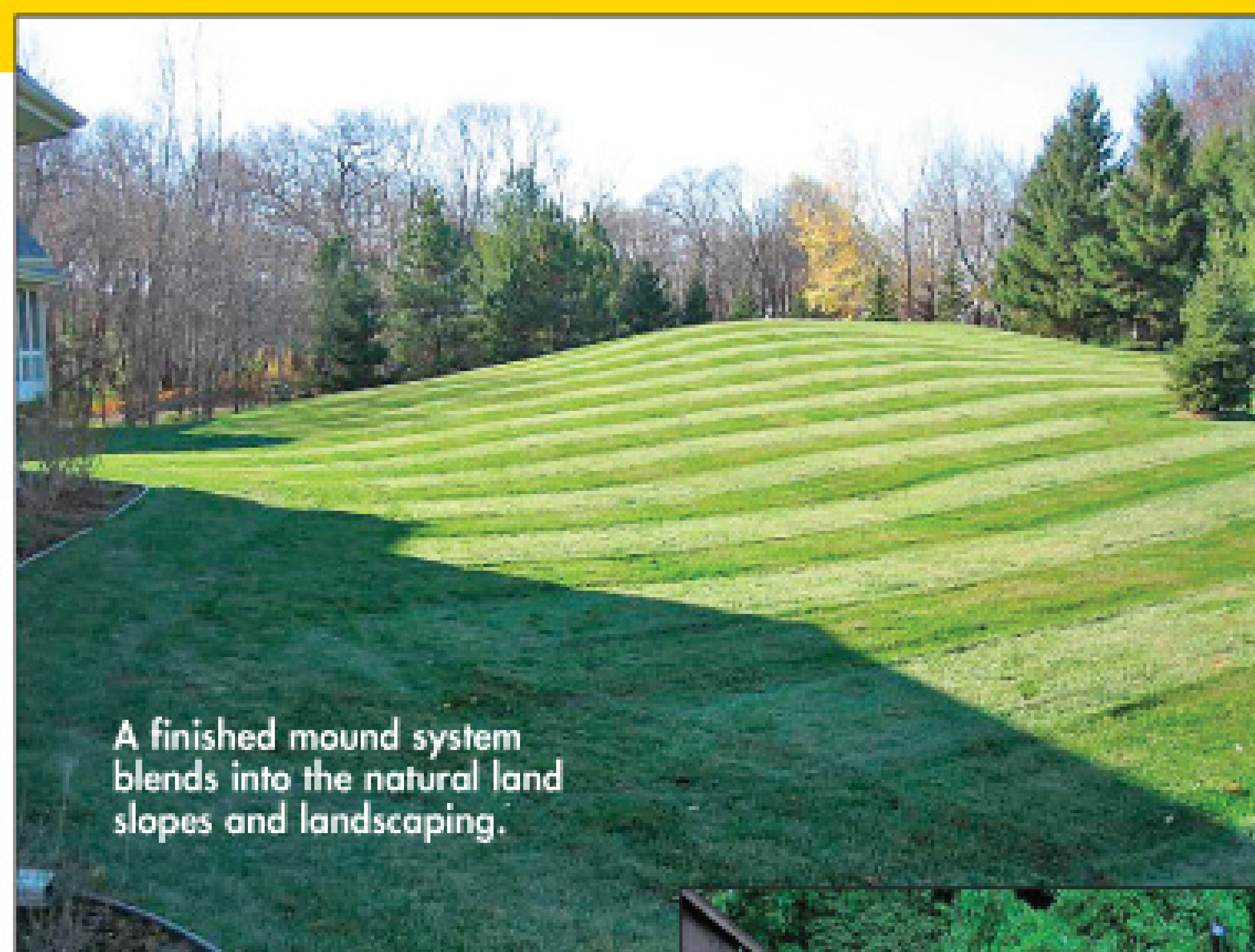
Check with your local university Extension office for a list of plants that fit this category. Alternatively, you can visit with local landscapers and nurseries for such a list.

Turf grasses have fibrous roots that hold soil in place, require maintenance similar to a lawn and are available in many varieties, including shade-tolerant, to suit site conditions.

Wildflowers and native grasses are an attractive alternative to turf grass and provide the same benefits with less maintenance and more drought tolerance. It is important to plan the site carefully to avoid problems with plant establishment caused by soil compaction.

Working with mounds

Minnesota and other Midwestern states have many mound systems. While mounds are not always desirable from a homeowner's per-



A finished mound system blends into the natural land slopes and landscaping.

spective, they do not have to look like a "big pile of dirt."

The right landscaping can minimize the visual impact and maximize protection of the system. You can change the mound's shape to incorporate landscaping ideas. It can serve as a privacy barrier, a windbreak, or as a screen to block unsightly views. Here are some guidelines to follow:

- Topsoil or cover should be at least 6 inches and no more than 30 inches deep.
- Use minimal tiling when planting.
- Use plants that prefer dry soils near the septic system.



This installation shows finishing next to the driveway and establishment of grass vegetation to prevent water and sediment from running over the system.

This will prevent their roots from interfering with the system. The larger the plant, the

more extensive (though not necessarily deeper) the root system.

- Do not place trees or shrubs on the mound. For aesthetics, the mound can be framed with trees and shrubs, which should be kept at least 20 feet from the edges of the system. Trees known for seeking water such as poplar, maple, willow and elm should be planted no closer than 50 feet. Shrubs should not be planted on mounds or drainfields.
- Minimize traffic over the system. Never drive across the system, as this can cause soil compaction and lead to erosion problems. In winter there should be no activities over the top of either a mound or a drainfield.

The right vegetative cover helps keep the soil in place, lets the system function at its best by removing moisture and nutrients from the soil, provides an insulating layer, and makes the area more attractive.

- Do not plant edible plants on the mound or drainfield.
- Annually inspect systems for animal burrowing and tunneling. Control animals at the first signs, before they do extensive damage.
- Root barriers (geotextile fabric impregnated with a herbicide that kills plant roots) have been used on mounds. They are expensive to install, and if you select plantings properly, such a barrier should not be necessary.

Erosion control

While the plants are establishing (the first two years after planting) it is important to place a mulch or an erosion control blanket on mounds or sloping sites to reduce runoff and erosion.

Turf grasses work well for this purpose. Low-maintenance grasses such as fine fescues make a dense cover and only need to be mowed a few times a year. Fine fescues such as creeping red, hard, sheeps and chewing fescues are shade-tolerant and often are mixed with Kentucky bluegrass.

To establish grass cover, there are two primary methods: seeding and sodding. Here is a summary of the pros and cons of each:

	ADVANTAGES	DISADVANTAGES
Seeding	<ul style="list-style-type: none"> • More varieties to choose from • Less expensive • Stronger root system 	<ul style="list-style-type: none"> • Initial establishment takes longer • Seeding times limited to late summer/early fall • Moisture is critical for establishment
Sodding	<ul style="list-style-type: none"> • Rapid establishment • Weed-free • Good for slopes or erosion-prone areas • Can be laid anytime during growing season 	<ul style="list-style-type: none"> • Expensive • Less selection, especially in drought- or shade-tolerant varieties

Erosion control is important when establishing grass. An erosion-control blanket can be laid after seeds have been planted. This will help retain moisture and protect the seeds and soil. Another product available is an erosion-control blanket with seed. These blankets are made of organic material that will decompose over time.

Winter insulation

Vegetative cover is critical to insulate the system over winter. Well-established vegetation helps hold snow in place where it can insulate all parts of the system. Snow keeps the heat from the sewage and soil from escaping and keeps the frost layer shallow. In the absence of snow cover, a dense vegetative cover acts as an insulating layer, helping prevent the system components from freezing.

Following these basic landscaping principles will result in improved system performance and prevent problems. To find out more about landscaping and homeowner maintenance, visit the University of Minnesota Onsite Sewage Treatment Program web site: <http://septic.umn.edu>. ■

Some material in this article was taken from information provided by Jessica Wittwer of the University of Minnesota Onsite Program.



A proper finishing job is important to establishing a good vegetative cover for an onsite system.



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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.

North Carolina Association Defeats Costly Amendment

By **Scottie Dayton**

Doug Lassiter, executive director and lobbyist for the North Carolina Septic Tank Association, reports that rapid action prevented a costly amendment to a bill from becoming law. The proposal, which required pumpers to install effluent filters and risers on septic tanks (if not already in place), was being heard in committee.

If passed, the proposal would have required two technicians per pumper truck transporting excavation equipment and materials. "A pump-out job that usually lasts an

hour could turn into four hours," writes Lassiter. "The cost to the consumer could more than triple, producing negative results for our industry and the legislators who voted for the amendment."

Lassiter and association members called their legislators, expressing the desire to address the amendment in full with all the questions resolved. Their efforts resulted in the language being pulled from the bill.

Rhode Island

The International Association of Plumbing and Mechanical Officials

(IAPMO) Property Standard has been replaced by an IAPMO/ American National Standards Institute (ANSI) Z1000-2007 standard for prefabricated concrete, fiberglass-reinforced plastic, or polyethylene septic tanks. Besides establishing what constitutes acceptable quality, the standard includes requirements for design, materials, performance testing, and markings.

IAPMO/ANSI Z1001-2007, replacing IAPMO PS 80, establishes construction specifications for prefabricated gravity grease interceptors. Developed for producers, distributors, architects, engineers, contractors, installers, inspectors, and users, it addresses design, materials, installation, and marking/labeling for identifying prefabricated gravity grease interceptors that conform to the standard. Both can be purchased online at https://publications.iapmo.org/standards/pub_show_synopsis.asp?doc_id=312.

Washington

New onsite treatment rules now require conventional onsite systems to be inspected every three years, and all other types to be

inspected every year. Island County homeowners may inspect their systems after completing the County Public Health training program, provided the evaluation is not associated with a property sale, and provided the system is conventional and is not located in a sensitive or marine recovery area. In all other cases, the inspection must be done by a professional provider.

The State Department of Health is phasing in the rules over 18 months. County Public Health has initiated licensing for professional maintenance service providers. Training and certifying for homeowners begins early this year. Penalties for non-compliance range from \$25 a day for low-risk violations to \$250 a day for high-risk ones, but the health department imposes fines only as a last resort. No fines will be levied during the 18-month implementation period. ■

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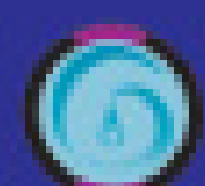
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Hoot has spent the last 6 years and millions of dollars in Research & Development working to get Total Nitrogen below 10 mg/L. During this time the Nitrogen issue has been marginalized and regarded by some as "less important than making sure a riser is screwed down."

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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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Line of Defense

Fuel line filtration devices prevent equipment damage and extend engine life by efficiently removing water and particulate matter

By Greg Northcutt

When it comes to preventing costly damage to diesel engine fuel systems, top quality fuel filters and fuel/water separators are smart choices. By removing hard, gritty microscopic particles, water droplets and other contaminants from the fuel, these devices can help prolong engine life, lower maintenance costs and maximize fuel efficiency.

The role of filters

A fuel filter or a fuel/water separator generally consist of an inner perforated media support tube liner, filter cartridge end caps, heat-cured glue, a round metal housing, seals, thread plate, and the filter media.

"This medium or media is the key technology in a filter assembly," says Matt Stein, liquid filtration product manager for Donaldson Company Inc., a filter manufacturer. "It balances filtering efficiency, capacity and water removal. Different media balance these factors in different ways."

A fuel filter uses a pleated media pack, such as plant, wood or synthetic fibers, to remove particulate contaminants from fuel flowing from the fuel tank to the fuel injectors. It traps abrasive particles that can damage fuel transfer and injection pumps and injectors by scoring finely-machined surfaces.

Such damage can reduce fuel flow and lead to pitting of precision surfaces. What's more, by damag-

ing injector nozzles, the abrasive particles can disrupt the fuel spray pattern in the combustion chamber, causing loss of power, difficult starting, reduced fuel economy, and more harmful emissions.

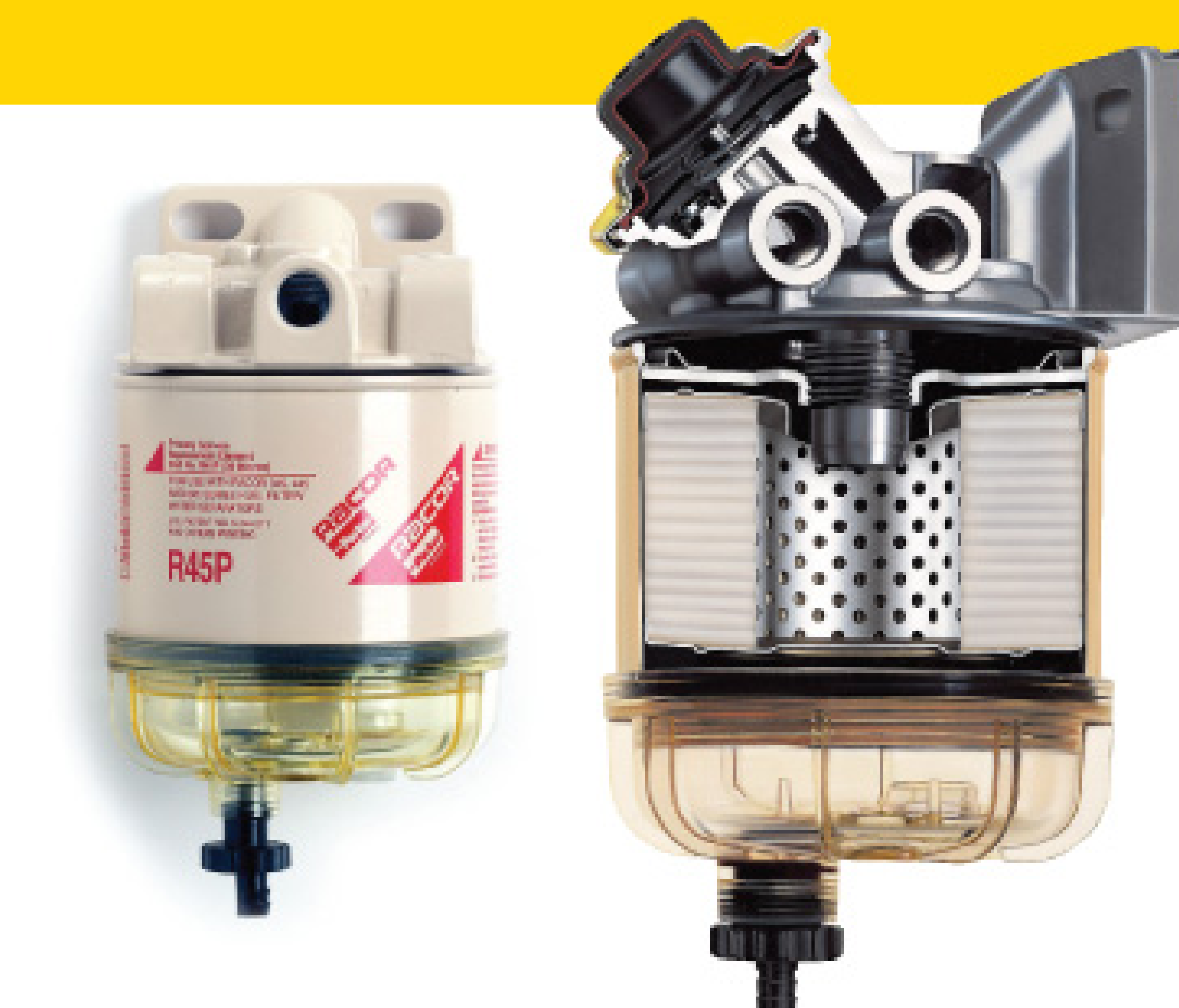
The most efficient of the new engine filters may typically remove more than 98 percent of the particulates larger than 4 microns. (One micron — a millionth of a meter — is 0.00004 inches. The diameter of a human hair is about 70 microns).

