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2012



Fixing the RIGHT PROBLEM

Christman's Septic insists on a correct diagnosis before making system repairs **PAGE 10**



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ON THE COVER: Operations manager Dave Hummel and owner Gary Christman of Christman's Septic Service earned a reputation as problem solvers by performing thorough site investigations before recommending corrective action. (Photography by Harry Fisher)

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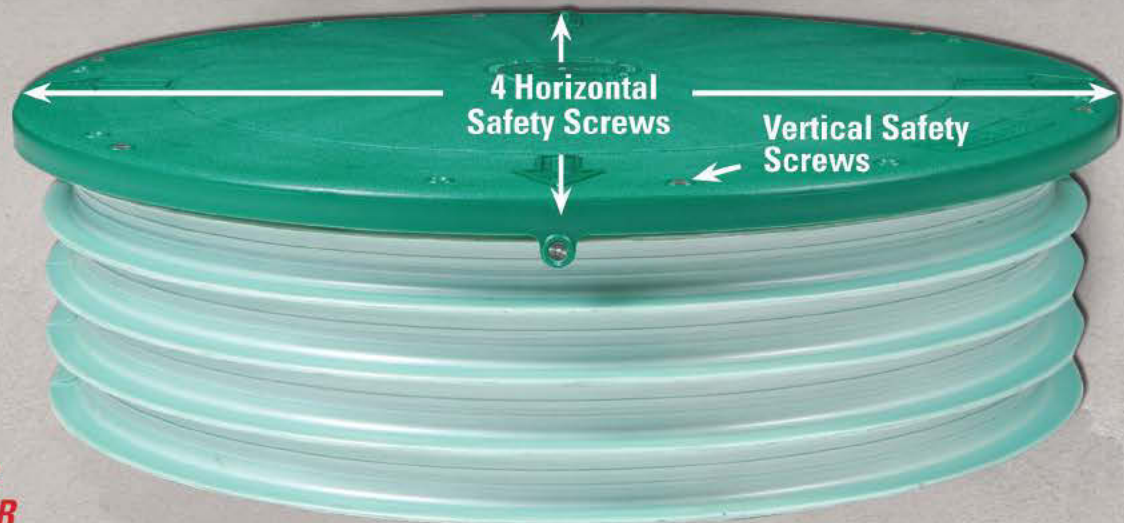
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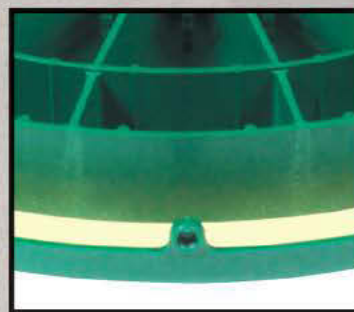
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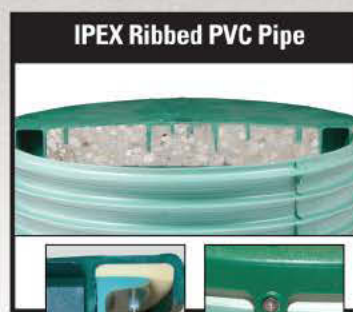
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Machinery Magic

The NOWRA Roe-D-Hoe is a great incentive for operators to hone their skills. Perhaps there should be more state-level competitions.

By Ted J. Rulseh, Editor



I've never been a big car race fan, and I am not to this day – but an experience I had some years ago made me appreciate the drivers' skills.

I went with my son on a Cub Scout outing to a dirt-track stock car race near Milwaukee. The special guest was a NASCAR driver, who ran a race against the locals in his shiny car painted like a beer can.

He started at the back of the pack, and it was impressive to see him pick his way forward through the field, bit by methodical bit, until in the end he took the checkered flag. Trying to imagine myself doing what he did, all I could envision was the pile of twisted metal I surely would have created running at such speeds in close quarters.

It's entertaining to watch these guys, and a few women, jog that excavator bucket in increments of perhaps an eighth of an inch at a time to complete the events. I imagine any operator worth his or her salt would love to have a run at this competition.

I am similarly impressed when watching competitors in the NOWRA Roe-D-Hoe at the Pumper & Cleaner Expo. Here, I imagine having to be timed not with a stopwatch but with an hour-meter as I try to manipulate bowling pins, golf balls and miniature basketballs using a mini excavator bucket and joystick controls.

True professionals

Yes, it's true, I've never run an excavator or backhoe. Still, I would like to try my hand at the Roe-D-Hoe just to experience firsthand the difference between myself and the folks who lead these competitions.

I recall watching the fellow who excavated for the septic system at my Northwoods cottage, being amazed at the precisions and speed with which he took down trees and scooped out the drainfield trenches. I have no doubt he would have done well in the Roe-D-Hoe.

Here I must observe: What a great event this is! It's a chance for operators to sharpen their skills by competing with their peers, and to get recognized for the excellent technicians they are. So why aren't these contests more widespread?

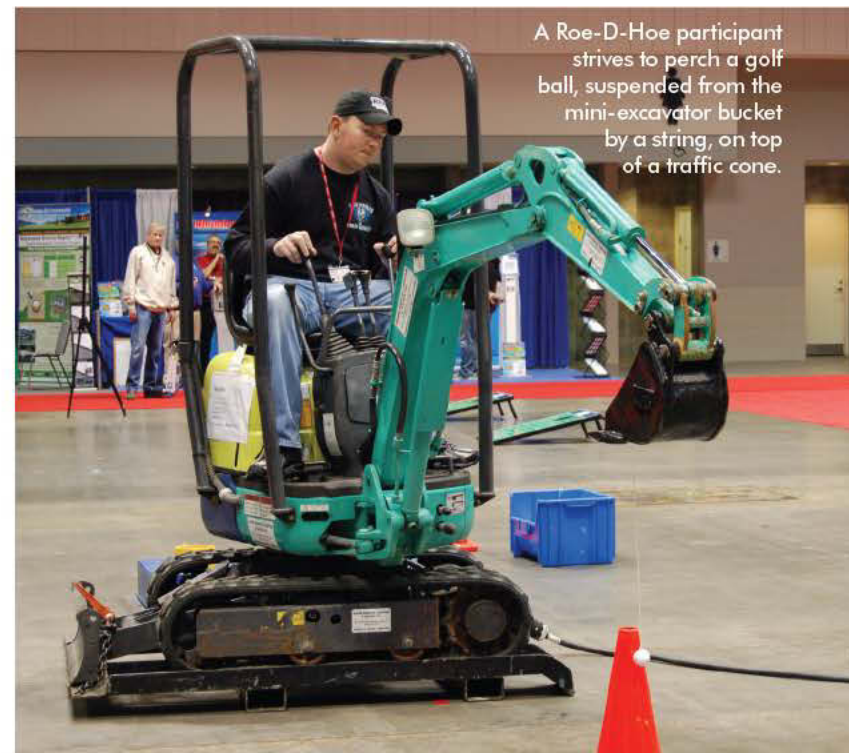
Some NOWRA state affiliate organizations have Roe-D-Hoe competitions

at their annual conventions. My home state of Wisconsin is one of them, and the state champion, Mark Schairer of Mark Schairer Excavating in Campbell-sport, finished fourth in the national Roe-D-Hoe at the Pumper & Cleaner Expo Feb. 27-March 1 in Indianapolis.

State champions win an automatic trip to the national finals. It would be nice to see a couple dozen of those instead of just the handful we see today.

Not that difficult

While it's difficult to duplicate what the top performers do at the controls of their machines, it's not that hard to put on a Roe-D-Hoe. The toughest part most likely is getting an equipment dealer, manufacturer or contractor to loan out a machine. After that it's a question of locating a space and setting up the course for the basketball, golf and bowling events. From



A Roe-D-Hoe participant strives to perch a golf ball, suspended from the mini-excavator bucket by a string, on top of a traffic cone.

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It's entertaining to watch these guys, and a few women, jog that excavator bucket in increments of perhaps an eighth of an inch at a time to complete the events. I imagine any operator worth his or her salt would love to have a run at this competition.

So how about it, state onsite organizations? Wouldn't it be great to see a whole series of state champs battling it out at the nationals along with the on-site qualifiers? What a way to recognize professionalism. What a way to build camaraderie. What a way to foster interaction among practitioners from different states.

There's plenty of time to plan and hold state competitions before the 2013 Roe-D-Hoe at the Pumper & Cleaner Expo, Feb. 25-28. Gentlemen, start your excavators! ■

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Crew member Josh Hummel levels drainfield rock (laser level from Topcon). (Photography by Harry Fisher)

Fixing the RIGHT PROBLEM

Christman's Septic approaches system repairs and replacements by first getting a thorough understanding of the site and all defects

By Gil Longwell

Referrals from satisfied customers bring a continual flow of business to Christman's Septic Service, even in a down economy. "We solve people's problems, and we refuse to fix problems

somebody else has diagnosed," says Gary Christman, co-owner. Successful solutions start with careful problem analysis and build from there to complete customer satisfaction.

