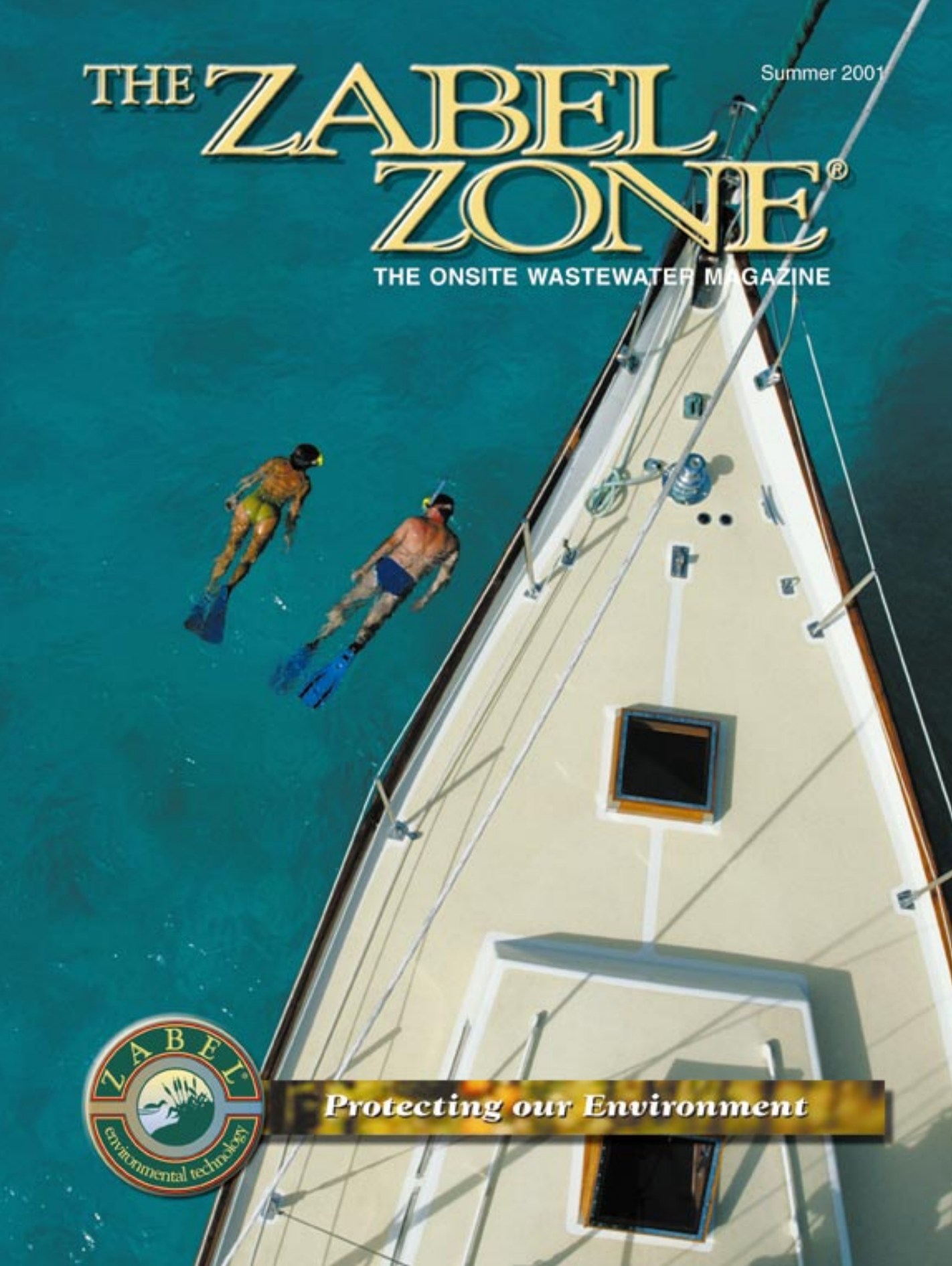
THE ZABEL ZONE®

Summer 2001

THE ONSITE WASTEWATER MAGAZINE



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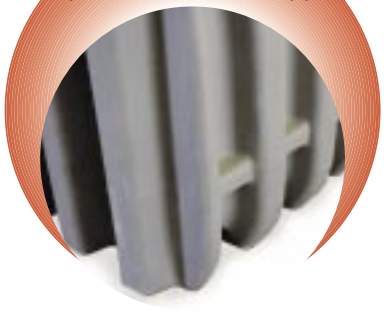