A typical fuel/water separator features a hydrophobic media to block damaging water from the fuel as it passes through the pleats. Water flowing at high velocity between highly polished valve seats and through fine nozzle orifices can lead to costly damage. It can cause rust and other chemical corrosion that eats away at finely mated surfaces. Located before any transfer pumps, this type of filter has a water storage sump and drain valve for draining and collecting the water.

Why filters fail

While stopping hard particles is the first job of a diesel fuel filter, it must also resist clogging with natural asphaltenes (sticky tar-like substances dissolved in all diesel fuels except No.1) and the slime from bacteria that live in the interface between the fuel and any water found in the tank.

Asphaltene particles don't have to plug a fuel/water separator to



Racor 445R fuel filter (left) and the same filter in a cutaway view.

cause filter efficiency problems. "Once this filter becomes lightly coated with asphaltenes, the engine will continue to run fine, but the filter's ability to remove free water droplets is reduced, while the ability to remove emulsified water is nearly destroyed," says Steven Hardison, fuel product manager for the Racor Division of Parker Hannifin Corp.

"Regular filter changes, instead of waiting for loss of engine power, provide cheap insurance against engine trouble and water damage." Cold weather can also cause filter clogging when non-winterized fuel gets cloudy with wax crystals, which build up on the filter media

surfaces. An electric or coolant heat exchanger will prevent cold-weather problems. Proper fuel handling will avoid many problems associated with water; but even with the best handling, water from moist air will condense inside fuel tanks and become a problem. That's why it's a good idea to have a good fuel/water separator in the fuel system.

The lower the fuel quality, the more problems with filters plugging. "Heat, fuel degradation and aging causes asphaltenes in the fuel to precipitate into larger, sticky molecules that glob together to plug filters," Hardison says.

Although fuel filters can fail due to loss of structural integrity, usually

they stop working because they have done their job. "All diesel fuel filters have a finite life, and fail eventually due to contaminant clogging," Hardison says. "Lack of timely maintenance and poor fuel quality are the true sources of most perceived failures."

Improving filter technology

Most fuel filters in construction equipment diesel engines use cellulose fibers from various plants and trees to remove hard particles. However, more sophisticated fuel injection systems and increased use of biodiesel are shortening the life of cellulose filters by causing them to plug up faster. As a result, manufacturers are developing more efficient, longer-lasting filters.

One way to increase filter efficiency is to add synthetic fibers, like glass or fine-spun polyesters. These fibers are much smaller in diameter than cellulose fibers. Wood fibers, for example, may have a diameter of 40 microns, while some synthetic fibers may be no larger than about 0.5 microns in diameter. Hard particles in fuel become trapped in the spaces between the fibers. The fibers themselves also catch and hold the particles. Thus, the smaller diameters of synthetic fibers allow manufacturers to fit more fibers into a given space to capture more particles.

This higher efficiency, however, comes at a much higher cost, Hardison notes. "Filters with synthetic media may cost two to three times as much as cellulose filters."

Adding more layers of filter media can also boost efficiency. "Some really high-tech filters may have five or six layers of media, each with a different job," Hardison says. "One may repel water, another resists plugging by asphaltene, others remove particles only of a given size, while the final layer polishes the fuel."

Evaluating your choices

It's important to follow manufacturer specifications for type of filter and the replacement schedule. Your best bet, notes Hardison, is to buy them from the OEM or a reputable distributor.

One way to gauge filter performance is to count the number of pleats. The more pleats, the better the filtering capability, Hardison notes. When checking fuel/water separators, he suggests looking for enough space between pleats of the filter for water to collect and drop off.

Hardison recommends replacing secondary/final filters with high-quality filters of the same micron rating and function. Also, consider upgrading your fuel sys-

"All diesel fuel filters have a finite life, and fail eventually due to contaminant clogging. Lack of timely maintenance and poor fuel quality are the true sources of most perceived failures."

Steven Hardison

Racor Division/Parker Hannifin Corp.

tem with a primary fuel filter/water separator with a drain if it does not already have one. This is especially important if you use biodiesel.

Most North American fuel and water/separator filter manufacturers test their products according to various SAE methods. These include SAE J1985, which measures how efficiently the filter removes particles; SAE J1488, which indicates the ability of the filter to remove emulsified water; and SAE J1389, which tests how well the filter removes droplets of free water.

Manufacturers, however, usually don't report results of SAE tests. Instead they'll describe performance of their filters in other ways. Racor, for example, describes the percentage of water or hard particles of a given size removed by its filters. "If you can't find any test data at all about a product, that's a red flag," Hardison says.

As you prepare for a new work season, it may be worth considering whether your equipment fuel filtration systems are up to the job — and if not, take action. ■