"I will not put our reputation at risk by relying on an investigation we did not perform," Christman says. "If we did not do the investigation, we cannot be certain the solution proposed is the right one. Our interest is in repairing and returning existing systems to full performance. If that is not possible, we recommend a completely new system matched to the site's conditions, regardless of the challenges we encounter."

"I will not put our reputation at risk by relying on an investigation we did not perform. If we did not do the investigation, we cannot be certain the solution proposed is the right solution."

Gary Christman

The company's crews have installed countless complete systems but have never installed the first system on a property to serve new construction.

(continued)

Christman's Septic Service, Fogelsville, Pa.



- OWNERS:** Gary & Phil Christman
- YEARS IN BUSINESS:** 26
- EMPLOYEES:** 11
- MARKET AREA:** 25-mile radius
- SPECIALTY:** Restoring failing systems on challenging sites
- AFFILIATIONS:** Pennsylvania Septage Management Association, Pennsylvania Association of Sewage Enforcement Officers, National Environmental Health Association
- WEBSITE:** www.christmansseptic.com

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Located in Fogelsville, Pa., on the western edge of the Lehigh Valley about 60 miles northwest of Philadelphia, Christman's Septic works on projects within a 25-mile radius.

The business includes about half system replacements, repairs and inspections, and about half pumping of residential and commercial systems, including holding tanks and grease traps.

Finding opportunity

The valley is within 90 minutes of New York City and has seen continued growth despite the national slow-down in home construction. "We find there is plenty of work in our niche in this area," Christman says. "People either choose not to move and instead fix their problem systems, or buyers negotiate system repairs as a condition of a sale."

Operations manager Dave Hummel observes, "If it can be repaired, no matter how basic or complex the repair, it falls in our niche. We have no allegiance to any particular technology or system design. If a design or technology meets the site's needs, we will propose it to the owner. Often the owner has the opportunity to review and choose from more than one option."

This open-to-all approach requires an investment in employee training that the company makes willingly. It also takes a willingness to learn new technologies approved by the state Department of Environmental Protection (DEP).

Hummel's son, Josh, a state-certified sewage enforcement officer (SEO), performs soil evaluations, conducts percolation tests and designs complete systems. This lets the company handle entire projects, from diagnosis to seeding, with its own resources.

"The only thing we do not do is issue the permit and inspect the final installation," says Josh. "Those tasks are exclusively reserved for the municipal SEO." Josh is qualified to handle all administrative aspects of a project. He has completed all available DEP training and has a working knowledge of all permissible technologies.

In this regard, he may have completed more training than

Crew member Josh Hummel (in excavator) and his colleagues are committed to finding the right remedies for failing systems.



The Christman's Septic team includes, from left, operations manager Dave Hummel; crew members Travis Turney, Josh Hummel and Rick Smith; and owner Gary Christman.

Good Help

"Employees are expensive assets that I want to preserve, protect and nurture," says Gary Christman, co-owner of Christman's Septic Service.

Christman carefully screens good people he can develop into great employees. The company invests in training and credentialing to field a knowledgeable and highly competent workforce. Team members receive health insurance, dental insurance and other benefits.

As Christman sees it, forcing employees to buy their own health care is a disincentive to loyalty and employee longevity. He looks at employer-provided care as a bonus and is happy to pay for it to ensure satisfied employees who are committed to the company's mutual success.

Christman wants a healthy crew ready to go to work every day, and his concern continues on to the workplace. On the job, he prepares employees to perform potentially dangerous work using the safest techniques possible. "We require employees to attend confined-space entry training to protect them from danger," he says.

the municipal SEO. Working across an area of nearly 500 square miles, he sees a greater diversity of soils and system types than an SEO serving one municipality. Having the SEO resource in-house gives Christman's a significant advantage over installers who must hire consultants to review sites.

Christman's approach starts with a comprehensive inspection of the system, from the building sewer to the absorption area and all components in between. Once they locate all defects, they evaluate each item's contributions to the problem.

"We do not stop with the first defect we find, assume we have found the entire problem, and propose what could be a limited solution," Christman says. Everything from the replacement of a 99-cent cleanout cap to a new

(continued)



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Travis Turney wires a pump station (in the background, dual-compartment septic tank from Monarch Precast Concrete Corp.)



absorption area requires a permit in Pennsylvania; the difference is the complexity of site evaluation and the design of the remedy. In-house, Christman has developed a fully qualified team to deploy to suit any situation.

He observes, “We have a good team. We like problem-solving challenges. We get a sense of accomplishment when we resolve the issues.”

Rule nothing out

Christman and Hummel approach every trouble call with an open mind. “We never know what we will encounter,” Christman says. “To assume the answer before we understand all the site has to tell us would be a disservice to those who call us.”

“We have no allegiance to any particular technology or system design. If a design or technology meets the site’s needs, we will propose it to the landowner. Often the landowner has the opportunity to review and choose from more than one option.”

Dave Hummel

Like a team of physicians, they gather a complete system history. Without understanding a problem in depth, they can easily misread the symptoms, miss the underlying circumstances and repair the wrong thing.

“We had a call regarding a basement sump pump problem,” Christman recalls. “We only knew the pump ran ceaselessly.” On site, they learned that the pump’s behavior had started more than a year earlier. The homeowner had no idea that the sump was discharging effluent, not groundwater. When someone reported sewage on the road to the local government, the owner called Christman’s.

The key question was: Where is the effluent coming from? “We checked the building sewer, treatment tank and effluent delivery lines,” says

Hummel. “All were intact; they were not the source of the effluent.” The property’s history showed that the lot was subdivided from an adjoining mobile home community. They remembered that the effluent from the house was previously directed to an absorption area on the now-separated property.

“We wondered if there could be a connection,” Christman says. A dye-test of the neighbor’s system validated their hypothesis. They excavated the building sewer and confirmed that effluent was moving from the other property through the void space in the pipe bedding aggregate. “This flow passed our owner’s treatment tank, finding its way through the soil under the house, and eventually reaching the basement sump,” Christman recalls.

Making the fix

The repairs were straightforward. “Before replacing the building sewer, we removed all of the bedding aggregate, replacing it with heavy clay below and around a new building sewer,” says Hummel. “Solving the inflow problem solved the pump overrun issue.”

The mobile home park’s system was found to be in failure, leading the owner to install a new system using aerobic treatment units discharging to two elevated sand mounds. The original customer’s system was also found to be in failure, and the Christman’s team designed a new one that the DEP categorized as experimental. Permit conditions required both owners to enter management service contracts.

“It was over a year before the two properties’ systems were permitted and operational,” Hummel recalls. “One of the biggest challenges was convincing the municipal regulator that we had found the source of the sump discharges and that it came from the neighbor’s property.”

Embracing technology

Whether making repairs or installing new systems, Christman’s employees know an impressive list of onsite technologies, from Ecoflo (Premier Tech Aqua), Infiltrator Systems, Orenco Systems, American Manufacturing, Polylok, Goulds Water Technology, Liberty Pumps, SoilAir, and others.

The company uses products from Monarch Precast Concrete and

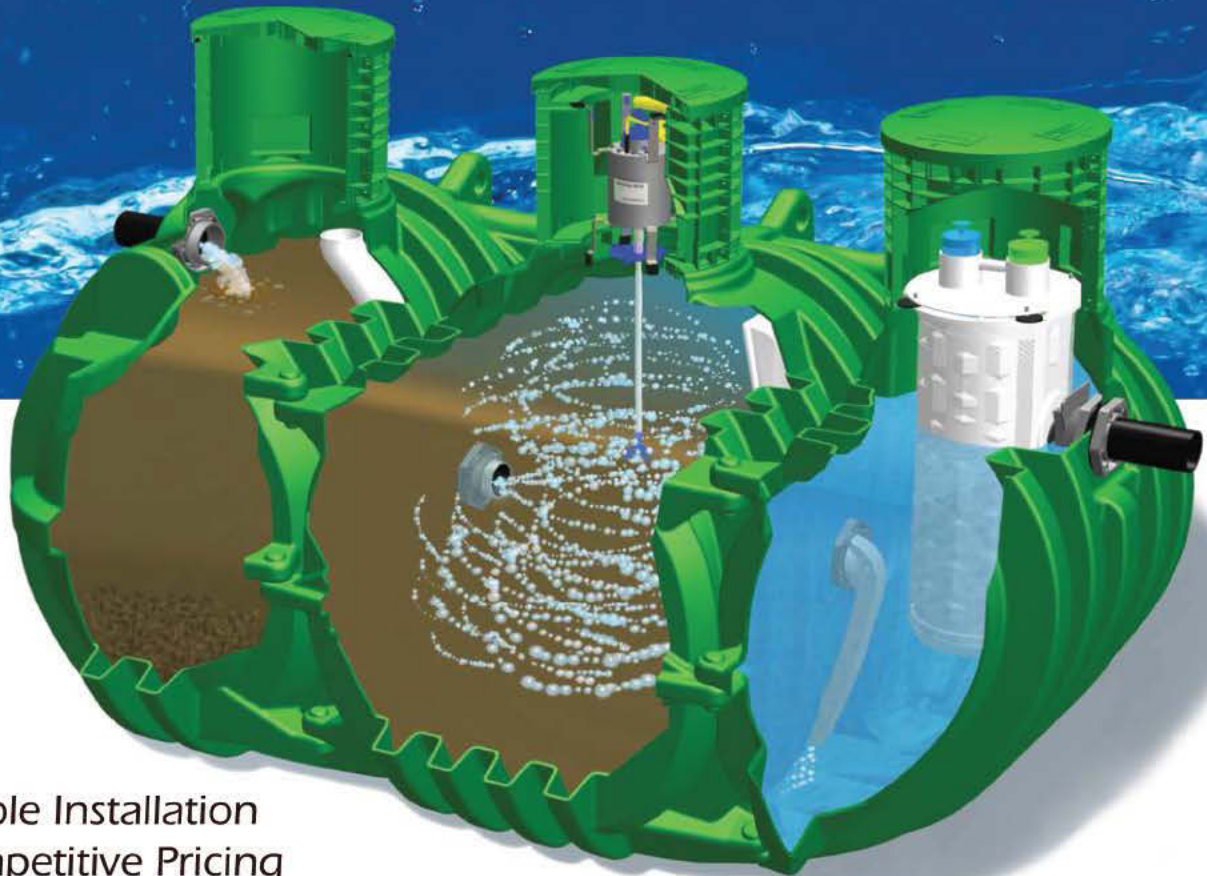
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Reading Precast, two local tank manufacturers. Christman has found ways to identify and deploy business-boosting technologies first developed for other endeavors.