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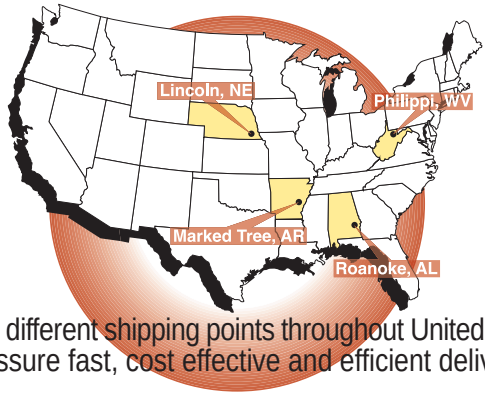

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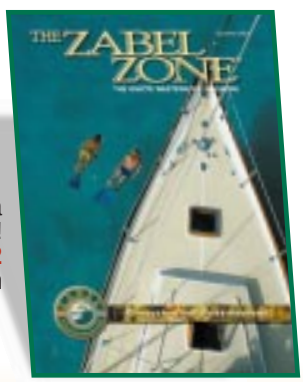

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Editorial Policies

The Zabel Zone® is published in three editions each year and contains articles of interest to the Onsite Wastewater Community as well as information on Zabel products.

The Onsite Wastewater Community does not exist in a vacuum, but is part of the larger culture. Articles may also appear of a general interest that do not directly involve onsite wastewater issues. Articles by guest authors reflect only their opinions and do not necessarily reflect the opinion of the editor.

Letters to the Editor will be published as space allows with the editor reserving the right to edit the letters for brevity and clarity. If you would like to contribute an article, please contact the editor at : Voice 1-800-221-5742 - Fax 502-992-8201, or - Email Jnurse@zabelzone.com

"Rebel Humor"

One Little Mistake

A young preacher was contacted by the local funeral director to hold a graveside committal service at a small local cemetery for someone with no family or friends. The preacher started early but quickly got himself lost, making several wrong turns. He arrived a half-hour late, the hearse was nowhere in sight, and the workmen were eating lunch. The pastor went to the open grave and found the vault lid already in place. Taking out his book, he read the service. As he was returning to his car, he overheard one of the workmen say: "Think we should tell him it's a septic tank?"

Found on the internet, author unknown

Editors Corner

Jan M. Nurse, DMD

It's tough being married to a genius. At least, that's what Harry tells me. Little joke there.

I can't believe this will be in print where I will no longer be able to deny it, but I am actually referring to my husband. He can, almost literally, do anything. He cooks, cleans and irons better than any male OR female I have ever met. He can read a book on something very complicated and apply it. When he sets his mind to it, there is almost nothing he cannot fix.

Now, here's the down side. He loves to tinker. Also, it is Spring. So, what is happening at my home? Someone is digging in my yard to install a new Zabel product. I can think of no new product, up to this point, that we have not tested. I don't mean lab tests, I mean your basic, day-to-day, 'can you live with this?' kind of thing. So far, so good, but I would love to have one year go by where it doesn't look like I've been burying treasure in my backyard.

So, would you like to know how wonderful Zabel Products are? Well, ask the genius' wife.

Zabel's New Addition
Congratulations

Larry Nourse's son (also Larry) and wife, Amy, announce the birth of their son on Saturday, March 31st at 12:52 a.m. Erik Bradford weighed in at 10 lbs., 3 oz. and 22" and joins big brother, Jared.

By Harry L. Nurse Jr.

Rebel's Corner

I felt the need to study the Bible with a group of men where we could talk freely about issues that concerned us and get direction from God's Word. I shared this idea with our Minister of Education, Robbie Battoe, and of course you know what happened! As I write this article, I am preparing to teach the fourth class in an eight-part series based on Charles Stanley's book, Protecting the Family for a men's bible study in my home.