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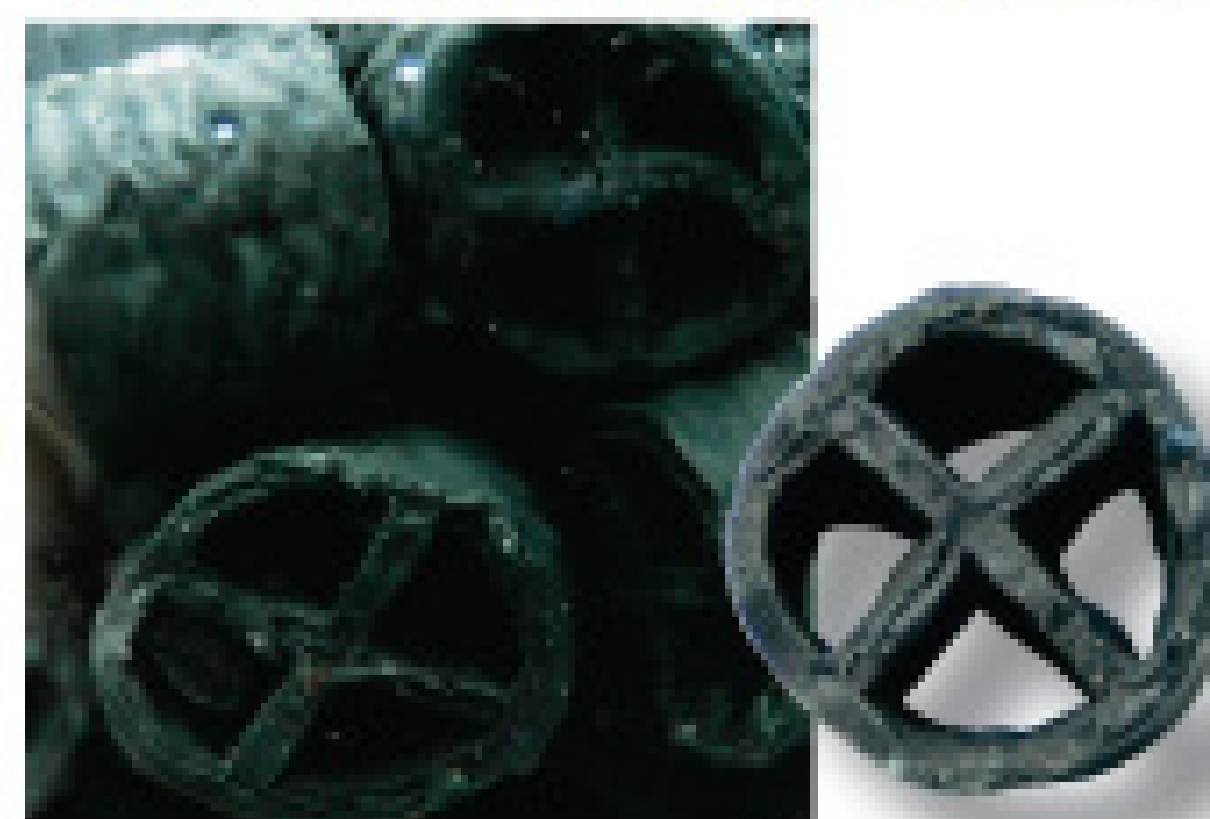
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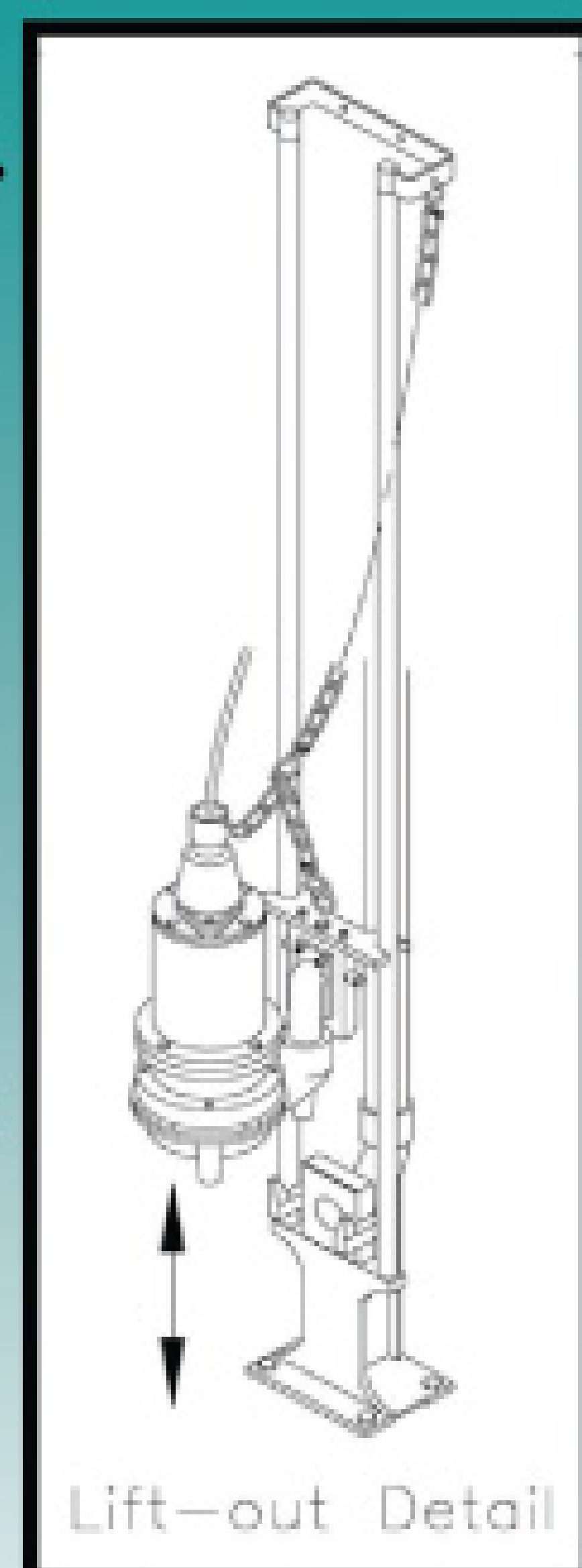
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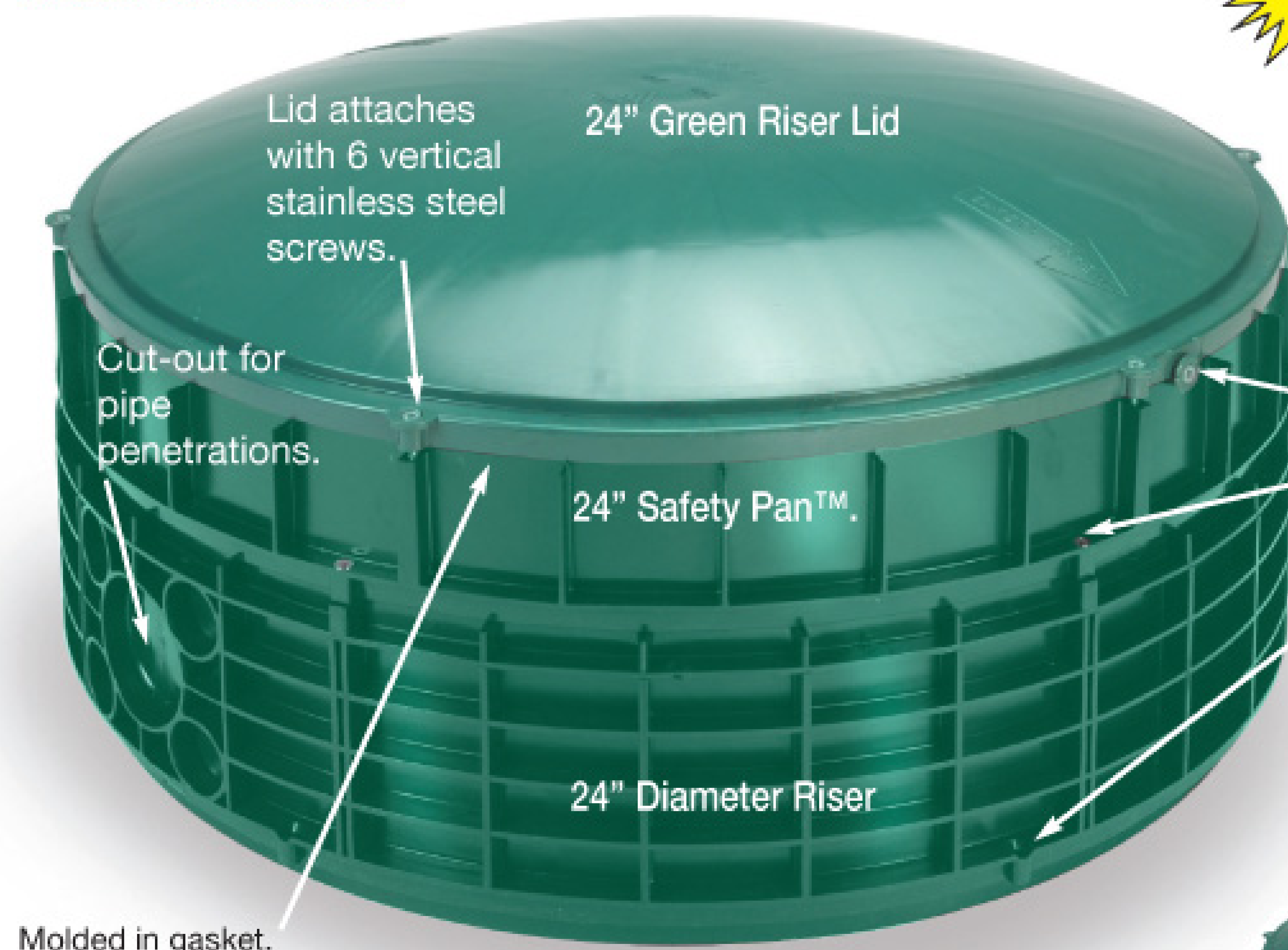
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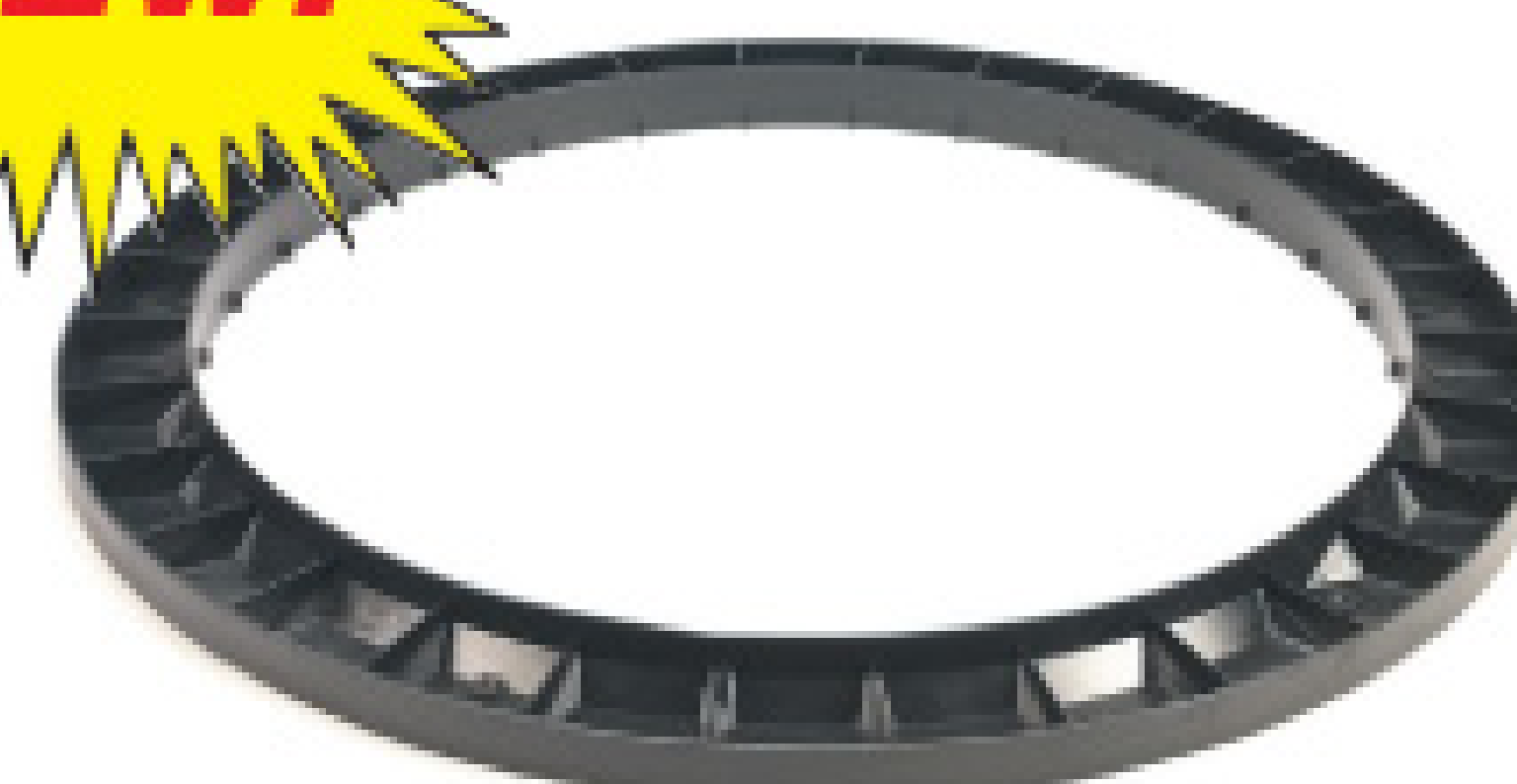
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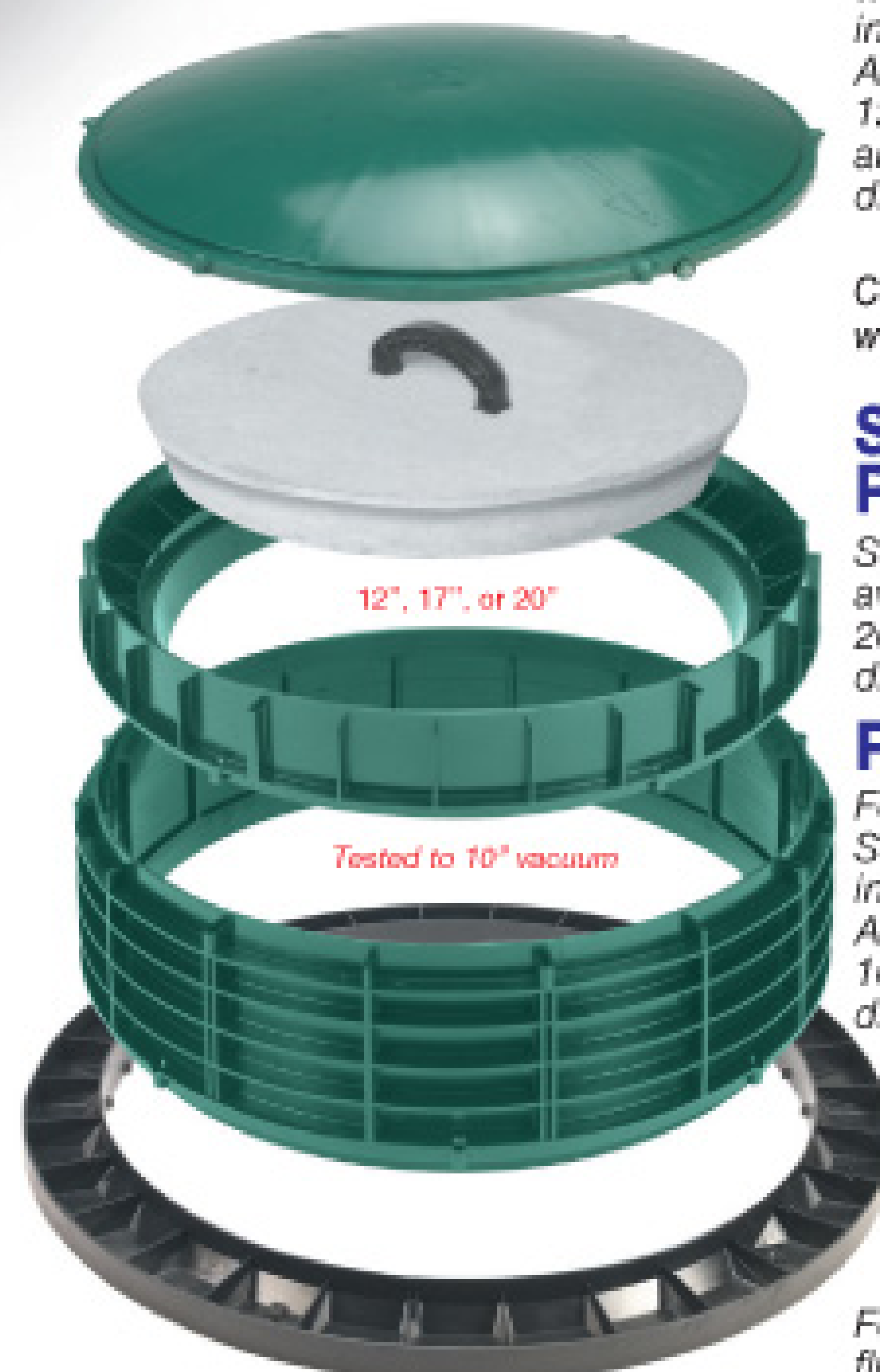
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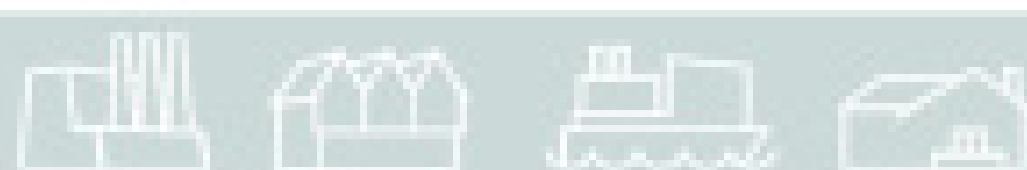
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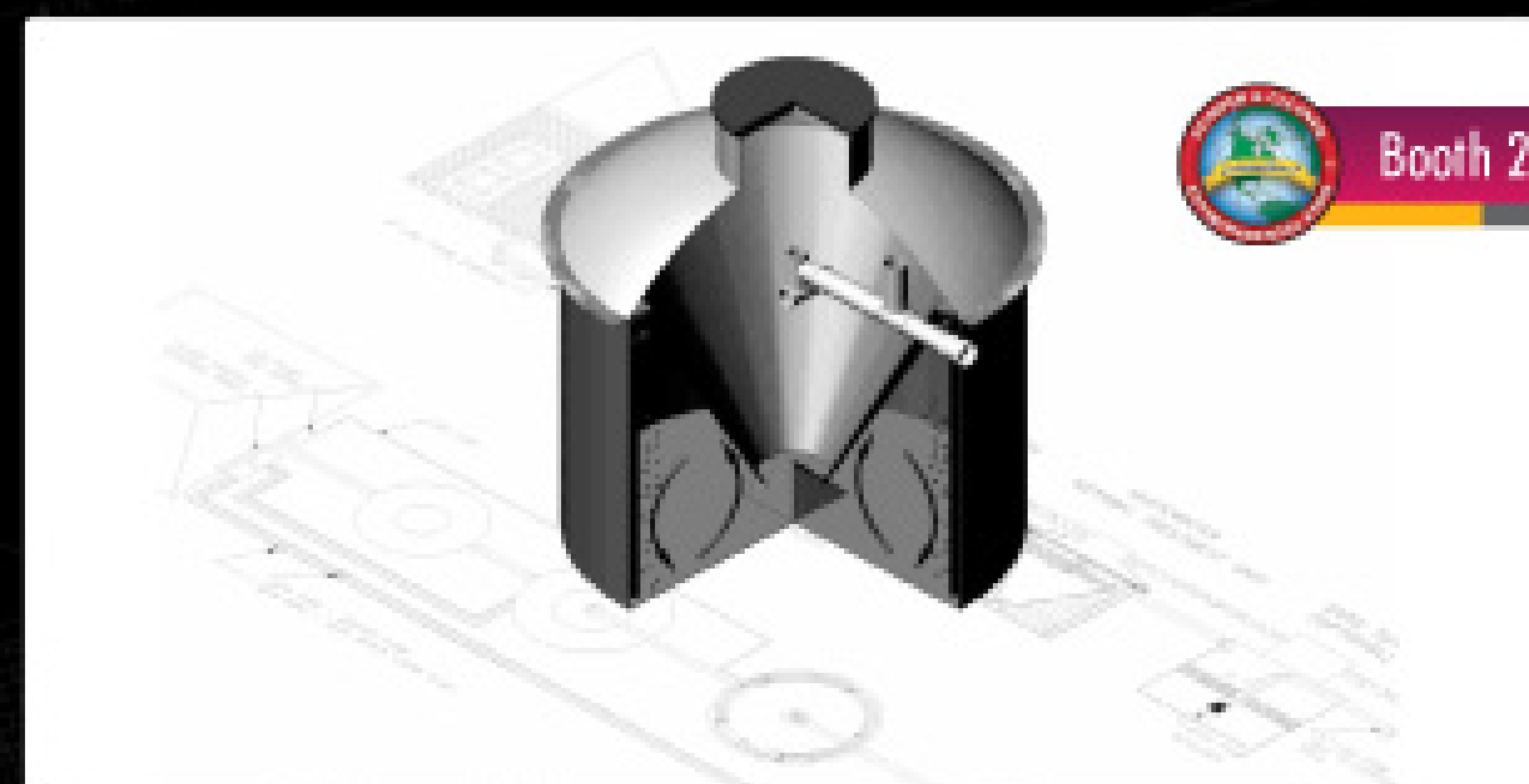
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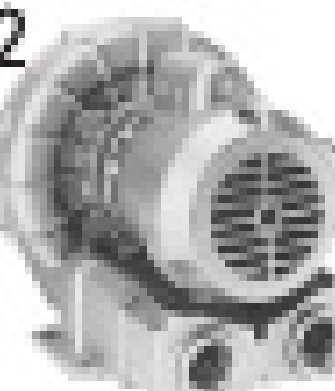
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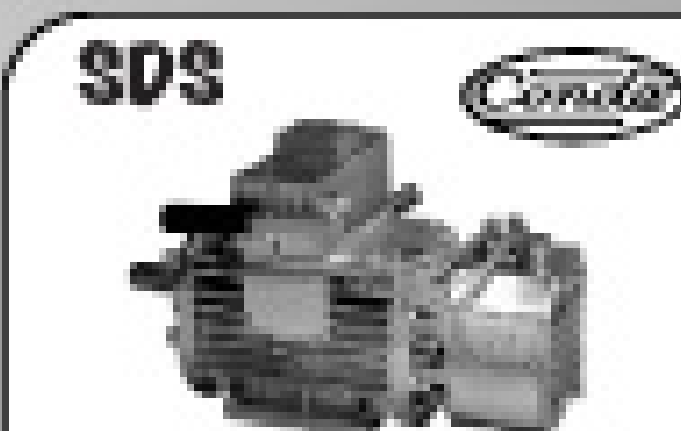


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Jim Bertucci and his son Jamie Bertucci of A-1 Services clean up a work area after installing a septic tank heater. (Photography by Debra Jensen)

Conquering Cold

A-1 Services uses simple and more complex methods to keep customers' septic systems from freezing in northern Minnesota winters

By Gil Longwell

A-1 Services Inc. Eveleth, Minn.