For many years the company's purpose-built database worked extremely well and enabled high-level data analysis, but it had its limitations. The company is now transitioning to a cloud-based database application. Part of the transition includes introduction of the Intuit Field Service Management System.

"This enables every employee to capture customers' payments in the field at the time of service," Christman says. "Each employee carries a smartphone, the customer provides the credit card, and the payment is posted before our person leaves the service location."

Field payment processing is linked to the QuickBooks accounting package. Payments are always posted to the correct account. The system can be expanded to print receipts on the spot. Employees' smartphones have GPS locator signals that let the office know their locations in real time. The system also plots job sites on the same display map. This is a great tool for deciding which asset to send to what emergency call.

Other system capabilities include job planning, work-in-progress reports, and payment status. "This is a great tool that gives Dave and me situational awareness at all times," Christman says. While he is a frequent Facebook and SmugMug participant, he generally reserves those portals for social exploration.

"We are not currently offering system management programs. We will provide it on request, but we are not marketing it."

Gary Christman

Christman has built the business on employees' strengths. "Josh Hummel has a strong electrical background which makes him more valuable," he says. Dave Hummel adds, "He brings diversity and depth to our capabilities, allowing us to go after projects we might otherwise have avoided or for which we may have needed to subcontract portions of the work."

Another advantage Josh brings to the job site is his ability to speak on equal terms with municipal SEOs. "An installer who is not an SEO is at a disadvantage in these conversations," Christman believes.

Pre-sale inspections

Key employees have completed a training program that prepares them for the inspection of existing onsite systems. "Typically, we get called in to do a



Crew member Rick Smith prepares piping for a drainfield.

second-opinion inspection when the initial report identifies problems," Dave Hummel says. Problem-identification begins with a comprehensive evaluation that serves two purposes.

The customer receives an unbiased second opinion, and the company gathers enough information to understand the system and propose the right array of solutions. In essence, the company is paid for troubleshooting.

In many market areas, most system inspections are done by home inspectors rather than by onsite system professionals. "It is common for us to read the initial report, compare it to ours and wonder if both reports relate to the same property and system," says Josh Hummel.

The Christman's Septic Service website displays links to several industry associations. "Showing potential customers the groups we are affiliated with builds our credibility in the industry," Christman says. "By visiting those sites, customers can learn about onsite systems and see that our company is on top of industry trends."

The connections legitimize Christman and what he tells customers. The links also convey a subtle advertising message: We are known by the company we keep. "One link represents accolades delivered by customers and bestowed upon all of our employees," says Christman.

The Allentown Morning Call, the local newspaper, sponsors an annual business recognition program called the Readers' Choice Awards. The company received that award in 2005. "This was the last year septic system maintenance was included in the contest, so that makes us the reigning champ," Christman says.

Maintenance side

While specializing in repairs, Christman's does not routinely offer system management programs at present. "We will provide it on request, but we are

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not marketing it,” Christman says. He likes the idea that management services keep the company name in customers’ minds.

Management goes hand in hand with pumping, and soon Christman expects a focused expansion in that direction. He got started in the waste industry driving an uncle’s trash truck during the year he took off from college to make some money.

By 1985, he owned a vacuum truck and was successfully pumping tanks. It was not until he and his brother Phil created a partnership that he was able to take a vacation. The company today has 10 employees working in three counties.

Dave Hummel, as operations manager, keeps the work flowing by deploying assets to the best advantage. Josh Hummel handles site and system evaluations, system designs, and electrical specialty work. His brother Luke is the head service technician.

David Makovsky, an assistant service technician, helps Travis Turney, operator/installer, on installation sites. Tabitha Malinowski, administrative assistant, ensures an orderly workflow. She sees that vacuum truck operators Willard Krum, Dennis Klechner and Richard Smith are on time servicing tanks on a schedule convenient to customers. For commercial customers, this may mean servicing them late in the evening or early in the morning so that the vacuum truck is not an obstacle to customer traffic.

The company’s equipment is well suited to address any field condition. Five manufacturers are represented in excavating equipment alone: John Deere, Case, ASV (Terex), Terramite and Komatsu. Only the Deere Extendahoe is more than four years old.

Chevy, Ford and Peterbilt nameplates are on the eight service and dump trucks that can pull any of four trailers in capacities from 3,000 to 40,000 pounds.

Christman’s Septic Service has built a reputation that causes prospective customers to seek the company out. “We are usually not the first company to be called,” says Christman. “We are not the cheapest, but when others give up, they are happy to have us to call on. This is a compliment, and we appreciate their confidence.” □

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

Keep It Clean

When installing mound systems, one of the most essential ingredients is the proper grade of washed sand

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

This month we continue to address some issues we have seen with installation of mound systems, causing some installers to question whether these systems are truly effective in dealing with problem soil conditions.

After proper surface preparation and treatment of the natural soil (described in last month's column), the next area where we see many mistakes made is in the selection of the sand used to distribute septic tank effluent over the soil infiltrative surface.

Over the years, the definition of "clean, washed sand" has been clarified, as experts recognized that many mistakes were being made in the sand selection. Additional research studies pointed toward sand specifications as a significant factor in mound system performance.

The original definition of proper sand for mounds was clean sand containing no more than 10 percent silt- and clay-size particles. Research showed that the amount of fine silt and clay should be reduced to no more than 3 percent. This finding recognized that fine soil particles can migrate as effluent is applied and then collect in areas within the sand, or at the sand-soil infiltrative surface, restricting movement of water through the system.

Sieve testing

This has led most permitting authorities to call for washed sand to ensure that the fines have been removed. Sand is characterized by a sieve analysis, performed using a set of stackable mesh trays starting large and getting successively smaller. The sieves have numbers that correspond to the number of holes per inch in the mesh.

Clean sand is checked for the proper depth after application to the top of the bed.

The soil sample is placed on the top sieve and run through a shaker to separate the different size grains. Material collected from each sieve is weighed, and a spreadsheet is set up with the sieve size/number and the weight of the soil retained on each sieve. The cumulative percent retained and passing each sieve is calculated and recorded. The cumulative passing is the most important because it tells how much of the sample is particles smaller than the sieve size.

Over the years, the definition of "clean, washed sand" has been clarified, as experts recognized that many mistakes were being made in the sand selection. Additional research studies pointed toward sand specifications as a significant factor in mound system performance.



Here is where life becomes a little interesting and confusing. The research on mounds and other soil treatment systems has been conducted using the USDA soil textural classification system to describe soil conditions. This is because the USDA system overall closely relates to the ability of water to move into and through the soil.

Use of this system began with characterizing natural soil conditions but also extends to the definition of clean sand for mound systems. This is key because the sieve sizes and the soil particle size classifications do not match with either the Unified or AASHTO engineering particle size classification systems; either as size or definition. It is important when doing a particle size analysis to use the correct sieves that correspond to the sand specifications required for a mound system.

Knowing the definition

The definition now used to specify clean sand suitable for use in mound systems is a soil texture composed of:

- At least 25 percent very coarse, coarse and medium sand varying in size from 2.0 to 0.25 mm.
- Less than 50 percent fine or very fine sand ranging in size from 0.25 to 0.05 mm.
- No more than 3 percent particles smaller than 0.05 mm.

Particles smaller than 0.05 mm in the USDA system are considered silt- or clay-size. Here are the particle names, sizes and sieve numbers used in the USDA classification system.

Particle Name	Particle Size Range	Sieve Numbers
Very coarse sand	2.0-1.0 mm	10-18
Coarse sand	1.0-0.5 mm	18-35
Medium sand	0.5-0.25 mm	35-60
Fine sand	0.25-0.10 mm	60-140
Very fine sand	0.10-0.05 mm	140-270

Anything passing the 270 sieve is a silt- or clay-size particle, so that number needs to be less than 3 percent for the sand to qualify as clean. Reaching that level usually requires the sand to be washed.