As I was flying on a business trip before the first class, I was thinking to myself, I am not qualified to teach this class. I can't do this. I kept thinking about James 3:1 "Not many of you should presume to be teachers, my brothers, because you know that we who teach will be judged more strictly" (NIV).

I decided to change the subject and picked up Sidney Sheldon's classic, In His Steps and began to read. You may know the story. It's about a pastor who challenges his congregation to precede every action by the question, "What would Jesus do?"- then to do it. As the story goes, the pastor was feeling woefully inadequate to lead his people, as they would deal with hard questions without simple answers. How would he help them to know what Jesus would do? As he prayed and studied God's Word he read, "But when he, the Spirit of Truth comes, he will guide you into all Truth" (John 16:13a NIV). The words jumped off the page at me. I felt an immediate sense of calm and warmth. I knew I was not alone. In fact, I was not even going to be the teacher. The Holy Spirit would do it. All I had to do was present the ideas in the textbook, share the scripture and God Himself was going to teach us.

Could such a thing be possible?

We have now had three classes and this past Sunday morning one classmate said, "Harry, my spiritual life was dead and boring until our men's Bible study began. Now it is all fresh again." One man's wife said, "My husband loves the class. He came home excited after the last lesson and talked to the children and me about what he had learned and how God loved us unconditionally and he was going to love us the same way." Several others made similar comments about how their lives were being changed because of this study class.

I am still not the teacher. I am unworthy of such a title. But it is thrilling to lead this small band each week as we search God's Word together and experience the Holy Spirit teaching each of us how to be the husband and father He wants us to be.

Hallelujah, what a Savior!

Tom Petty/Zabel,

Great job with Septic Systems class at Owensboro today. Enjoyed and learned alot.

Thanks again, “Keep up the good work!”

Sincerely, Roger C. Basinger HE IV, BS, RS
GREEN RIVER DISTRICT HEALTH DEPT.
HANCOCK COUNTY CENTER

Union County Health Department
Serving the Union County General Health District

December 19, 2000

Zabel Environmental Technologies
P.O. Box 1520
6244 LaGrange Road
Crestwood, KY 40014
ATTN: Mr. Joe Mattingly

Dear Sir:

Your presentation on Filter technology to the installers of Union County was very informative. The information will go a long way toward convincing those installers that filters will increase the performance of systems they install.

The time and effort in making our class a success is sincerely appreciated.

Thank you again for all you have done.

Sincerely,

Paul Pryor, R.S.
Director of Environmental Health

Dear Zabel,

I enjoy your publication "The Zabel Zone". I read it from cover to cover. I am a Registered Environmental Health Specialist in South Carolina employed by The SC Dept. of Health and Environemntal Control. I have been employed by DHEC for 20 Years specifically in wastewater. SC is slowly becoming involved in the new technology I enjoy reading and learning about this new stuff. Your pump info is very useful as I design pump systems daily. Gotta go, keep up the good work.

Heyward Mattox, REHS
South Carolina

Dear Joe,

This in response to our phone conversation this morning regarding a donation for our annual customer appreciation dinner for our septic installers. Zabel has been very generous in the past and we hope you can help us again this year. The dinner is scheduled for March 6th and we expect another good turn out. If you would let us know as soon as possible if you can help us again, I would appreciate it.
On another note. I would like to extend my congratulations on another interesting issue of The Zabel Zone. As a Certified Soil Scientist and a Licensed Site Evaluator here in Maine, I appreciate the technical information on the "Tools of the Trade" and timely issues regarding subsurface wastewater disposal. I have been involved in system design for over 25 years and the technology is changing every day. Your publication is an excellent resource for information. I also enjoy the personal touch with information on your staff. The ad for Aerocell with the "Smaller Footprint" was great, love those toes.
Keep up the good work!!!

I look forward to hearing from you soon.

Paul A. Beers, CSS, LSE
Precast Concrete Products of Maine
Topsham, ME.

Hi Jan!

Thank you for the nice comments in your "Editor's Corner" and for the publication of "The Pumper Phenomenon" article in the Spring issue of The Zabel Zone. Both pieces reflect thoughtfulness and generosity. We, at COLE Publishing appreciate the work that you and your colleagues do.