OWNER: Jim Bertucci

YEARS IN BUSINESS: 26

EMPLOYEES: 6

MARKET AREA: 60- to 70-mile radius

ANNUAL REVENUE: \$500,000

SPECIALTIES: Replacement systems, repairs, frost mitigation

AFFILIATIONS: Minnesota Onsite Wastewater Association



It gets cold — very cold — in northern Minnesota, where Jim Bertucci operates A-1 Services Inc. The company is based in Eveleth, about 100 miles south of International Falls and 60 miles north of Duluth.

"You may have noted that International Falls is usually the coldest place in the lower 48," says Bertucci. "And it's not all that much warmer 40 to 100 miles south." The company services septic systems and installs new systems for customers in a 60- to 70-mile radius.

Naturally, a key challenge for the business is to install systems that resist freezing — and to protect existing systems against frost that can penetrate deep and freeze septic tanks and underground piping. Bertucci's methods range from applying ground cover in fall to provide insulation, to installing heaters that protect tanks or drainfields.

His innovations with cold-weather systems embody his general approach to the business, which is to learn continuously and apply

new knowledge and new tools to help solve customers' problems.

Small yet innovative

A-1 Services was born in 1981, when Bertucci bought a vacuum truck from a plumber friend. "When I started this business, I knew nothing," he says matter-of-factly. By learning from his peers, Bertucci avoids common pitfalls and achieved success.

"Almost immediately, we got into repairs and installations when our pumping customers needed these additional services," Bertucci says. The company installs about five onsite systems in a typical year. While that number is small, it does not signal a diminished commitment to quality installations or innovative technology on the part of Bertucci and his four employees.

A-1 Services was the first company in the area to substitute EZflow synthetic media for traditional rock aggregate. "You don't have to be a big business to use the most advanced technologies or techniques," Bertucci says. He has

installed Ecoflo and Bord na Mona peat systems and is working to become qualified to install Orenco advanced treatment systems.

Bertucci's son Jamie and employee Jamie Metcalf are full-time vacuum truck operators. Bryan Sampson helps with onsite installations. Sam Leatte delivers, services and maintains the company's fleet of more than 200 portable restrooms. In the office, Mary Johnson interacts with customers, orders supplies, and keeps the books.

"You don't have to be a big business to use the most advanced technologies or techniques."

Jim Bertucci

Changing weather

Bertucci is a keen observer of weather and how systems perform in varying conditions. In two of the last four years, unseasonably warm weather during and just after snow-

falls has changed some "truths" about how septic systems operate in cold climates.

"It's not that the systems behave unexpectedly; it's that we have seldom seen these conditions and have not yet fully developed strategies to offset their impacts," Bertucci says. The winters remain



Jim Bertucci installs a stock tank heater in 1,000-gallon septic tank. (Photo courtesy of A-1 Services)

quite cold, but short duration changes in temperature in winter have prevented establishment of the long-familiar November to March snow-covered landscape. "It is the loss of snow cover that has caused onsite wastewater system components to behave understandably different," Bertucci believes.

"Snow is an insulator that protects all that lies below from drastically colder air temperatures. Snow keeps the ground from freezing more than a few inches below the soil surface." Without a snow blanket, or when covered by an ice sheet, the soil freezes to greater depths.

In a typical snow-covered year, about 15 calls about frozen pipes were the norm. With bare ground, the frost effect generates as many as 60 calls a day. "Homeowners call seeking solutions for problems we seldom encountered in the past," Bertucci says.

Freezing deeper

In the past, frost-related failures followed a pattern. The calls started in late January, when frozen effluent delivery lines topped the list. Company technicians jetted these with hot water, sometimes repeatedly, to get them flowing again.

With bare or ice-covered ground, Bertucci has seen building sewers and effluent delivery lines frozen solid. "The pipe was encased in frozen soil, which protected the pipe from bursting when the water in it froze and expanded," Bertucci believes. Without the snow cover, the frost-related problems go deeper, and the solids and liquids in septic tanks and the liquid in pump tanks freeze too.

Although the arriving effluent brings a modest amount of heat energy, it is not enough to keep pipes and tanks ice-free. Liquid in tanks freezes from the top down. The first negative effects are seen at the inlet, where arriving material begins to accumulate on the ice surface, then freezes. If the baffle does not immediately clog, the liquid fills the space above the ice surface and begins to back into the building sewer. All too soon, the entire building sewer is filled and the homeowner has a backup.

As the liquid surface in a pump tank freezes, it disables the floats, which can no longer energize the pump. While the pump may remain surrounded with liquid, it never gets the call to turn on. The water level rises until the effluent delivery line from the upstream tank fills. Whether that pipe or the upstream tank freezes matters little, as the effect on the homeowner is the same.

Seeking solutions

This pattern of system behavior has sent Bertucci and colleagues to discussion tables and workshops. Bertucci believes he is seeing micro-climate changes related to temperature and precipitation.

"I am not a believer in global warming except as a continuation of natural cycles that have been going on for thousands or millions of years," he says. "If we see a transition from short-lived, sporadic occurrences to long-term changes, the industry will have to make



Jamie Bertucci installs a septic tank heater.

Seeking Regulations

Minnesota's onsite regulations are silent about considerations for frozen ground. Jim Bertucci, a 10-year member of the St. Louis County Technical Advisory Committee for onsite systems, says that group, the state Department of Pollution Control Subsurface Wastewater Committee, and the University of Minnesota Extension Service have all met several times to discuss ways to diminish the effects of freezing soil.

In advance of proposed regulations, discussions have centered on the application of urethane or other hard foam

insulation to tank exteriors. Another idea is to use insulated pipe for the effluent delivery line following a pump. Other suggestions include placing rigid sheets or blankets of insulation over pipes, tanks and other components before they are covered with soil. New approaches to heating individual components or the entire system are being discussed.

Whether or not the regulations change to address new installations, creative and effective solutions to new problems affecting old systems will be found, Bertucci says.

significant changes to system design, installation, management and operation." Whatever causes the changes, their effects must be understood and abated.

Bertucci sees two pressing questions: How to protect existing systems from freezing conditions that penetrate deeper into the ground, and how to design and install new systems to offset these same conditions. Meetings among installers, designers, and regulators are ongoing. The service providers have also looked beyond the onsite industry for insights and technologies to borrow and adapt.

Farmers, dealing with frozen drinking water supplies for animals, simply install a stock heater in the clean water supply tank. This submersible heater is installed before the freeze sets in. Bertucci has installed these in frozen septic tanks by chipping a hole in the ice and inserting the heater through the hole. "That's a lot of extra work that could have easily been avoided," he says.

He quickly discovered that the idea would work well, but because the constituents of sewage attack the heaters, they need to be redesigned for service in septic and pump tanks. These heaters bring maintenance and service opportunities, and they increase the owner's operating costs. Rated at 1,500 watts, they typically run continuously from late January through early April.

What about the pipes?

While immersion heaters keep tanks from freezing, they do not prevent freeze-ups in small-diameter delivery pipes, distribution laterals or manifolds, which may lie just a few inches below the soil surface. Therefore, Bertucci has retrofitted some systems with a device called the Septic Heater, developed in the cold climate of northwestern Minnesota, and sold by Septic Heater Co. of Gully, Minn.

Like the submersible heaters, this device operates around the clock. It heats air, which is distributed throughout the gravity piping network by a fan. A-1 Services has installed several such heaters, and the owners report satisfactory results. (The heaters are not suit-



Jim and Jamie Bertucci of A-1 Services use a waterjetter to thaw a frozen septic system line.

"I am not a believer in global warming except as a continuation of natural cycles that have been going on for thousands or millions of years."

Jim Bertucci

able for pressure distribution systems or in pump discharge lines.)

Some landowners have warded off freezing by applying several inches of straw placed on the ground above the absorption area. "A layer as much as 6 inches thick has been shown to have an effect similar to a snow cover," Bertucci observes. "If you don't have snow, straw is a good substitute. If the straw is applied too early in fall or left in place too long in the spring, the underlying grass may be harmed.

Solving problems

The words "triage" and "septic" system are not often used together, yet triage is the word Bertucci uses to describe his approach to call response, and then to whatever situation he finds in or on the ground.

He requires first-time customers to know with certainty where the treatment tank and absorption area are located. "When the ground is frozen for miles around, probing to find subsurface features is not an option," he says. "When the ground is frozen, we dig as little as possible." In some cold climates a backhoe is equipped with a frost hook to break through the concrete-

hard frozen ground. After that, a traditional bucket can be used.

Every task — installation, pumping, or thawing a system — requires the right tools and equipment. A-1 Services owns a John Deere 310 loader backhoe and a New Holland LX665 skid-steer, both well suited to cross-over applications for installation and repair. These are supplemented by four Chevy pickups and a 2003 Ford E250 service van.

To tackle frozen systems, A-1 crews can select from four jetters, including a Harben DTD 4016, two

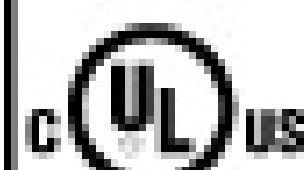
General model 3000 units with hotbox attachments, and an Alkota 4,000-psi hot water jetter.

As changing conditions create new headaches for homeowners, Bertucci is most often found in or near a vacuum truck, a backhoe or at a meeting, working to address his customers' traditional and unconventional needs. It all starts with careful observations, which gel into conclusions that lead to solid approaches that meet the new challenges Mother Nature brings to this industry. ■

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This feature in Onsite Installer reports noteworthy conversations that take place in Installer Discussion, an e-mail based forum for industry professionals sponsored by COLE Publishing. Installer Discussion enables exchange of information and ideas on a wide range of topics related to onsite wastewater treatment. To find out more about Installer Discussion, or to subscribe, visit www.onsiteinstaller.com.

Debating Fabric

Installers share ideas on the use of fabric to exclude soil from chambers in onsite treatment system installations

Question:

We started using chambers about eight years ago. Our soils are mostly loam. We have used fabric over chambers for three years. About four years ago, when we went back to check a chamber system we had installed a year before, we noticed the chambers were about one-third full of silt.

We had walked this field down carefully when we installed it. We used a laser and held to a tight tolerance on the trench. We believe there is no way the silt came in from the bottom — it had to come in through the louvers. After some research and trials with other options, we started using fabric over all our chamber systems. Does anyone know of any independent studies on fabric use on chambers?

Answers:

➔ I've installed a number of chamber systems and have had no problems with overburden infiltration. Your situation sounds like one that an engineering firm technician friend described to me. He told of a chamber system that had been installed and in use for a while. When they opened it up, they found the "bottom had welled up" to fill almost one-third of the space. This was clearly some sort of expansion of the material as there was no subsidence of the overburden and

no sinking of the chambers.

The engineer friend has seen a phenomenon that meets your description. He didn't have an official name for it but "swelling of the soil" would probably suit it. He was at an installation where I was adding a pump chamber to a conventional septic system. It was a 250-gallon tank and lift station installed about six feet from the septic tank.

The ground was damp, silty gravel and at least a little elastic. I dug it to grade, then lowered the tank into position. We shot the top of the tank and found it was about 1 inch high. I pulled it out, cleaned up the bottom of the hole, re-shot the hole bottom, rechecked our figures, and reset the tank. It was about 1 inch high. The result was the same a third time.

Our calculations and digging were right on — the ground was simply rising up each time. We finally set the tank on the bottom (once again it was showing slightly high) and backfilled it recognizing that nothing we did to the bottom of the hole changed the hole. We shot the finished tank and it was on grade.

As for covering chambers with fabric, only time will tell. One of the flags I see there is laying the fabric out, then covering it. If the fabric is not contoured to the chambers, it will bridge low areas and eventually sag, give way and create subsidence.

Information that I have suggests the issue is soils expanding or rising

inside the void rather than infiltration through the chamber louvers. Certainly the addition of water into the uncompacted and unpressured surface protected by the chambers would allow for a natural absorption and expansion that is not possible in soils under pressure. I would consider all soil under rock-and-pipe beds and the ground-contacting surfaces of the chamber area to be under pressure and not likely to expand.

There is nothing technical in my comments — just down-home, blue-collar observation based on experience, and some hearsay from a trusted friend. There's a lot more work to be done on studies to prove or disprove observations installers make.

➔ I install chambers and we use filter fabric. In chambers without fabric that we have installed, we have seen infiltrated soil in them. I just assumed it got in from the expansion and contraction of the soil.

➔ Your ground conditions sound similar to what we have in the Fraser Valley of British Columbia. We are on a floodplain, through which the Fraser River runs. When the river is high, we get what we call boils, where an excavation, even a shallow one, can weaken the ground in that spot and allow the groundwater a means of escape. So you dig for a while, and then you see a bit of seepage, then bang, the hole is full of water. Perhaps it's a similar

hydrostatic pressure that is pushing the soil up into the chambers.

➔ I have replaced two systems on loamy sand where chambers were installed four years ago. Company authorities were there when we dug it up. The sand seemed to come in from the louvers on the sides. You could actually see the layers coming through the louvers. On the brand I use, the company has changed the way they make them. Louvers are slanted more to the outside. I use fabric, but only in sand. Two-thirds of my systems are in clay, and we walk the sides in. Indiana rules use bottom area only.

➔ When I prepare a set of plans for a septic system, I generally will show a non-woven fabric over the chambers. There are a few very light ones available. I include inspection ports in the chambers and, if the seal is left loose, air can enter and exit through them. I generally pressure dose every drainfield and configure the force main to blow fresh air into the field each time the pump is activated.

➔ All I can tell you is that what works best to stop soil (heavy geotextile fabric) also works well to prevent air from getting in. That is intuitive. Prove it to yourself. Lay a piece of fabric out in your flower bed, and cover it with a couple of inches of soil or mulch. Better yet, try several different weights of

fabric in different locations.

The heavier material will prevent fines from penetrating, but will stay moist for long periods of time. And, most of the time, the wet fabric loaded up with wet fines will keep the soil beneath moist and anaerobic for long periods of time.

Of course, the lighter-weight fabrics may provide a compromise between the two objectives. Now, remember that the solid plastic portions of chambers also do not allow air or water to pass, shedding precipitation from the surface to the side louvers — which compounds the soil moisture problem. I suspect that this is less of a concern in dry climates than it is in colder and wetter climates.

➔ I can offer the perspective of a chamber manufacturer. I hope I speak for all manufacturers when I say we have the same goal as contractors and designers: We do not want systems to fail. Our aim is to produce a product that protects the public health.

There are many drainfield products on the market today that are filter-fabric based, and they have a proven field track record as long as they are designed, installed and maintained properly. Our company provides a filter fabric specification for contractors who wish to use it. It is not required, nor will it void the warranty if used.