In addition, the sand should have a low uniformity coefficient – that is, it should contain a wide range of sand particle sizes, and in particular there should not be a large percentage of fine sands. Systems constructed with highly uniform fine sands have been shown to be less able to accept and transmit septic tank effluent.

Checking in the field

As an installer, you should work with your supplier to make sure the correct sand specifications are used. There is a field test you can use to check whether the sand being delivered has too many fines.

Place two inches of the material in the bottom of a quart jar and fill the jar three-fourths with water. Cover the jar and shake until the contents are suspended. Allow the jar to stand for about an hour and observe whether there is a layer of fine material on top of the sand after it settles to the bottom of the jar.

If the layer is more than 1/8-inch thick, the sand is probably not suitable to use for mound construction. Refusing the sand may be costly in the short run; but in the long run, you will prevent system failures, and that will pay dividends to your reputation as a quality installer. □

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By **Scottie Dayton and Doug Day**

"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.

Florida

The Senate approved a bill that would direct cities or counties with first-magnitude springs to develop septic tank evaluation programs or vote to eliminate the requirement. A similar measure that would give local governments the power to make many decisions about septic tank inspections passed one House committee. Another House bill proposes eliminating the Division of Environmental Health which oversees septic tanks. It also would place county health departments under county commissions, thereby making counties eligible for block grant funding.

Utah

A bill would remove the authority of county or city health departments to establish septic system regulations stricter than state or federal rules. The Utah Association of Counties voted unanimously to oppose the bill.

Minnesota

The Association of Minnesota Counties is pushing for passage of the Minnesota Accountable Government Innovation and Collaboration Act, which would allow counties to experiment with approaches to streamline services and save money. The legislature would then decide whether to make it a permanent option statewide.

Todd County administrator Nathan Burkett says the act could help his county work with the Minnesota Pollution Control Agency's ruling that as of April 2012, all septic tanks must meet 2011 design standards. Burkett would rather make sure onsite systems were functioning properly without requiring residents to upgrade them.

Maryland

Along with a bill to restrict septic system use in Maryland, Governor Martin O'Malley has proposed an increase in the state's flush tax. For septic system users, the fee would double from \$30 a year to \$60. People hooked up to sewer systems could pay more, as the fee would change from the straight \$30 to a user fee of \$1.80 for up to 2,000 gallons of metered water use and \$1.25 for every 1,000 gallons after that. □

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Perfect Union

A marriage of technologies enables a restaurant owner in southeast Ontario to meet provincial septic system requirements

By **Scottie Dayton**

A major kitchen addition to a traditional English pub in Carp, Ontario, required a review of the 1,200 gpd onsite system. Although there was no evidence of effluent break out, the sand mound was clogged with biomat and displaying signs of distress.

Terry Davidson, director of regulations at the Ottawa and Mississippi-Rideau Septic System office, ordered the owners to cap the system and use the septic tank as a temporary holding tank until the system was upgraded or replaced.

Eric Draper, owner of The Septic Store in Osgoode, offered a solution involving a submerged buoyant-media aeration system designed for high-strength waste and pre-plumbed and wired, fully assembled treatment packages with textile media filters.

The owners approved provided the pub would be allowed to remain open. Draper worked with Matt Rainville of Houle Chevrier Engineering in Ottawa to design the replacement system. “We had a space about 85 by 75

SYSTEM PROFILE

Location:	Carp, Ontario
Facility served:	English pub
System designer:	Matt Rainville, Houle Chevrier Engineering, Ottawa
Installer:	Mike Coady, Ketch Construction, Carp
Site conditions:	Sand to sandy silt with a loading rate of 0.5 gallons per square foot per day, seasonal water table about 5 feet below grade, bedrock 6 to 7 feet below grade
Type of system:	Nibbler SBP high-strength treatment system, Aqua Test; AdvanTex treatment system package, Orenco Systems
Hydraulic capacity:	2,000 gpd



Working beside a heavily traveled road required extra safety precautions for crews setting up the Nibbler SBP treatment tank. AdvanTex AX20 treatment pods with room for a third are shown to the right. (Photo courtesy of Orenco Systems)

feet behind the building that abutted busy roads to the east and south and a property line with trees and utilities to the west,” says Draper. “It was your typical shoe box situation.” The system just fit.

Site conditions

Soils are sand to sandy silt with a loading rate of 0.5 gallons per square foot per day. The seasonal water table is about 5 feet below grade, and bedrock is 6 to 7 feet below grade.

System components

Rainville designed the system to handle 2,000 gpd at a waste strength of 1,300 mg/L BOD per day. The major components are:

- 2,000-gallon concrete grease interceptor. All tanks made by Armtec, formerly Boucher, Precast Concrete, Ottawa.
- 4,000-gallon two-compartment septic tank.

(continued)

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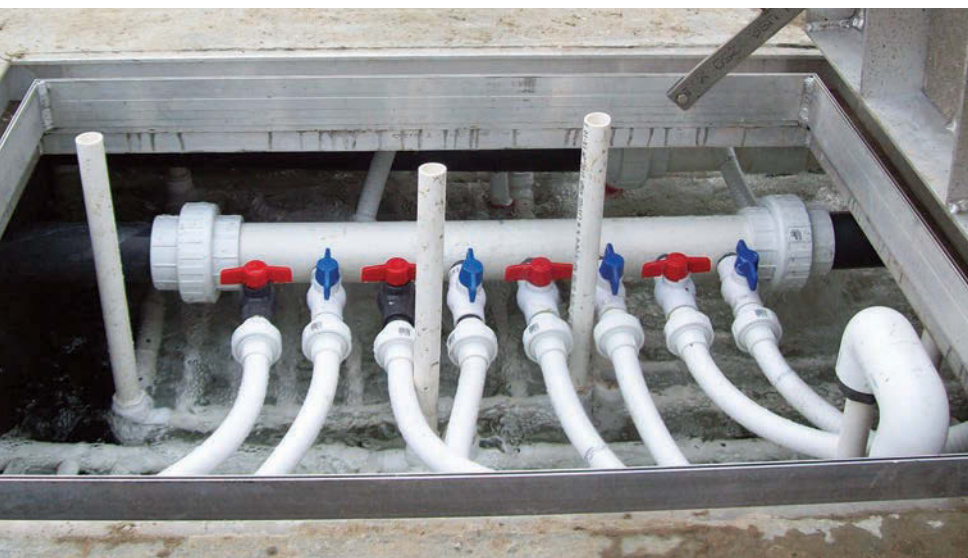
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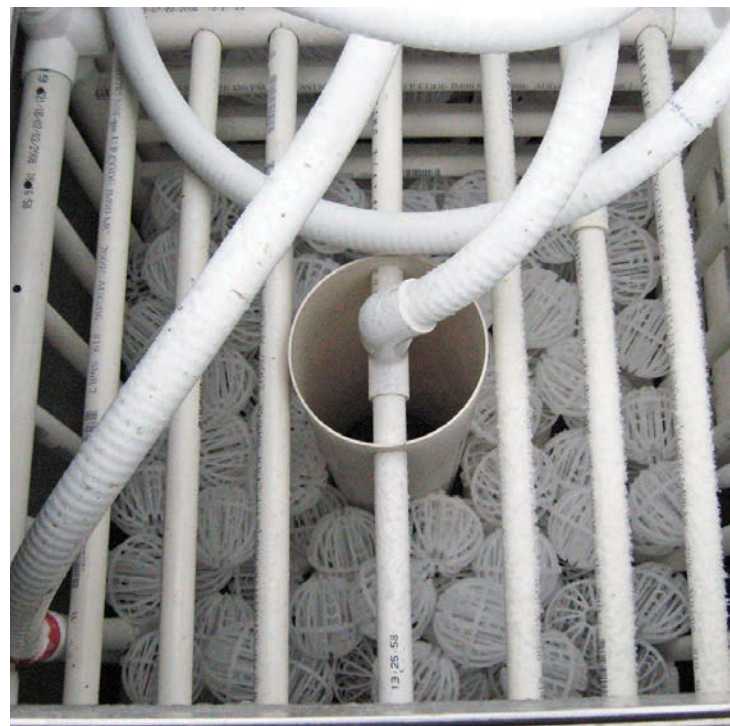
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ABOVE: The ball valve system inside the Nibbler SBP tank enables service providers to remove excess biomass without lifting out the treatment pods. Blue handles (in the open position) aerate the interior of the unit. Closing them and turning the red handles directs air to the underside of the pod, scouring the media. (Photo courtesy of Aqua Test)
RIGHT: Each treatment pod has 3.5-inch media spheres, creating a vast surface area for microorganisms to attach to. (Photo courtesy of Orenco Systems)



- 4,000-gallon single-compartment concrete surge tank with duplex alternating 1/3 hp pumps from Goulds Water Technology.
- 4,000-gallon treatment tank with 18 Nibbler SBP (square backflush pods) from Aqua Test.
- 3,000-gallon clarifier-recirculation tank with 1/3 hp Goulds effluent sludge return pump and effluent filter from Orenco Systems in the first compartment, and Orenco Biotube duplex 30 gpm high-head pump vault in the second riser.
- Two 20-square-foot AdvanTex AX20 Orenco secondary treatment fiberglass filter pods with room for a third.
- 2,000-gallon dose tank with duplex 30 gpm, 1/2 hp high-head Orenco pumps.
- 50- by 32-foot sand mound with 10 laterals of 3-inch PVC perforated pipe with 1/2-inch holes drilled at 4, 8 and 6 o'clock positions.
- VeriComm Web-based Orenco monitoring system and control panels. Components supplied by The Septic Store, Osgoode.

System operation

Kitchen waste flows through the grease interceptor and into the septic tank. Wastewater from the restrooms has a separate lateral to the tank. Laterals and plumbing are 4-inch PVC pipe.

Liquid drains into the surge tank where pumps run 27.7 seconds every 30 minutes, sending 23 gallons (1,200 gpd) to the Nibbler SBP treatment tank. "Influent analysis averaged 1,000 to 1,300 mg/L BOD5, 500 to 1,000 mg/L CBOD, 100 to 150 mg/L TSS, and 50 to 75 mg/L FOG," says Draper. "We wanted to bring the BOD down to residential strength before sending it on for treatment. The Nibblers have done that."

Each 27-inch-square pod treats 0.81 pounds per day BOD5 and FOG. Inside the pod, microorganisms cling to 3.5-inch media spheres. The dynamics are such that within seconds of effluent entering the tank, it is thoroughly mixed with the liquor.

"This is not your typical aeration system," says installer Mike Coady of Ketch Construction in Carp. "It's much more robust. Lift the lid and the action resembles an old washing machine. If FOG slows down, it clings to

something or settles, so the liquor is agitated by introducing 6.5 cfm of air into each Nibbler pod."

Wastewater detention time is 36 hours. An outlet baffle extending down to the central clear zone of the tank allows liquid to gravity-feed to the clarifier-recirculation tank. Aerobic organisms die within 12 hours of entering the clarifier and are pumped to the inlet side of the grease interceptor. Liquid in the clarifier flows through the effluent filter and into the recirculation tank.

"The combination of treatment technologies enabled us to reduce the size of the drainfield by almost 60 percent. That's the only way we had room for it."

Eric Draper

Run times on the pump in the recirculation tank fluctuate based on flow data averaged over 30 days by the control panel. When activated, the pumps send 18 gallons in 30 seconds to the AdvanTex filter pods, then rest for 4.5 minutes. As liquid trickles through sheets of synthetic textile in the units, microorganisms digest the remaining impurities so completely that nothing remains to form a biomat in the drainfield.

Effluent collecting at the bottoms of the pods gravity-flows to the recirculation tank and keeps recirculating until the compartment is full. As liquid flows from the tank, a splitter valve alternately doses the dose tank, feeding the sand mound, and recirculation tank. "The combination of treatment technologies enabled us to reduce the size of the drainfield by almost 60 percent," says Draper. "That's the only way we had room for it."

Installation

Coady's crew spent more than a week beating out the rock with two excavator buckets. "It was a delicate situation because the stone building is a historic landmark protected by the Ontario Heritage Act," says Coady. "Vibrations from our work could have damaged the foundation or cracked walls. It made life very stressful."



Workers clean up as system backfilling begins. (Photo courtesy of Orenco Systems)

His crew excavated the hole for the septic tank first, added 8 inches of screened 3/4-inch stone, then set and plumbed the septic tank to activate it. Its larger capacity reduced the frequency of pumpouts.

Mark Fricke, regional sales manager from Aqua Test, and Ted Kulongoski, international account manager from Orenco, arrived in early December to supervise installation of their components. "There was snow on the ground, but it wasn't bitterly cold," says Coady. "We were lucky. The weather cooperated and we stayed on schedule."

After removing the existing drainfield, workers roughed up the soil in

the 50- by 32-foot bed, poured and leveled 30 inches of washed sand, and shaped the upslope and sides to a 3:1 grade. "The big challenge was limiting disturbance and not compacting the mound basal area," says Coady.

The crew added six inches of stone, then laid 10 laterals 45 feet long in one zone. Workers covered the piping with two inches of gravel, rolled geotextile fabric over it, and cut slits to install inspection ports on either end of the drainfield. They topped the fabric with six inches each of silt loam and topsoil, also sloped to promote drainage.

"We didn't fence the system because customers won't see it from the parking lot on the other side of the building," says Coady. The system meets effluent quality requirements of 15 mg/L BOD and 10 mg/L CBOD and TSS.

Maintenance

Rideau Valley Septic Services in Ottawa holds the service contract. A technician checks the system quarterly and draws samples twice a year. When the media spheres in the Nibbler SBP pods develop an excessive biomass, the maintenance provider closes the valve providing aeration to the interior of the unit and opens the valve directing air to the underside of the pod. The air velocity scours the media, sending biomass to the bottom of the tank. The system will be pumped as needed. □

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Much Worse Than it Looks

Although not common, high-pressure hydraulic injection injuries are extremely serious and call for careful preventive measures

By Ted J. Rulseh

Imagine you're working on one of your machines, sleuthing for a leak in the hydraulic system, poking around in a bundle of hoses. You suddenly feel a sharp pain at the base of a finger, as if something bit you, or as if you got poked by an exposed wire.

Now you have what looks like a fairly innocent puncture wound. It doesn't hurt terribly, so you just "shake it off" and keep working. That decision may have just cost you a part of your hand.

What you have may be a hydraulic injection injury – generally regarded by doctors as an emergency requiring surgery. Damage to tissue may already be occurring. In time your hand will begin to throb and swell. If you delay treatment, enough damage may occur to require amputation of one or more fingers.

What happened?

Evidence indicates that hydraulic injection injuries are rare, but their severity demands that they be given attention. A Fluid Power Safety Institute (FPSI) study found that 99 percent of people who service, repair and troubleshoot hydraulic systems "have been subjected to the exact dynamics that trigger a high-pressure injection injury."

A scary aspect of these injuries is that the fluid can strike under such pressure that wearing work gloves provides little or no defense.

But apparently in most cases it happens that the stream is aimed away from the person or is being deflected, so that it does not harm.

People at risk of these injuries could include you and your employees, if you work on your own equipment. How do these injuries happen? You know that hydraulic systems operate under high pressure. Fluid escaping from a source such as a pinhole leak in a hydraulic line can act like a "liquid bullet," penetrating deep into tissue.

The fluid does damage on the way in, but that is only the beginning. Many fluids are caustic and quickly kill more tissue. The fluid then migrates through the fingers, hand and wrist, doing still more damage. Infections from bacteria in dead tissue often occur. Further, having been injected under pressure, the fluid can cause pressure buildup within "compartments" of the hand, damaging tendons, blood vessels, muscles and nerves.

Doctors generally consider taking these injuries straight to the operating room for surgery to relieve the pressure, remove the injected fluid, and trim away dead tissue. More surgeries may be needed a day or two later to re-examine for foreign matter or more tissue damage.

The injury's severity depends on what kind of material was injected, how much of it, where it struck, and how soon the person gets medical attention. One problem with treatment is that doctors in a medical office or emergency room may misdiagnose the injury and send the person home with antibiotics or painkillers, or simply with instructions to keep the wound clean and rest.

Hard to detect

A scary aspect of these injuries is that the fluid can strike under such pressure that even heavy-duty work gloves provide little or no defense. The best protection is to keep hands and arms completely away from possible sources of fluid leaks.

When working on hydraulic systems, mechanics often run their hands over lines suspected of leaking, unknowingly putting themselves at risk. In other cases, they try to open or tighten lines, not realizing that pressure is still stored inside the system. Opening a line can cause a high-pressure release of fluid. Similarly, overtightening a fitting can lead to a split or crack through which fluid can escape.

Even when equipment is shut down, the FPSI says, hydraulic systems can retain pockets of high pressure. This can happen even after the pumps are shut off and the control levers are cycled to dissipate residual pressure.

Taking precautions

Leaks can be so small that they are not easily visible; in some cases all that shows is the fluid that accumulates on the ground or on a machine part. In addition, the source of a leak may be hidden within a hose bundle or behind other machine components. A technician who moves components while searching for a leak may actually end up aiming the high-pressure fluid stream at himself.

Experts say technicians should never use their hands to look for leaks. If necessary, they can place an object like a piece of cardboard, wood or steel in the path of a suspected leak. They should also use similar objects, rather than their hands, to move hoses or other obstacles.

The FPSI recommends following best practices for investigating fluid leaks. They include wearing personal protective equipment (PPE) that

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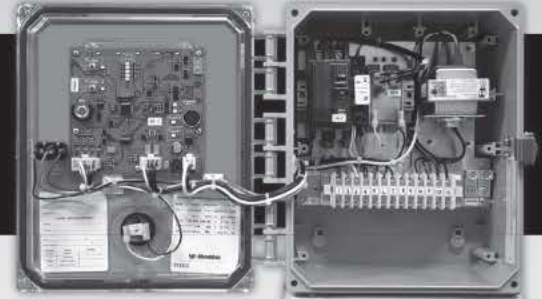
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includes safety glasses and a full-face shield, de-energizing all hydraulic system zones that could store energy, and making sure everything is de-energized. Once that is done, a technician can run gloved hands over hoses searching for possible leaks and can safely loosen connectors.