When we went to provide a filter fabric specification, we researched companies that had experience a track record. Then we invited fabric manufacturers to give input and recommendations to help us select the best product available. The result was the thinnest and lightest material available. A 0.3-ounce, non-woven fabric addresses many concerns, including the need to provide oxygen and to provide the necessary bridging upon backfill with very fine, uniform sands.

Testing has been completed with wastewater (it was limited), and within a test cell (large Plexiglas box). The fabric specification is not something that we took lightly.

In general, the problem we have observed with intrusion through the sidewall has been limited to very fine, uniform sands.

In general, if a system is back-filled with this soil type, then fabric is not necessary. Part of the research included simulating a 100-year rainstorm in a test cell, with chambers installed in fine, uniform sand. No intrusion was observed.

Field research concluded that when sites are left open, possibly awaiting final inspection, and a strong rain event occurs, then very fine uniform sands can be mobilized. This is no ground-breaking research; I am sure that most of you are aware of this, and for that matter, any type of soil exposed to a heavy rain event will erode and carry sediment into a trench, regardless of product type.

So our specification is at the discretion of the contractor because we believe in their knowledge and experience base. Please understand that from our experience with tens of thousands of systems installed each

year, we do not have many system failures. Our reported failure rate comes in at a fraction of a percent.

Of the calls we do get, only a small number are intrusion-related. If I had to guess, I would say that I deal with three or four per year. (This response was submitted by Dennis E. Hallahan, P.E., technical director with Infiltrator Systems Inc.) ■

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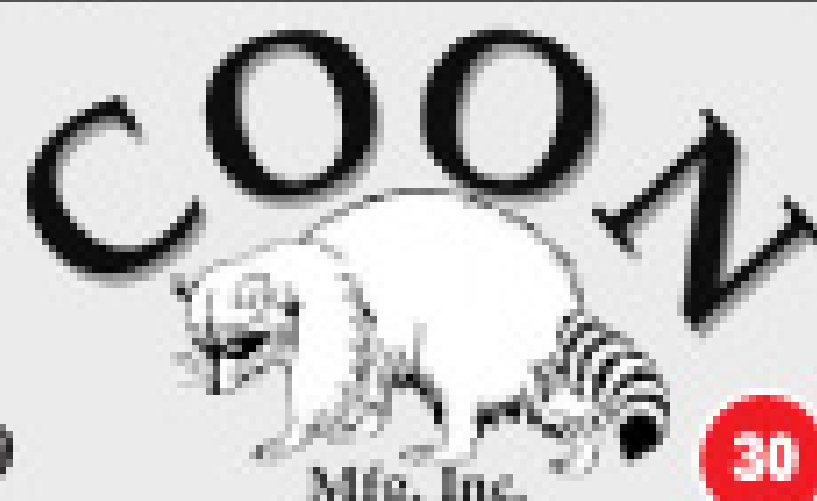
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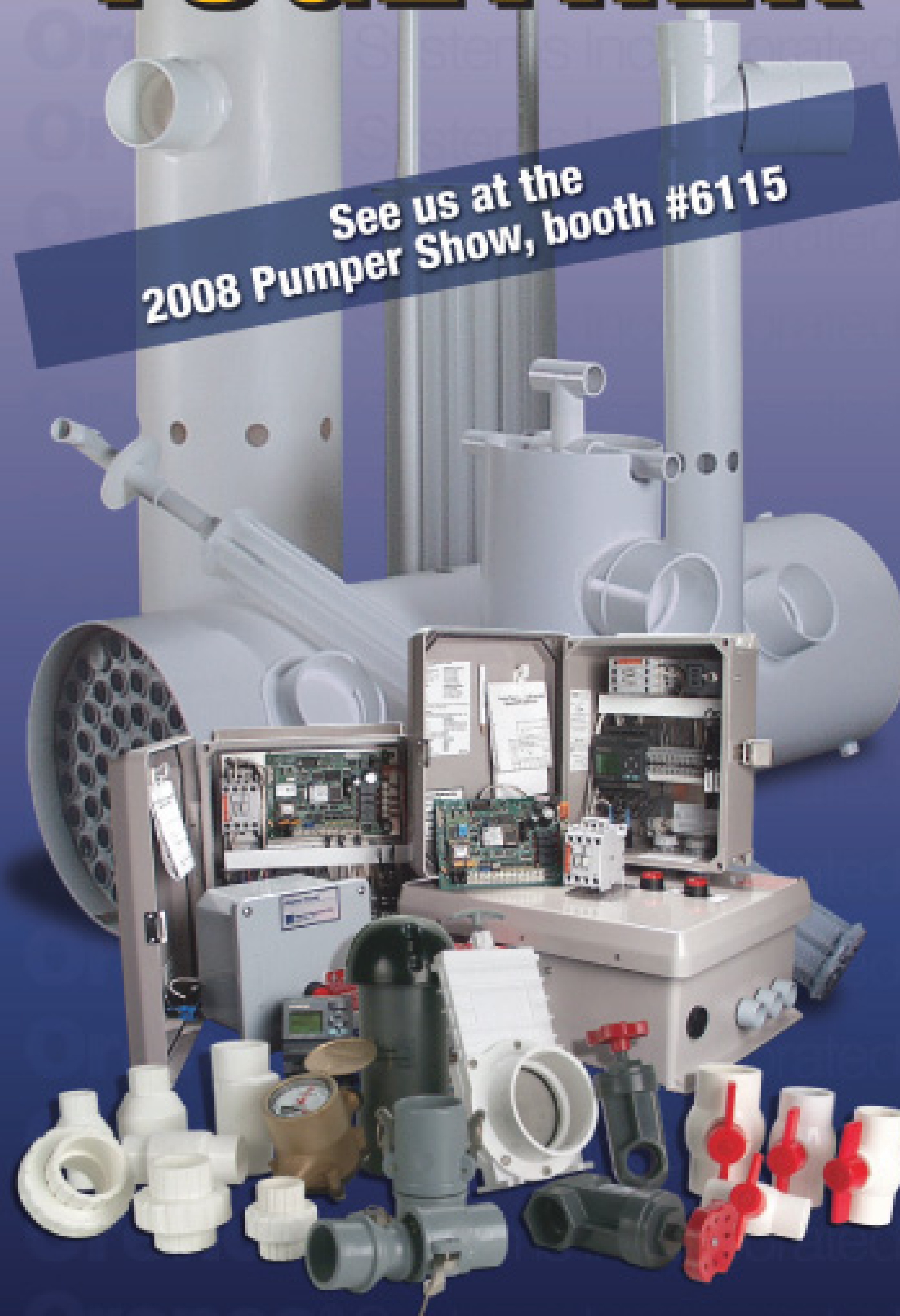
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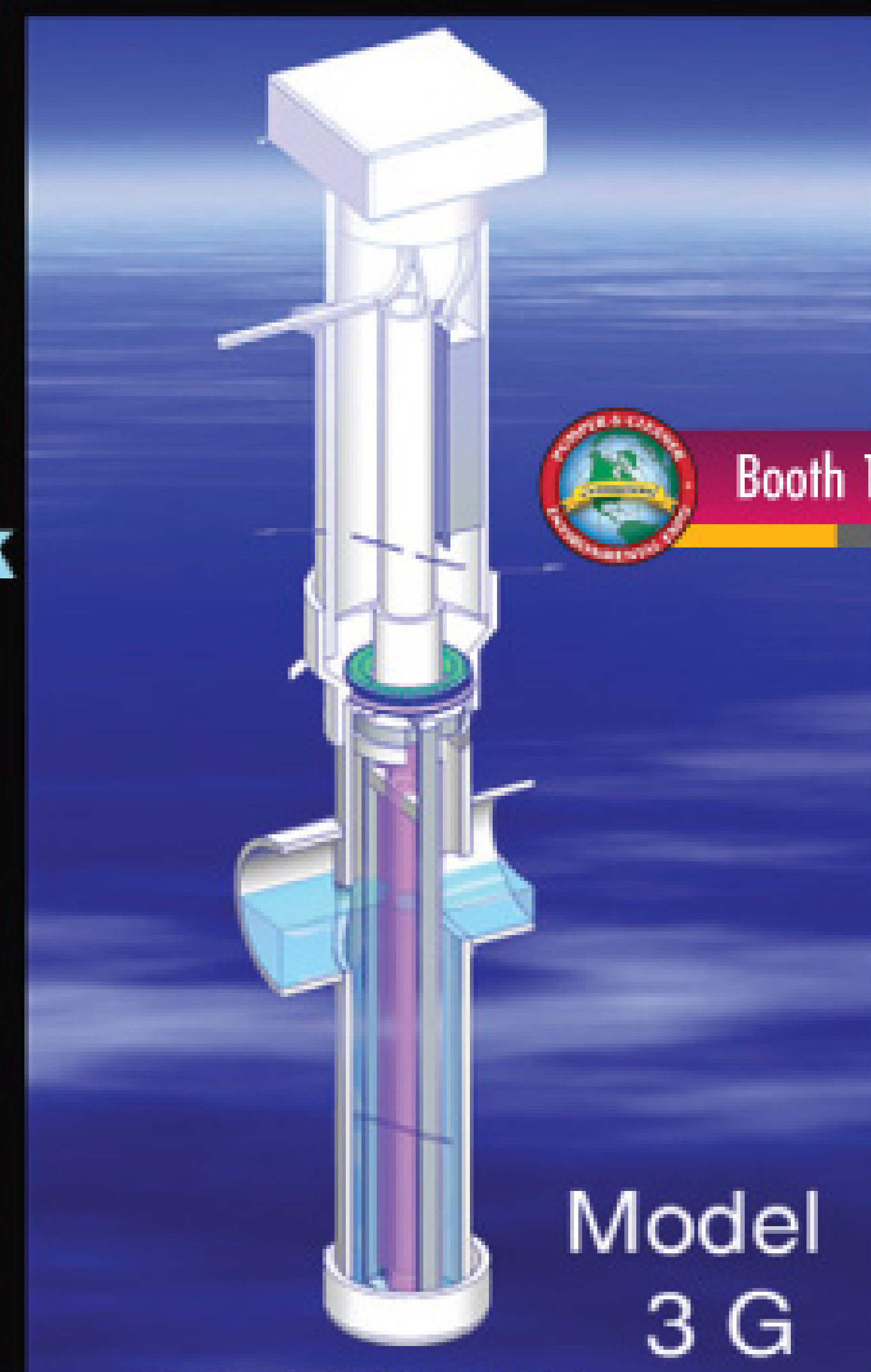


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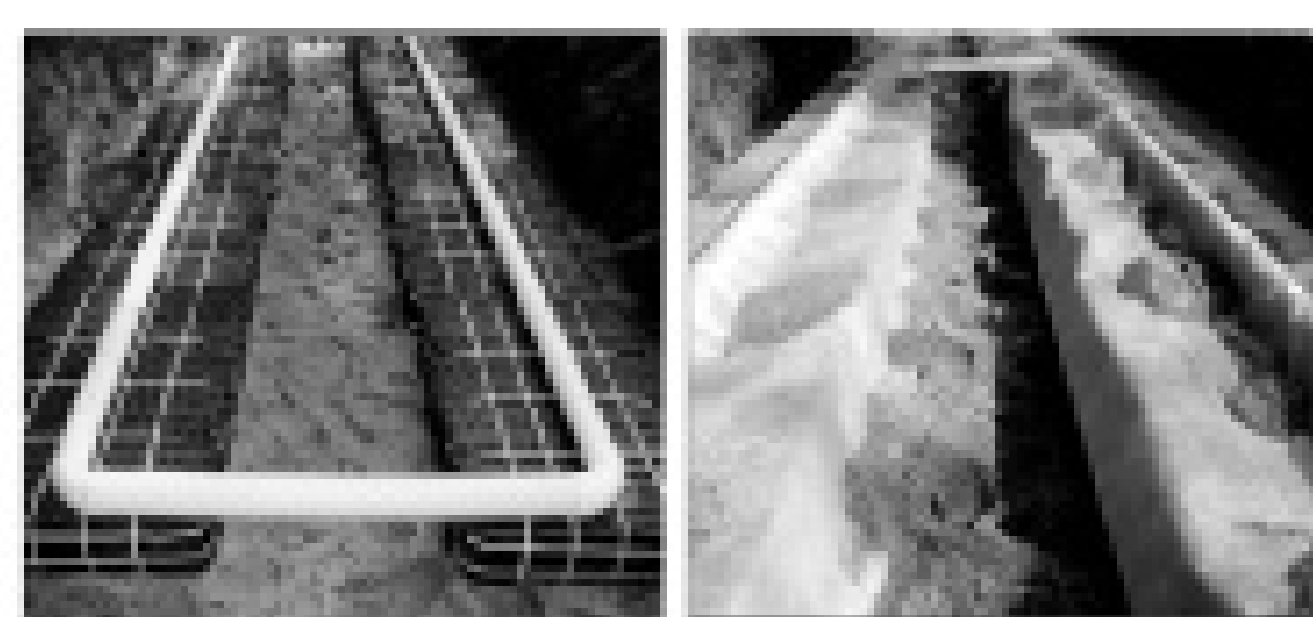
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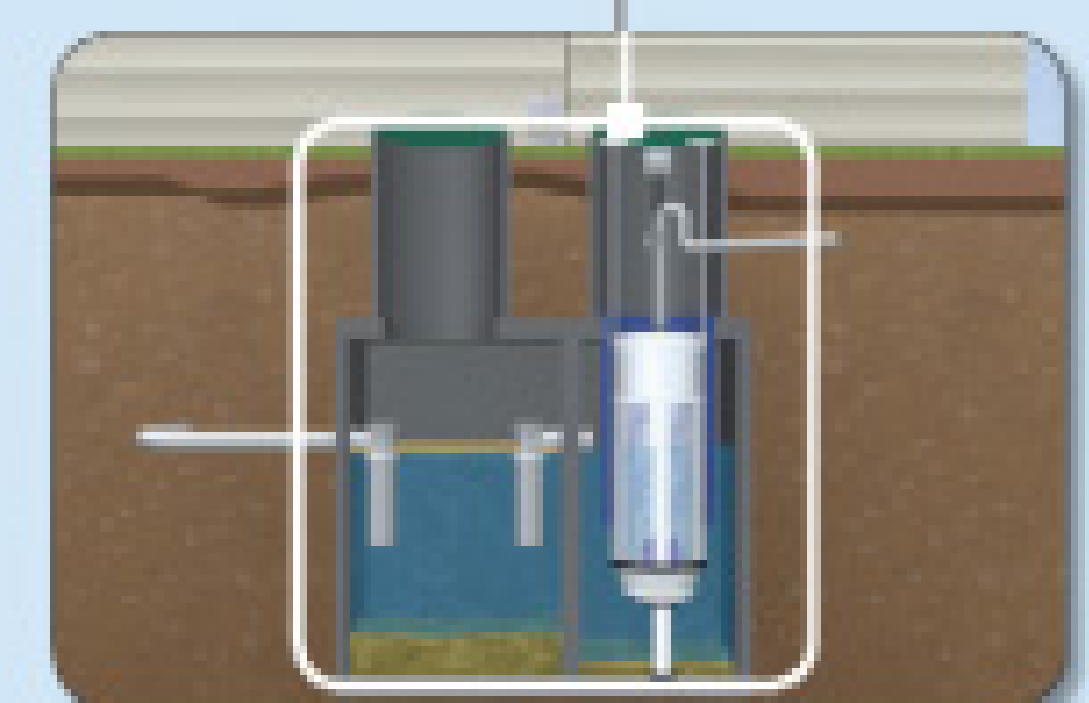


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Learning and Competing

Third Annual NOWRA Installer Academy draws 250 to Las Vegas for education programs and a national Roe-D-Hoe competition

By Gil Longwell

Two hundred fifty participants from all over the United States and Canada attended the Third Annual NOWRA Installer Academy in Las Vegas, Dec. 10-12. Many of them went "bucket to bucket" in the Roe-D-Hoe, held as part of the event. Education was the focus of the gathering, but when given the opportunity to climb on a machine and show off their skills, many could not resist.