Finding out more

In the event someone sustains a suspected injection injury, the person should be taken to a hospital emergency room or trauma center. Ideally, ice or a cold pack should be applied to the site to suppress swelling. It is helpful to show caregivers the name of the substance injected and the approximate pressure at which the injury occurred.

To advance the cause of properly treating these wounds, the FPSI offers a 15-minute DVD program, "The Lethal Strike: Procedures for Properly Managing Injection Injuries." It covers what to do if someone suffers such an injury, what NOT to do, how to make sure the person gets proper medical treatment, and the responsibilities of everyone involved: the victim, the supervisor, the company owner or safety director, medical first responders, and physicians.

Bonus features include interviews with a hand surgeon and a medical director. You can watch a preview at www.fluidpowersafety.com/dvdintro.html. □

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Septic Tanks and Components

By Briana Jones

Durable septic tanks

Ace Roto-Mold 1,500-gallon septic tanks from **Den Hartog Industries** are designed to be safe and durable and are manufactured with rigorous quality controls. The horizontal-flow, single- or double-compartment units are made to be installed up to 36 inches below ground. Tanks feature a circumferential ribbing and interior baffle system to sustain external pressures of up to 500 psf. They have two access openings sealed to the tank with rubber gaskets.

A custom-molded gasket system locks firm for a watertight seal. Tanks are available plumbed in accordance with state or county specifications. Tanks and access covers are made of high-density polyethylene with UV stabilizers. Double-walled access covers interlock with the tank body using three bayonet keys. The lid design locks in place with nylon ties. The tanks have been tested by NSF to meet the IAPMO Z1000 and CAN/CSA-B-66 standards. 800/342-3408; www.denhartogindustries.com.



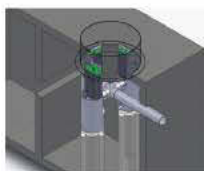
Lightweight lids

Septic lids from **Hedstrom Plastics** are made of green, heavy-wall polyethylene and fit standard 18- and 24-inch double-wall corrugated pipe (not included). The lightweight lids can be customized with company names. Covers can be filled with sand on site for added weight. Gaskets and safety hardware are included and foam-filled lids are available. Tank adapters are available in 18- and 24-inch sizes. Safety nets are available. 800/765-9665; www.hedstromplastics.com.



Filter manifold

The 3-Filter Manifold from **Bear Onsite** allows three ML3-9XX series or ML2-9XX series effluent filters to be installed and serviced within a 24-inch riser assembly. Cases and cartridges can be tightly clustered using a 4-inch SCH 40 PVC cross, allowing a maintenance plate to be inserted into each case to shut off flow, or allowing each filter cartridge to be removed for cleaning, while still leaving room to pump and service the tank. The configuration allows for increased flow needed for higher-capacity systems and extends intervals between service calls. 877/653-4586; www.bearonsite.com.



40,000-gallon tanks

Crest Precast 40,000-gallon precast tanks can be used as septic, pump, recirculation or holding tanks. A concrete mix incorporates Xypex additive for watertightness and corrosion resistance. Various access manhole sizes are offered and tanks can be outfitted with aluminum hatch doors. The tanks are heavy and resist flotation. They can accept piping layouts to fit the site requirements without extra cost. 800/658-9045; www.crestprecastconcrete.com.



Effluent filter

The SaniTEE effluent filter from **Bio-Microbics** prevents floatables, FOG and solids from leaving the septic tank.

By promoting natural sedimentation and allowing the solids to slough back into the septic tank instead of collecting inside the filter housing, the unit resists blinding and clogging. Slip-in installation, clean-in-place maintenance with swabbing handles, angled slots, and keyhole weirs help deliver consistent flow. The filter is available in 4-, 8- and 16-inch diameters and fits residential, commercial and stormwater applications. 800/753-3278; www.biomicrobics.com.



Injection-molded tank

The durable IM-1060 tank from **Infiltrator Systems** is injection-molded for high strength in septic, pump or rainwater applications. Each tank half features a mid-seam joint that accepts an engineered EPDM gasket, creating a watertight structural tank. The lightweight, two-piece design makes the tank easy to transport and store. The tank halves are permanently fastened before installation using a series of non-corrosive plastic alignment dowels and locking seam clips.

Structurally reinforced access ports eliminate distortion during installation and pumpouts while reinforced structural ribbing and fiberglass bulkheads offer additional strength. The tank can be installed with 6 to 48 inches of cover and can be pumped dry. It has a working capacity of 1,094 gallons and is suitable for non-potable water collection and a range of applications, including shallow installation and multiple-tank configurations. The tank is available with the company's custom-fit risers and heavy-duty lids. 800/221-4436; www.infiltratorsystems.com.



Gravity filters

Gravity effluent filters from **Clarus Environmental** come standard with integrated bypass protection, and a secondary screen that continues to protect the outlet when the primary filter is removed for cleaning. The filters are available in residential and commercial sizes. 800/928-7867; www.clarusenvironmental.com.



Tank manufacturing

Hydra-Strip molds from **Norwalk Precast Molds** are available as one- and two-piece designs for a variety of applications. The system quickly and easily lifts the casting from the mold every time. The quality of the casting is increased and the life expectancy of the mold is prolonged. Easy to clean and maintain,



the molds reduce labor costs, lowering the time to strip a mold to as little as five minutes using one person. The two-piece mold set includes custom cast-in tees, baffles and compartment walls as integrated components. The process can also be used to collapse the core of the mold, enabling users to cast multiple-sized tanks. 800/251-8409; www.norwalkprecastmolds.com.

Wastewater management

The **Bio-Kinetic** wastewater management system (Model BK 2000) from **Norweco** improves the performance and operating life of new and existing septic tanks, aerobic systems, leachfields, sand filters, mounds, constructed wetlands, grease traps and oil interceptors. Using advanced treatment methods, the unit protects domestic treatment plants from hydraulic surges and solids washout without the use of electricity and with no moving parts. With three filtration zones and nine settling zones, the system converts septic tanks, tile fields, sand filters and other conventional treatment devices into an advanced treatment solution.

The unit uses six flow equalization ports to use upstream tank capacity, managing all heavy-use periods and hydraulic surges. With an unlimited design and installation flexibility, the unit serves a variety of applications. Installation is completed in a few hours. It combines filtration, solids retention and removal, flow equalization, optional chemical disinfection and simple maintenance for long-term performance. 800/667-9326; www.norweco.com.



Low-profile tanks

Low-profile, seamless septic tanks from **Norwesco** are available in 500-, 750-, 1,000-, 1,250- and 1,500-gallon capacities. The one-piece construction adds strength, eliminates leakage and requires no assembly, no special backfill, and no water-filling. 800/328-3420; www.norwesco.com.



Tank adapter

The **PRTA24-2** tank adapter from **Orenco Systems** quickly and easily casts into a concrete tank. The wide outer flange rests on the concrete so that the adapter is always set to the correct depth. The inner rib locks the adapter into the concrete for a sturdy tank-to-adapter connection. The adapter requires a single bead of adhesive in the riser channel to provide a watertight joint between the adapter and a 24-inch riser pipe, with no need for additional adhesive joints. 800/348-9843; www.orengo.com.



Risers and lids

Access risers and lids from **Quanics** provide easy access to septic tanks, dosing tanks and the company's basin assemblies. An interlocking design and neoprene gaskets reduce water intrusion. The material is UV protected. Stainless steel tamper-resistant screws help prevent unauthorized entry. Units are available in 22-, 26-, 30- and 36-inch diameters for concrete and fiberglass tanks. 877/782-6427; www.quanics.net.



Septic lids

RotoSolutions 24-inch septic lids are weight-rated for 3,500 pounds. They are made of heavy-duty roto-molded plastic that is lightweight and easy to install as a replacement for concrete covers. 800/868-0973; www.rotosolutions.com.



Pressure filter

The **STF-100A2** pressure filter from **SIM/TECH FILTER** helps maintain proper and efficient year-round operation of mounds, sand filters and other pressurized distribution systems. The filter also can be used for prefiltration for drip irrigation systems to reduce maintenance. The low headloss (0.21 psi) unit mounts on the discharge side of an effluent pump, preventing plugged holes and reducing effluent TSS. The mounting location extends the time between servicing.

The vortex action created by the pump scrubs the screen. Backflow through the filter after the pump shuts off washes debris back out of the filter. The 2-inch filter can handle flow rates up to 83.3 gpm. The 2-inch filters in manifold can be designed to handle almost any flow rate or load. Larger 3- and 4-inch filters are also available. The standard screen filters to 1/16 inch and optional stocks allow for additional filtration to 600 microns (0.024 inch), 190 microns (0.007 inch) or 100 microns (0.004 inch). 888/999-3290; www.simtechfilter.com.