The educational program was developed by the Consortium of Institutes for Decentralized Wastewater Treatment. Working with NOWRA and the National Environmental Health Association (NEHA), the Consortium seeks to establish and communicate a minimum set of onsite system installation guidelines. Training was offered in three tracks:

- The Consortium's basic installer course.
- An advanced track that builds on the basic course.
- A manufacturer track with detailed training that may lead to product-specific certifications.

Participants had the opportunity to take the written exam for the NEHA Certified Installer of Onsite Wastewater Treatment Systems national credential.

During the Roe-D-Hoe, held on a paved parking lot, professional installers showed a deft touch on the control stick. Competitors displayed their hand-eye coordination, patience and depth perception, using a spoon attached to the fork of a bucket to place a golf ball.

The Roe-D-Hoe winners were:

- First place: Bill Morton of Sure Fire Septic Maintenance, Big Fork, Mont.
- Second place: Rodney Rice of Simon & Associates, Blacksburg, Va.
- Third place: Jeff O'Risky of O'Risky Excavating, Evansville, Ind.

Winners were selected based on the time it took to complete a series of three events in a course developed by J.R. Inman of Northwest Cascade in Puyallup, Wash.

In addition to bragging rights for a year, the winner took home a championship belt buckle sponsored by Concrete Sealants of Tipp City, Ohio, Howard Wingert, president, and \$1,000 donated by Stonebridge Construction and Northwest Cascade, both of Washington. NOWRA president Raymond Peat, Bio-Microbics Inc., told the crowd before the award ceremony that the belt was fabricated "using the same skills, methods and materials as the belts bestowed by big time wrestling promoters." ■

Jerry Stonebridge, NOWRA president (left), and K.R. "Trapper" Davis, NOWRA board member (right), award Bill Morton of Sure Fire Septic Maintenance, Big Fork, Mont., the championship belt for winning the Roe-D-Hoe competition. (Photo by Raymond Peat)



J.R. Inman of Northwest Cascade in Puyallup, Wash., judges the control skills of Mark Shepard of Utilities Excavating Inc., Overland Park, Kan., during the Roe-D-Hoe competition at the Third Annual NOWRA Installer Academy in Las Vegas. (Photo by Gil Longwell)



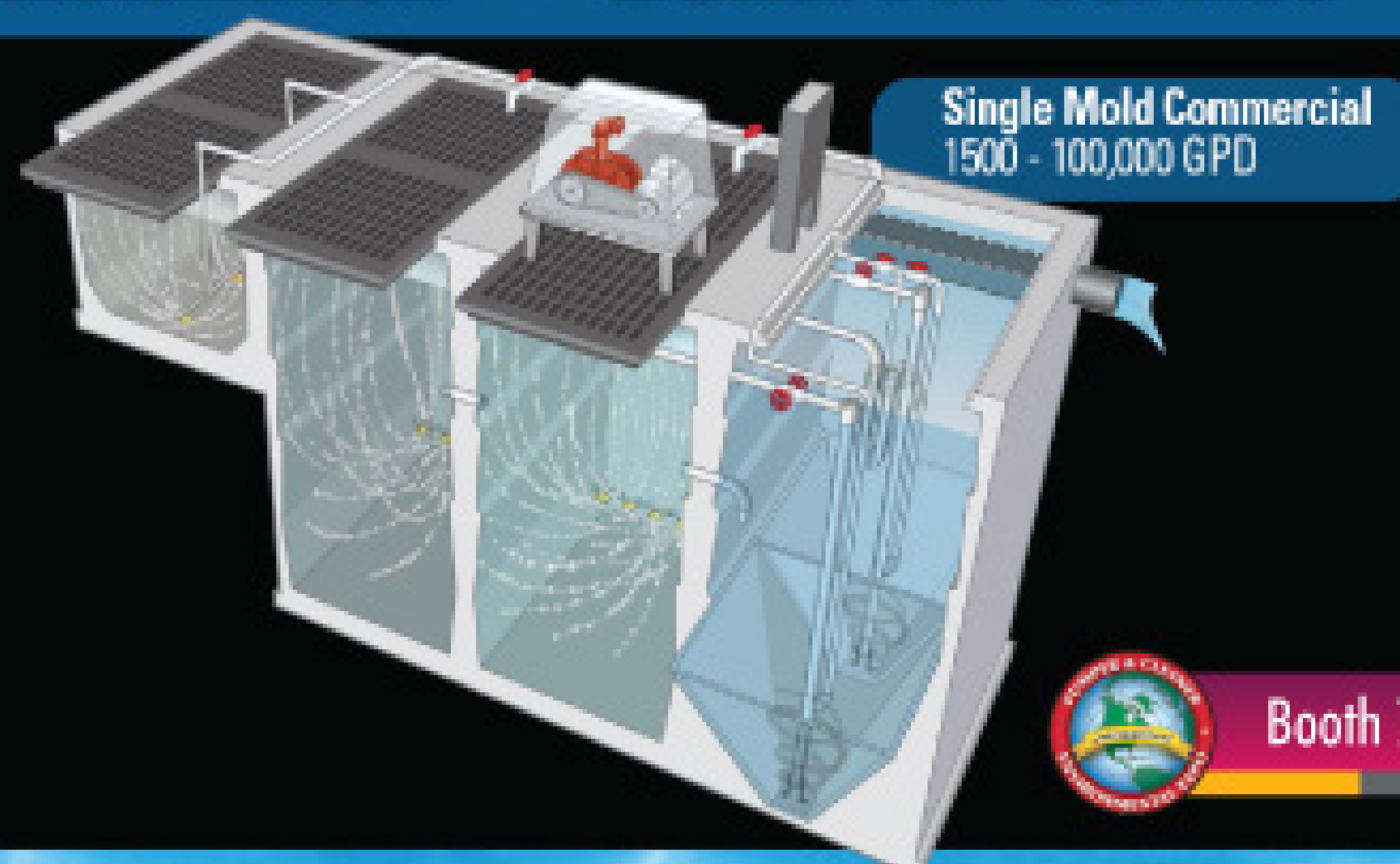
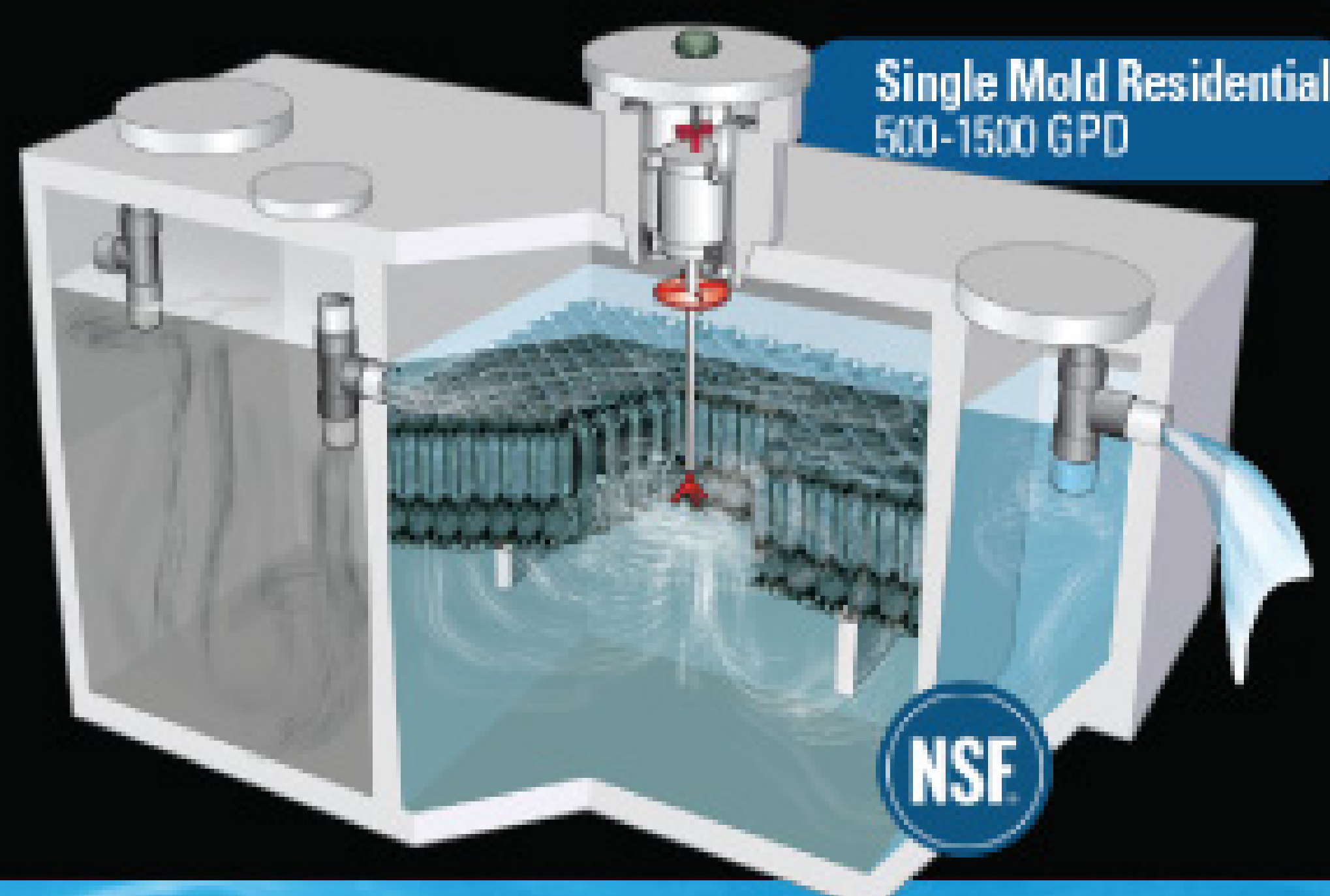
A spoon attached to the fork of a bucket tested the ability of competitors to precisely place a golf ball. (Photo by Gil Longwell)



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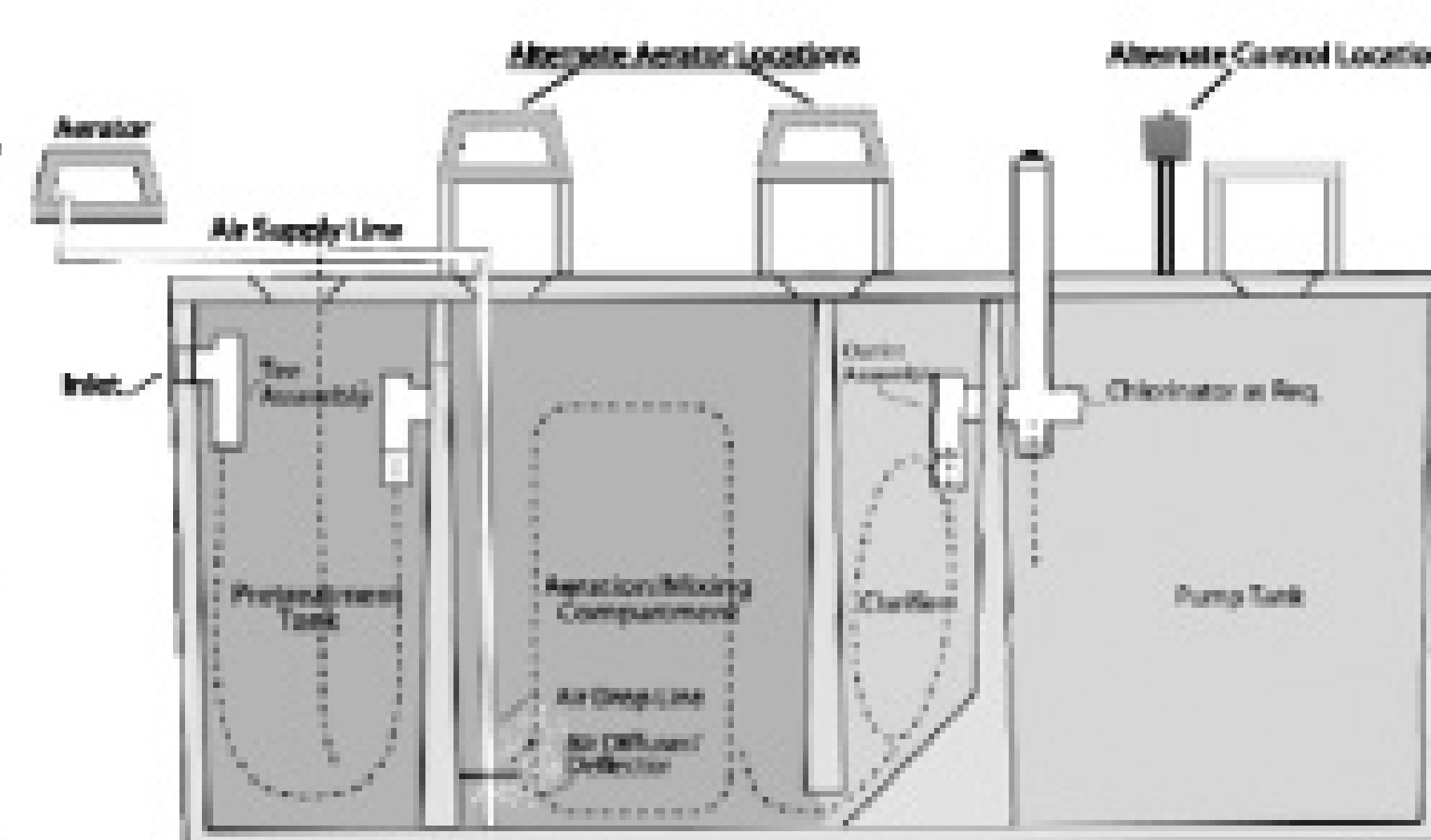
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Redeeming Grace

A biological remediation process saves a Georgia family from replacing a failed gravel drainfield

By **Scottie Dayton**

Sewage surfacing from a 25-year-old gravel drainfield and odors from the septic tank alerted a family in Greensboro, Ga., to a potential health hazard. The family had just installed an irrigation system and sodded the lawn, dotted with mature trees. They needed an affordable onsite solution that did not disturb the area.