Buried tanks

Dominator low-profile septic tanks from **Snyder Industries** can be buried without water for ballast and strength and can be backfilled with trash-free and free-flowing native soils. The tanks also can be used as holding tanks, and pump tank versions are available. They are available in capacities of 750, 900, 1,050, 1,250 and 1,500 gallons. Cistern versions are available in 1,200- and 1,700-gallon capacities. 402/467-5221; www.snydernet.com.



Fiberglass riser covers

Non-skid, kelp green fiberglass septic riser covers from **TOPP Industries** fit most 24-inch-diameter risers and corrugated pipe. The non-corrosive lightweight covers can withstand a 2,500-pound wheel load. The built-in cover gasket provides a watertight and gas tight seal. The covers are maintenance-free and impact-resistant and provide uniformity, dimensional accuracy and stability. Bolt holes are pre-drilled for quick and easy assembly with stainless steel hardware included.

The covers fit the company's risers and Ultra-Rib, spiral and poly tubes. Risers are available in 24- and 6-inch heights with 6-inch extensions available. Covers can be customized with company name and logo. 800/354-4534; www.toppindustries.com.





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Heavy-duty tanks

Extra-heavy-duty precast tanks from **Wieser Concrete** are designed for HS20 truck-traffic rating with openings, boots, interior walls, and baffles that can be customized depending on the application. The tanks have many applications and provide storage for water, grease, septage and stormwater storage and treatment. They can withstand 12 feet of cover-bury depth and are fabricated for high-groundwater conditions. Tank setting is available. 800/325-8456; www.wieserconcrete.com. □



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The Septic Tank as a Unit Process

Tank capacity, shape and placement all contribute to effective treatment of solids and long-term protection of the soil treatment area

By John R. Buchanan, Ph.D., PE.

According to the 1967 edition of the Manual for Septic Tank Practice, the primary purpose of the septic tank was to “condition” the sewage and to protect the drainfield from clogging. Conditioning was understood to mean separating the solids from the liquid.

Septic tanks provide this protection by creating conditions where materials that are less dense than water will float (scum) and materials that are denser than water will sink (sludge). Today, we have a better appreciation for the role of a septic tank in domestic wastewater treatment. Beyond protecting the drainfield, retention of solids provides significant wastewater treatment: The material held by the tank cannot negatively affect the environment.

Further, septic tanks help to normalize the flow to the soil absorption area, and allow for some breakdown of organic compounds. The ability of septic tanks to hold solids depends on tank size, shape and placement.

Size matters

To maximize settling (or floating), we must minimize turbulence within the tank. The capacity (or volume) of a septic tank needs to be large enough to make the inflow from a toilet or kitchen sink seem insignificant. A toilet flush may be three to five gallons and have a significant solids content. When this small amount of liquid enters a 1,000-gallon septic tank, the velocity of the incoming liquid is reduced nearly to zero. By removing the entrance velocity, there is almost no turbulence in the tank, and the process of flotation or settling can begin.

A second way that size matters is that when a small volume of water enters the tank, the overall effect on the water level is very small. For example, if a typical 1,000-gallon tank is five feet wide and 10 feet long, the water surface area is 50 square feet. If a toilet flush creates an inflow of five gallons, the water surface will rise less than 3/16 inch.

The rate by which water leaves the septic tank depends on the depth of water above the bottom of the outlet invert. This very small rise in the water surface provides a very small driving force to move water through the outlet. During the toilet flush, five gallons of wastewater enters the tank in less than one minute. A rise of 3/16 inch means the discharge of the five gallons will be slow and will result in just a trickle of water from the outlet.

Local and state agencies typically prescribe the minimum septic tank volume based on the number of bedrooms or on the design daily volume. Often, these specifications are based on a minimum volume of twice the

design daily flow. If the design flow is 450 gpd, then twice that volume is 900 gallons.

During design flow conditions, the hydraulic detention is two days – in other words, it would take two days for wastewater to move through the tank. The good news about this design approach is that most homeowners use less than their design flow, and wastewater may take five or six days to move through the tank.

The septic tank is an essential wastewater treatment component and is often poorly appreciated. In order to function properly, it must be sized and placed according to good construction practices.

This slower rate allows for even the smaller suspended solids to settle below the outlet baffle and become trapped in the tank. The two-day detention rule-of-thumb should be used as a minimum sizing standard for domestic and commercial applications. Depending on the solids content, even longer detention may be desirable.

Shape matters

Most regulatory agencies only specify septic tank volume. It is generally understood that a septic tank should be rectangular. A good rule of thumb is that the tank should be twice as long as it is wide. Length is measured from the inlet baffle to the outlet baffle. Liquid/solid separation improves as the distance between baffles increases.

The inlet invert should be two to three inches higher than the outlet invert. This distance allows for more scum material to rise onto the water surface. Inlet baffles absorb the inlet velocity energy and force the wastewater to flow downward.

Placement matters

A septic tank must be level and must be placed in a soil that will not settle beneath it. Any settling could allow the tank to tilt or crack. The effective volume is relative to the outlet invert, and if a tank is not level, the effective volume can be reduced, allowing solids to exit.

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The septic tank is an essential wastewater treatment component and is often poorly appreciated. In order to function properly, it must be sized and placed according to good construction practices. Further, it must be recognized that as solids accumulate in the tank, the process of liquid/solid separation is hindered. The tank must be pumped when about 25 to 30 percent of its depth is occupied by solids. □

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Ditch Witch launches maintenance program

The Charles Machine Works Inc., manufacturer of Ditch Witch construction equipment, introduced Orange Armor, a flexible planned maintenance program to help customers protect their equipment investment. The program is available through participating Ditch Witch dealerships.

PASEO honors Longwell for service

Gil Longwell, Onsite Institute director, received the Dean Shultz Outstanding Service Award from the Pennsylvania Association of Sewage Enforcement Officers for 25 years of service to the organization. The annual award is presented to a sewage enforcement officer who has demonstrated sustained commitment to the association. A former PASEO administrator, Longwell established the Onsite Institute and is a frequent contributor to COLE Publishing magazines.

Pentair restructures water disposal business

Pentair's Residential and Applied Waste Water pump business has been restructured as part of the broader Flow Technologies Global Business Unit realignment headed by Gary Witt, president.

Atchia, SJE-Rhombus recognized for technical leadership

Julian Atchia, director of engineered products for SJE-Rhombus, was recognized by the Hydraulic Institute for technical leadership and contributions to the creation of ANSI/HI standards. Atchia worked to update the standard for Rotodynamic Submersible Pumps for Hydraulic Performance, Hydrostatic Pressure, Mechanical and Electrical Acceptance tests, ANSI/HI 11.6-2011. The revised standard changes direction and represents a departure from the previous standard (ANSI/HI 11.6-2001) in that the submersible pump is guaranteed and tested as a complete close-coupled unit.



Julian Atchia



Pictured (from left) were participants of the SSPMA forum in Indianapolis. They included David Frame, Bob Frame Plumbing; Charles White, vice president of technical and code services for Plumbing Heating Cooling Contractors National Association; Jeff Hawks, Champion Pump and SSPMA's moderator; Stephen Pfendler, P.I.P.E. Inc., and William Ciriello, Wm. J. Ciriello Plumbing Co.

SSPMA welcomes Superior Pump, holds spring meeting

The Sump and Sewage Pump Manufacturers Association (SSPMA) welcomed Superior Pump of Minneapolis, Minn., to its membership. Superior manufactures sump, sewage, effluent, utility and backup pumps.

The association also held its spring meeting in February in Indianapolis. The program featured four plumbing contractor representatives from the Indiana Association of Plumbing Heating Cooling Contractors. Topics included industry trends, pump distribution, training and education needs for employees and time demands for handling service calls.

State, association replace septic for low-income family

The New Mexico Environment Department's Liquid Waste Program and the Professional Onsite Wastewater Reuse Association of New Mexico collaborated to help a low-income family in northern New Mexico fix their faulty septic system. POWRA-NM donated equipment, supplies and manpower to complete the replacement. Funding was provided by the Office of the National Resource Trustee. ONRT and NMED have an ongoing program to assist indigent households within the Middle Rio Grande Basin eliminate illegal cesspools or substandard household septic systems that threaten water quality and public health.

Quanics hosts June nitrogen reduction webinar

Quanics will host a free webinar, "Nitrogen Reduction Plain and Simple," from 1-2 p.m. EDT on June 20. The presentation will provide an overview of the technology, design requirements and management options necessary for the successful implementation of decentralized wastewater strategies. The webinar will be presented by wastewater professional Kevin Sherman. To register, visit www.quanics.net. □



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The SCS time adjustable pump control from SEewater Inc. has a built-in, eight-position dial that enables the user to select the desired pumping duration in seconds or minutes. The SCS switch replaces conventional float switches and will operate any pump up to 1 hp or 16 FLA. 888/733-9283; www.seewaterinc.com.



Hilti POL 10 optical level

The POL 10 optical level from Hilti is designed for checking elevations and transferring heights. Applications include pouring concrete, adjusting framework and setting grade stakes. 800/879-8000; www.hilti.com/us.