The soil report stated that shallow rock would prohibit a conventional drainfield. The couple called Infiltrator Systems Inc. in Old Saybrook, Conn., to assess the problem. Jim Free, senior representative, and Matt Vinson, area representative, determined that an excessive biomat was causing the ponding.

"Repairs would involve digging up the concrete driveway and installing a pump system to lift wastewater to a very shallow drainfield at the top of the property," says Vinson. "The other option was a drip system. Neither was an

efficient solution."

In June 2007, the homeowners decided to remediate their existing system. After researching technologies, they selected an aerobic bacterial generator (ABG) that resolved their wastewater issues within two weeks without disrupting the yard.

Soil conditions

Soils are sandy with unsuitable absorption rates. Soil series are Poindexter and Prosperity. The depth to seasonal high water table for the Poindexter series is 48 inches; for Prosperity, 18 to 30 inches. The four-bedroom home sits on one acre with a 15-percent grade from the back yard. The only suitable area for a replacement drainfield was a 30- by 60-foot section of sandy loam near the street, but that was too small.

System components

Based on the number of bed-



Brian Parker guides the Aquaworx Remediator into the septic tank. It must sit firmly on the bottom and below the riser for easy access. Matt Vinson looks on. (Photos courtesy of Infiltrator Systems Inc.)

rooms, the system is designed to handle 500 gpd. Its major components are:

- Existing 1,000-gallon, single-compartment concrete septic tank.
- Existing drainfield with 200 feet of gravel trench.
- Aquaworx Remediator from Infiltrator Systems Inc.

System operation

The ABG is a 36-inch-high by 15-inch-diameter airlift column inserted into the septic tank. Cusped plastic wrapped around the bottom outside of the unit and

placed within and above a bubble diffuser provides the surface on which introduced proprietary bacteria colonize.

The unit has a 1/2-hp air pump with built-in alarm that supplies air through a 1/2-inch PVC Schedule 40 line discharging at the bottom of the column. Aeration circulates the septage and creates an environment that enables the microbes to digest organic waste and remove nitrate. More than 25,000 gpd pass around, over, and through the 150 square feet of plastic.

"Agitating the wastewater initially releases unpleasant odors that

System Profile

Location:	Greensboro, Ga.
Facility served:	4-bedroom home
Installers:	Brian Parker and Matt Vinson, Infiltrator Systems Inc., Old Saybrook, Conn.
Site conditions:	Sandy soils with unsuitable absorption rates
Type of system:	Aquaworx Remediator, Infiltrator Systems Inc.
Hydraulic capacity:	500 gpd



At left, Matt Vinson and Brian Parker prepare to install the air pump and its protective plastic basin. Below, a close-up of the aerobic bacterial generator at work five days after installation.



"Agitating the wastewater initially releases unpleasant odors that disappear after a day or two. A foam or bubbly floc may appear for a week or two, but that's normal and can be washed down with a hose."

Matt Vinson

disappear after a day or two," says Vinson. "A foam or bubbly floc may appear for a week or two, but that's normal and can be washed down with a hose."

As effluent flows by gravity to the drainfield, bacteria migrate with it to consume the clogging biomat and improve the nitrification phase. Increased hydraulic efficiency is noticeable within weeks. The remediator is not an advanced treatment unit.

Installation

Using shovels, Parker and Vinson dug down 2 feet to uncover the septic tank, removed the concrete lid from the inspection port, and retrofitted it with a 24-inch riser from Polylok Inc. The tank held the required minimum liquid depth of 38 inches, enabling the ABG to operate properly.

"We recommend pumping the tank if it has six or more inches of sludge and three or more inches of scum," says Parker. "Pumping allows a cleaner installation, but the disadvantage is waiting for the tank to refill before starting the Aquaworx unit."

After mounting the air pump's

waterproof basin under the outdoor deck near an electrical outlet, the men used shovels to dig a 20-foot-long trench 4 to 6 inches wide to bury the air line. "A depth of 8 to 12 inches is adequate," says Parker. "The aim is simply to hide it."

They lowered the ABG into the tank using the supplied rope. "The rope is made of non-reactive material because it stays in the tank and is used to remove the unit for future maintenance," says Parker. The ABG was positioned with the air-line assembly as close as possible to the riser's inside wall. Parker then bounced the unit on the bottom of the tank to seat it. "You can feel it settle," he says. "If improperly seated in a lot of sludge, the column begins to tip."

Because the unit merely sits on the bottom, the rigid air-line assembly added stability when glued in place. ABG installation took 30 minutes and the preparation about two hours. Within two weeks, the remediator restored the system to working condition with no signs of ponding at ground level. Complete restoration is expected in six months.

Maintenance

Infiltrator Systems holds the maintenance agreement. During the first three weeks of operation, a technician inspects accessible components for proper fit and function, and verifies solids levels and odor reduction in the septic tank. He also looks for ponding.

Six months later, the technician repeats the process, cleans the air pump filter, and inspects the basin assembly, septic tank riser, riser lid, and seals. The year-end inspection adds removal and replacement of the bacterial catalyst assembly to the checklist. ■

MORE INFO:

79 Infiltrator Systems Inc.
800/221-4436
www.infiltratorsystems.com

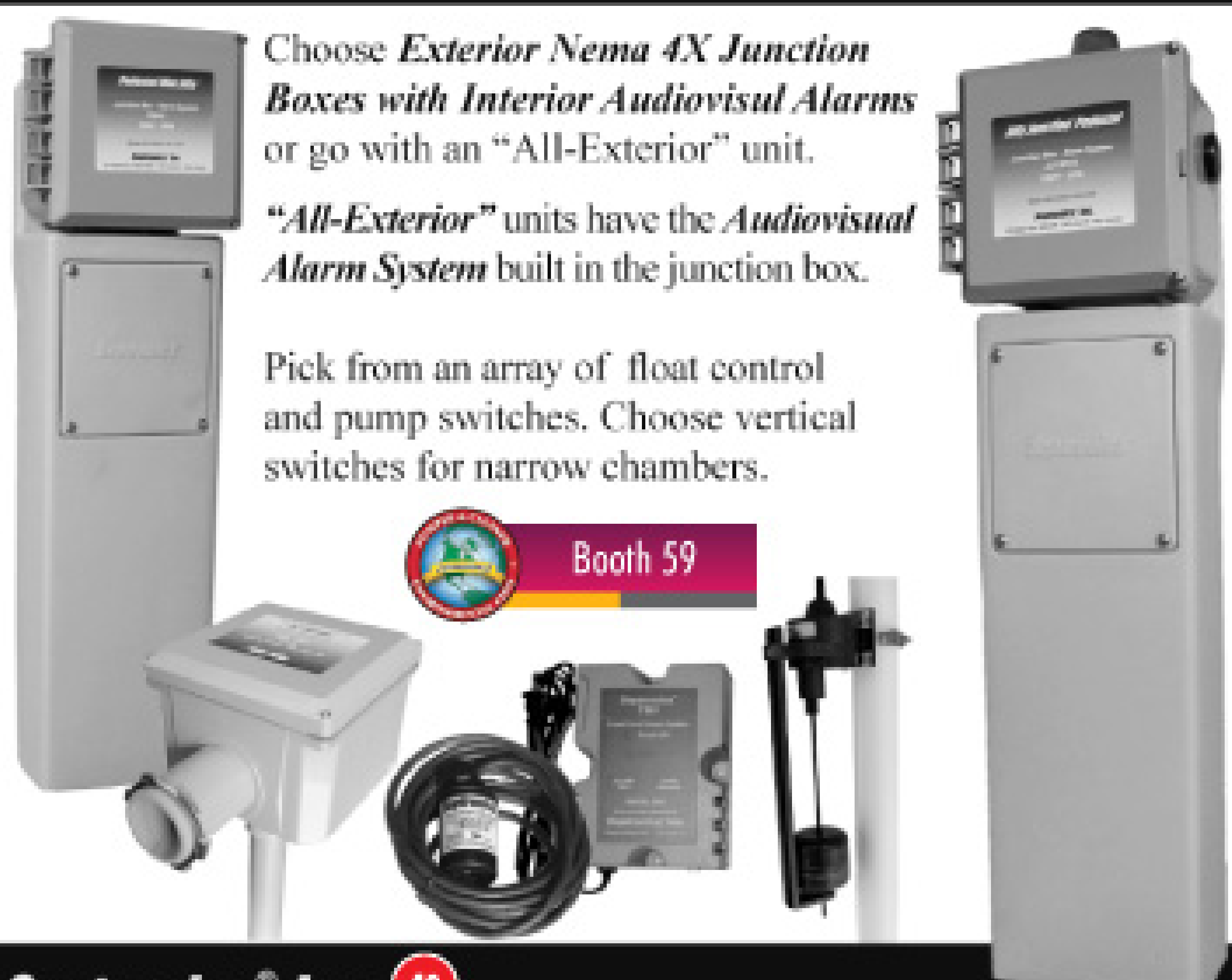
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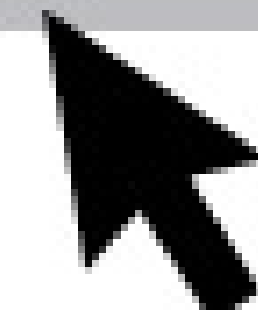
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Work Mate	4002, 4003
Worldwide Organics	20033
Xerox Corporation	4126
Zeeler Pump Company	87

February 2008

AlturnaMats Acquires Mobile Matts

AlturnaMats Inc. has acquired Mobile Matts of Green Bay, Wis. Phil Schounard will continue to head Mobile Matts and operate out of the Green Bay facility.

Vermeer Acquires Maxi Drill Manufacturer

Vermeer has acquired the operating assets of Horizontal Rig & Equipment of Conroe, Texas. HRE produces three drills with pullback forces of 500,000, 750,000 and 1-million pounds. Production of these units will be moved to Vermeer's Pella, Iowa, location with distribution through the company's global dealer network beginning in the first quarter of 2008. The drills will carry the Vermeer brand name. ■

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. You can submit your letter by:

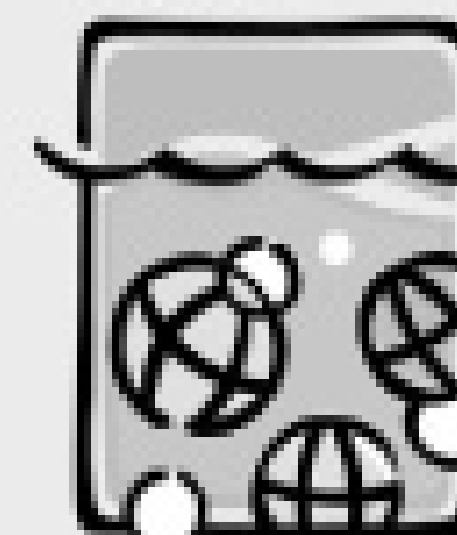
MAIL: Onsite Installer, P.O. Box 220, Three Lakes, WI 54562
FAX: 715/546-3786 ■ **E-MAIL:** editor@onsiteinstaller.com

All letters must be signed and limited to 500 words. We reserve the right to edit all letters for length and clarity.

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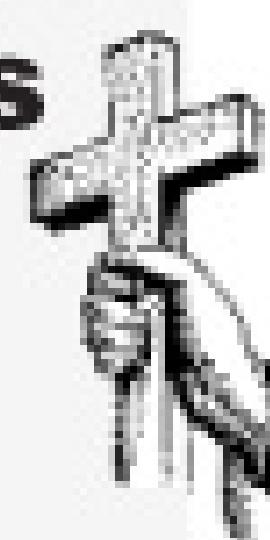
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Iowa Membership Rate Structure

The Iowa Onsite Wastewater Recycling Association membership has reverted to individual rather than company memberships. Dues include a membership to NOWRA, enabling members to take the Certified Installer of Onsite Wastewater Treatment Systems testing sponsored by the National Environmental Health Association. "Being able to sit for the exam was the reason we changed the membership structure," says president Bob McKinney.

Michigan Association Forms PAC

The Board of Directors of the Michigan Septic Tank Association has formed a political action committee to advance its goals. Committee members J.P. Fountain, treasurer; Chanin Frank, record keeper; Joe Hall, and Rick Throop are filing the papers and establishing a bank account for the PAC. The organization has a legal advisor and legislative lobbyist. Associations considering forming a PAC may contact Fountain at 231/796-3146 or Eloise@netonecom.net.

County Certification Testing

The Washington On-Site Sewage Association is working with many marine counties and some beyond to establish standardized certification testing, and is proctoring numerous tests for them. Testing is by appointment based on the schedule of the applicants. Tests are graded while candidates wait and an exam certificate is usually issued before they leave. WOSSA also notifies the county of the results.

The association has rewritten many of its training classes to include more hands-on activities based on responses from more than 2,000 class attendees in the last few years. Activities include assembling pressure distribution systems, start-up procedures, setting up timers and panels, and troubleshooting.

CALENDAR OF EVENTS

Feb. 13-14

Nebraska On-Site Waste Water Association Annual Convention and Trade Show, Embassy Suites Hotel, Lincoln. Call Diane Snapp at 402/476-0162.

Feb. 14-15

Utah On-site Wastewater Association Convention, E-Center, Murray. Call Judith Sims at 435/797-3230 or visit www.neng.usu.edu/uwrl/training.

Feb. 15-16

Wisconsin Onsite Wastewater Recycling Association Convention, Country Springs Hotel, Waukesha. Call 608/256-7757 or visit www.wowra.com.

Feb. 27-March 1

Pumper & Cleaner Environmental Expo International, Kentucky Exposition Center, Louisville, Ky. Education Day Feb. 27; exhibits open Feb. 28-March 1. Call 800/257-7222 or visit www.pumpershow.com.

March 2-4

Ontario Onsite Wastewater Association Conference, Deerhurst Conference Centre, Huntsville. Call 905/372-2722 or visit www.oowa.org.

March 3-5

Minnesota Onsite Wastewater Association Convention, Cragun's Resort, Brainerd. Call 888/810-4178 or visit www.mowa-mn.com.