SJE-Rhombus EZ Series control panel

The EZ Series In-Site CL data-logging control panel from SJE-Rhombus connects to a laptop computer for system programming, monitoring and reporting. The panel can control one or two 120-, 208- or 240-volt single-phase pumps in water and sewage installations. It has a Modbus port on the inside door and connects to a Windows-based PC to download system events, including pump run times, pump cycles, alarm conditions, HOA settings, power outages and service calls. The In-Site software automatically formulates system data (up to 4,000 events) and reports for monitoring and correcting conditions. 888/342-5753; www.sjrhombus.com.



Gradall highway-speed excavator

The 5100 IV highway-speed excavator from Gradall Industries has a six-speed AutoDrive Allison automatic transmission and transfer-case that enables the excavator to travel up to 60 mph. Weighing 57,670 pounds, models are available with either a 6 by 4 or 6 by 6 drivetrain. Powered by a 6-cylinder, Detroit Diesel Mercedes OM926 Tier 4i engine (282 hp at 2,200 rpm), the excavator has a maximum reach of 33 feet, 9 inches at grade, full-tilting boom, maximum dig depth of 24 feet, 5 inches and maximum loading height of 18 feet. The rated bucket force is 24,900 pounds. 330/339-2211; www.gradallindustries.com.



John Deere K-Series backhoe loader

K-Series backhoe loaders from John Deere are available in eight models (310K EP, 310K, 310SK, 310SK TC, 315SK, 410K, 410K TC, 710K). Two economical tractor loaders (210K EP, 210K) round out the series. Powered by a certified IT4/Stage III B John Deere PowerTech engine, the K-Series features a 5-speed transmission for top road speeds of 25 mph. An AutoShift transmission is available. A single loader level with integrated electrohydraulic auxiliary loader control eliminates the need for a second level when using a multi-purpose bucket. 800/503-3373; www.johndeere.com. □



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Onsite Installer magazine is written solely for professionals who design, manufacture, engineer and install septic systems and other onsite wastewater treatment systems serving both residential and commercial onsite wastewater treatment applications.

Change of Command

The Wisconsin Onsite Wastewater Recycling Association elected as its new president Aaron Ausen, a civil engineer specializing in concrete engineering at Dalmaray Precast Concrete Products in Janesville.

Mark Wieser of Wieser Concrete Products in Portage was elected vice president and Roger Fanning and Len LaFrenier joined the board of directors. The association chose George Klaetsch as executive director and Klaetsch Public Affairs Strategies as its management firm and lobbyist. Erin Krueger is the association manager.

The Robert Lindner Memorial Scholarship was awarded to Kelly Anne Guyse, daughter of Tom and Sheri Guyse of TG Soil and Water in Lyndon Station. Brandon Arndt, son of Dale Arndt of Arndt & Sons Plumbing in Brooklyn, received the Gretchen McQuestion Scholarship.

Change of Command II

The Minnesota Onsite Wastewater Association board of directors elected Lori Ende president, Brian Koski vice president, Chris Le Clair treasurer, and Andy Winkler secretary.

The MOWA board and Minnesota Pollution Control Agency are working to create a general permit for pumpers to store more than 50,000 gallons of septage for short periods when fields are inaccessible.

The agency is creating educational material for homeowners and requests help from anyone interested in helping. The agency also needs certified people to help develop new certification to design and inspect Type IV systems with small flows. Contact Mark Wespetal at 800/657-3864 or mark.wespetal@state.mn.us.

Legislative Voice

The Onsite Institute in Mechanicsburg, Pa., invites industry professionals wishing to change the state's onsite laws to offer their proposals at www.onsiteinstitute.com/your-voice. Visitors will find the current law, which they can download, mark up, and return for submittal to a legislative committee. Proposals will be kept anonymous.

CALENDAR OF EVENTS

June 28-30

State Onsite Regulators Alliance, Captains of Industry, and National Environmental Health Association Conference, Marriott Marquis and Marina, San Diego, Calif. 800/624-8301; www.nesc.wvu.edu/sora.

TRAINING & EDUCATION

Point-of-Sale Fact Sheet

The University of Arizona Cooperative Extension released a four-page fact sheet on "What You Should Know When You're Having Your Septic System Inspected for the Transfer of Ownership Program." Although based on Arizona code, most material is generic and is designed to help buyers, sellers, inspectors, and real estate agents know their responsibilities before, during, and after sale of a home with an onsite system. The document is a free download at www.cals.arizona.edu/pubs/water/az1554.pdf.

Summer Soils Seminar

The Minnesota Onsite Wastewater Association has a soils seminar on

July 20. Contact Carla Tourin at 952/345-1145 or mowacarla@aol.com, or visit www.mowa-mn.com.

Alabama

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

- July 12-13 – Pumpers Class
- July 18-20 – Advanced Installer I Class
- Aug. 9-10 – Continuing Education Class, Guntersville
- Aug. 15-17 – Advanced Installer II Class

The first day of Continuing Education classes is for installers and the second day is for pumpers and portable restroom operators. Call the training center at 205/652-3803 or visit www.aowatc.uwa.edu.

California

The California Onsite Wastewater Association is offering a Low-Pressure Pipe Drainfield and Drip Dispersal Design class on July 26 in Chico. Call Kit Rosefield at 530/513-6658 or visit www.cowa.org.

Florida

The Florida Onsite Wastewater Association Training Center has an Operations and Maintenance A class on July 10 in Gainesville. Contact FOWA at 321/363-1590 or visit www.fowaonsite.com.

Georgia

The University of Georgia's Center for Urban Agriculture is offering an Onsite Wastewater Management class on July 26 in Gainesville. Contact the Continuing Education Center at 770/229-3477, conteduc@uga.edu, or www.ugarbanag.com.

Iowa

The Iowa Onsite Wastewater Association has its Site Evaluations and Soils course on Aug. 17 in Charles City. Contact Alice Vinsand at 515/225-1051, execdir@iowwa.com, or visit www.iowwa.com.

Minnesota

The University of Minnesota Water Resources Center has these classes:

- Aug. 7 – Soils Continuing Education, Willmar
- Aug. 10 – Soils Continuing Education, New Ulm
- Aug. 21-24 – Service Provider, St. Cloud

Call Nick Haig at 800/322-8642 or visit www.septic.umn.edu.

New England

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

- July 12 – Microbiology for Wastewater Professionals
- July 26 – Surveying Techniques for the Wastewater Professional
- Aug. 9 – Surveying Basics for the Onsite Wastewater Contractor

Call 401/874-5950 or visit www.uri.edu/ce/wq.

Oregon

The Chemeketa Community College in Salem has an Installer class on Aug. 15. Call 503/399-5181 or visit www.chemeketa.edu/busprofession/ccbi/customizedtraining/deq/classes.html.

Pennsylvania

The Pennsylvania Septage Management Association is offering these Onsite Wastewater Treatment System Inspection courses:

- July 17-18 – Advanced Onlot Wastewater Treatment System Inspection, West Chester
- July 25-26 – Basic Onlot Wastewater Treatment System Inspection, Chesterfield, N.J.

Call 717/763-7762 or visit www.pasma.net.

West Virginia

The West Virginia Environmental Training Center, in cooperation with the Bureau for Public Health and Department of Environmental Protection, is offering a Home Aeration Unit Operator Training & Certification class June 12-15 in Morgantown. Contact the training center at www.wvetc.org or 304/372-7878. □



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RETIRING AFTER 30 YEARS: Well established septic/pumper business. Located in lower Hudson Valley, Dutchess County, New York. Many accounts and area is growing rapidly! Serious inquiries only please. Call Brad: 914-447-5043, IL. (P06)

Septic Pumping, Install and Sewer Business for sale in central Wisconsin. Sunbelt Business Brokers. Call James Pieper: 262-498-1787. (I06)

BUSINESSES WANTED

WANTED: Looking to acquire septic businesses in Massachusetts. All inquiries will be confidential. 508-868-7627. (PIBM)

DRAINFIELD RESTORATION

Soil Shaker 2000. Universal skid steer attachment for drainfield restoration. Buy factory direct \$6,250. www.soilshaker.com or call 320-293-6644. (P1-12)

HAND TOOLS

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

JETTERS-TRAILER

2001 Sewer Equipment Company of America, model 747-FR-2000: 700-gallon polyethylene tank, water pump: 40 gpm @ 2000 psi replaced in 2007, includes automatic level guide and lateral kit. Call 856-478-4333. Asking \$12,000. (CMP106)

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. 1-800-536-5564. (IM)

SEPTIC TRUCKS

1991 Mack CH 613: 1998 Delzato unloader 7, 1,150-gallon tank, forms 1-1500 multiform. Truck: \$15,000, forms: \$3,500. 360-275-1996. (P06)



2003 Sterling L7500 Vac Truck: Cat 3125 @ 315 hp, A/T, 55K miles, spring susp., 2003 Vac-Con V390LHAD, 3 compressor fans, 10' telescopic boom, HS drive, articulating hose reel, hi-dump debris tank..... \$99,500
715-546-2680 WI BM

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