March 11-13

Northeast Onsite Short Course, Marriott Hotel and Spa, Groton, Conn. 978/323-7929 or www.neiwpcc.org.

March 24

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

April 7-10

National Onsite Wastewater

Association Conference, Cook Convention Center, Memphis, Tenn. Call 800/966-2942 or visit www.nowra.org.

April 15-17

North Carolina On-Site Wastewater Treatment Conference, North Carolina State University, Raleigh. Call Joni Tanner at 919/515-1678 or visit www.soil.ncsu.edu, then Training, Short Courses and Workshops.

April 27-May 2

North American Society for Trenchless Technology No-Dig Show, Gaylord Texan Resort and Convention Center, Grapevine, Texas. Visit www.nodigshow.com.

May 12-15

California Onsite Wastewater Association Conference and Exposition, DoubleTree Hotel, Sacramento, Calif. Call 707/579-4882 or visit www.cowa.org.

TRAINING & EDUCATION

Vehicles Do Not Drive Themselves

A white paper from OSHA, *Guidelines for Employers to Reduce Motor Vehicle Crashes*, covers how to calculate the cost of motor vehicle crashes, examples of workplace driver safety programs, a 10-step program to minimize crash risk, and how to promote safe driving practices. It discusses what constitutes aggressive, distracted, and impaired driving and tells how to recognize signs of fatigue to prevent driving drowsy. Visit www.osha.gov/Publications/motor_vehicle_guide.html.

Effluent Pumps for Onsite Systems

The Sump and Sewage Pump Manufacturers Association is presenting "Effluent Pumps for Onsite Wastewater Treatment: Selecting the Right Pump for the Job," a non-credit training program on March 14 as part of the Illinois Plumbing Heating Cooling Expo at the Drury Lane Conference Center, Oakbrook Terrace, Ill. The program is in its certification stage and will become eligible for CEUs. Call Bev Potts at 800/795-7422 or visit www.ilphcc.com.

Florida

Courses are at the Florida Onsite

Wastewater Association's Training Center in Polk City unless stated otherwise. An asterisk indicates Master credit hours are available.

- Feb. 6 – 64E-6 Let's Look at the Code!, Hialeah
- Feb. 7 – 64E-6 Let's Look at the Code!, Tampa
- Feb. 11 – Artificial Media Treatment Technologies
- Feb. 12 – Natural Media Treatment Technologies
- Feb. 18-19 – *Master III- Basic Florida Soils
- Feb. 20-21 – *Master I- System Design & Function
- Feb. 21-22 – *Master II- System Materials & Regulation Requirement
- March 6 – *Master Contractor Maintenance
- March 11 – Onsite Systems: How Are They Approved?, northeast Florida (TBD)
- March 12 – Onsite Systems: How Are They Approved?, northwest Florida (TBD)
- March 25 – Work Smart, Not Hard, southeast Florida (TBD)
- March 26 – Work Smart, Not Hard, southwest Florida (TBD)

Contact FOWA at 407/830-4381 or www.fowaonsite.com.

Iowa

The Iowa Onsite Wastewater Training Center has the following courses:

- Feb. 20 – Basic 101, Storm Lake
 - March 17 – Basic 101, Calmar
 - March 27 – Media Filters, Indian Hills
 - May 14 – Drip Irrigation Dispersal Systems, Ankeny
- Call Annette Adams at 800/362-2127, ext: 6464 or e-mail Dennis Hayworth at dahayworth@dmacc.edu.

Minnesota

The University of Minnesota Extension has these hands-on workshops:

- Feb. 5-6 – Design-Continuing Education, Sauk Centre
- Feb. 5-7 – Design and Large System Combo, Continuing Education, Sauk Centre
- Feb. 6-7 – Cluster-Continuing Education, Sauk Centre

- Feb. 11-13 – Pumping/Maintaining, Grand Rapids
- Feb. 14-15 – General-Continuing Education, Detroit Lakes
- Feb. 21-22 – General-Continuing Education, Two Harbors
- March 11-12 – General-Continuing Education, Willmar
- March 14 – Contractor Safety/Pipelayer Certification, Continuing Education, Mankato
- March 25-26 – Pumping/Maintaining-Continuing Education, Brainerd
- March 31-April 1-2 – Introduction To Onsite Systems, Bemidji
- April 3-4 – Installing Onsite Systems, Bemidji
- April 11 – Contractor Safety/Pipelayer Certification, Continuing Education, Little Falls
- April 14-15 – General-Continuing Education, White Bear Lake
- April 16-18 – Designing Onsite Systems, Detroit Lakes
- April 22-23 – Inspecting Onsite Systems, Waseca
- April 28-30 – Introduction to Onsite Systems, White Bear Lake

Call 800/322-8642 (612/625-9797) or visit www.extension.umn.edu.

Missouri

Missouri Smallflows Organization is offering an Operation & Maintenance course on Feb. 19-20 at Hillsboro. The course provides CEUs to renew onsite registration with the Missouri Department of Health and Senior Services. Call 417/739-4100 or e-mail mso@lvbw.net.

North Carolina

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

- Feb. 14-15 – Onsite Wastewater System Inspector
- April 22-24 – Land Application/Biosolids Operator Training
- April 23-25 – Subsurface Wastewater Operator Training
- May 20 – Introduction to

Decentralized Wastewater, Fletcher

- May 21-22 – Onsite Wastewater System Inspector, Fletcher

Call Joni Tanner at 919/515-1678 or visit www.soil.ncsu.edu/training.

Pennsylvania

The Pennsylvania Septage Management Association is offering the following training on March 19-20 at Grantville:

- Vac-Truck Training and Certification
- Basic Onlot Wastewater Treatment System Inspection
- Advanced Onlot Wastewater Treatment System Inspection
- Standards Refresher

New Jersey Septage Management Association members qualify for PSMA member tuition fees. Call Jackie at 610/350-0590 or visit <http://psma.net>.

Washington State

The Washington On-Site 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 unless stated otherwise:

- Feb. 6-7 – Basics of Onsite Sewage, Centralia
- Feb. 14 – Construction Safety
- Feb. 20 – Basics of Maintenance, Port Angeles
- Feb. 28 – Design/Install Subsurface Drip Systems, Spokane
- March 5 – Markup and Profit
- March 13 – Control Panel Wiring
- March 19-20 – Exam Review
- April 2 – Maintenance Basics
- April 16 – Pumps
- April 23 – Design/Install Subsurface Drip Systems
- May 6-7 – Combined Basics of Onsite Sewage
- May 14-15 – Installation Basics, Part 2
- May 20 – Mounds/Sand Filters
- May 22 – Maintenance Basics, Bremerton

Call John Thomas at 253/770-6594 or visit www.wossa.org.

Wisconsin

Wieser Concrete has a 6-hour,

general continuing education seminar that provides the necessary credits for installers, sanitarians, designers, and others working in the onsite wastewater treatment field:

- Feb. 28 – Portage
- March 6 – Shell Lake
- March 13 – Fond du Lac
- March 20 – Wieser Concrete Maiden Rock Facility
- March 27 – Rhinelander

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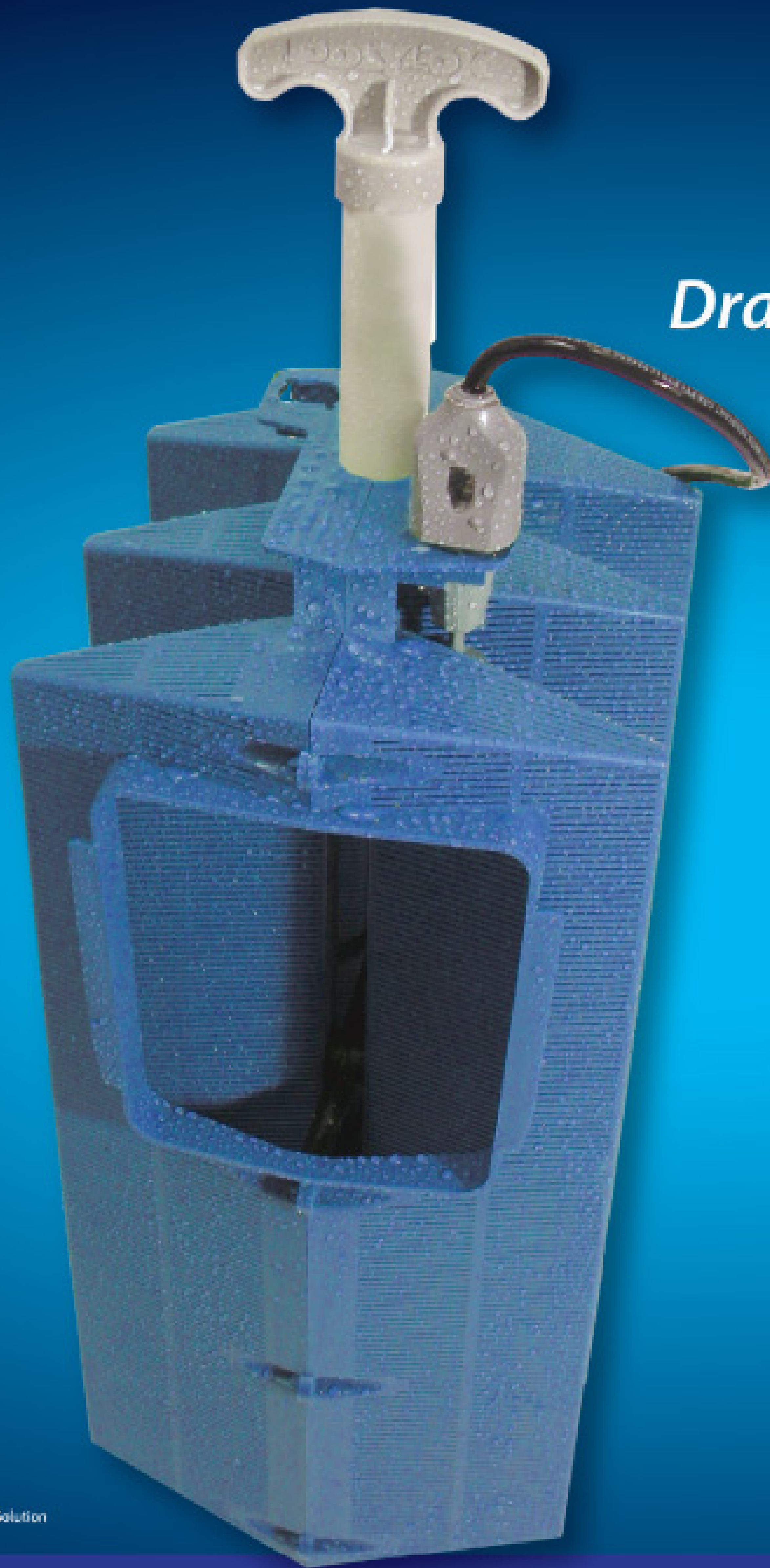
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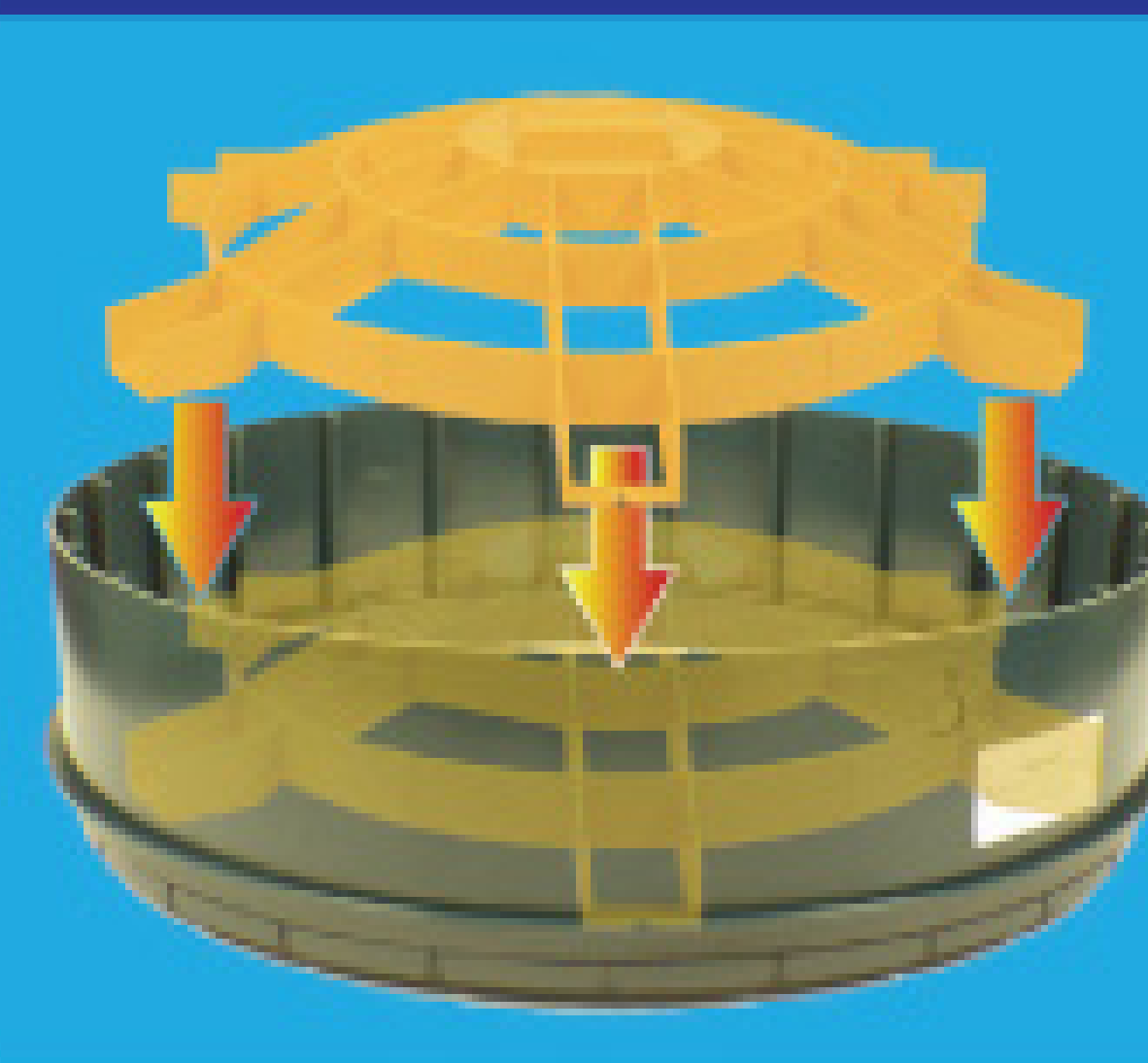
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