Hope to see you in Nashville!

Tom Rulseh

DRIP Systems for Wastewater Disposal

Drip systems are making an important contribution to the onsite wastewater industry. They offer many advantages when compared to conventional-type systems, allowing them to be used effectively on restrictive sites and as repairs to failed systems. If you haven't been exposed to them yet, it's worth making the effort to learn more. They could help solve the next onsite problem you run into.

Most manufacturers, designers, and regulatory authorities require an advanced treatment unit when using a drip system. Advanced treatment units produce highly treated effluent, which helps protect the small drip line orifices from plugging. The cleaner effluent is also much easier for the soil to accept and process since the treatment device has accomplished the majority of the treatment. Many advanced treatment systems are available, most of which offer very reliable performance as long as they're maintained properly. Extended aeration systems, rotating biological contactors, and fixed media systems are common types of advanced treatment systems. We have recently introduced an artificial media system, the AeroCell™ ATS and an extended aeration system, the AeroDiffuser™ ATS, both of which are used with drip systems.

Once the effluent has been treated, it flows to a pump basin, which is sized to allow for peak flow storage. Turbine effluent pumps are used to dose the drip system because they overcome high total dynamic head (TDH) and produce low gallon per minute discharges (GPM), both of which are common requirements to drip systems. Timed dose electrical panels are used to control the on/off cycles of the pump because they allow it to be programmed to turn on and off at specific intervals. This flexibility provides for small uniform doses of effluent to the soil over a twenty-four hour period.

Filters are used inline to the drip system to remove small solids to further protect the small drip emitter orifices. ZABEL® offers a variety of filter types for drip systems. They should be considered a standard component in the design. If not, the drip line may plug over time. Filters and drip line tubing must be cleaned periodically to ensure long-term performance. Some designers prefer automatic flushing while others prefer manual flushing. Cost is often the deciding factor, since automatic flushing typically requires a more expensive control panel or a programmable logic controller (PLC). PLC panels use a micro processor to open and close remote solenoid valves, which redirects flows for flushing cycles. They can also control remote valves to alternate doses to multiple drip fields or zones are used.

There are two types of drip line tubing widely used; *non-pressure compensating drip line and pressure compensating drip line*. Non-pressure compensating drip line discharges effluent at slightly different rates when the pump pressure or PSI is different throughout the system, such as in varying elevations within or between lines. Pressure regulators are used to maintain a consistent pressure of 20 PSI to minimize the differences in discharge rates. Pressure compensating drip line discharges effluent at the same rate even with varying elevations.

This is helpful when a site has uneven topography or steep slopes.

Drip systems are very space conservative, which allows them to be installed on lots that have little usable area, separated usable areas or steep slopes. Individual lines can vary in length and placement to make use of odd or irregularly shaped areas. Multiple zones can be used to make use of many small areas on the lot. The amount of drip line is typically based on the total daily wasteflow and the soil loading rates. ZABEL and/or state and local authorities have specific loading rates to follow. **To calculate the total drip line**: divide the daily design flow by the assigned soil loading rate to arrive at the square footage requirements. Then divide the square footage requirements by 2 foot line spacing to arrive at the total drip line (i.e. 360 gpd/0.15 gallons per sq ft per day/2 ft line spacing =1200 feet of tubing).

Typical drip line installation depths are six to eighteen inches with lines spaced twenty-four inches apart. Vibrating plows used for phone line or cable TV installations are commonly used to install tubing. Other types of equipment use a small plow or turf knife to open the soil while the tubing is guided into the opening. This equipment is mounted on a tractor or machine with a three point hitch to control the installation depth.

Since drip systems can be installed at shallow depths, they are ideal where shallow soil restrictions are encountered. This includes heavy clays, shallow rock, water tables, fragipans, and other restrictive horizons. Shallow installation depths maximize the vertical separation distances between the tubing and the restriction, which greatly aids in maintaining free drainage and aerobic conditions. Shallow installations also place the drip line in the most permeable soil while taking advantage of evapotranspiration from grasses and other landscaping plants.

Installation at the Florida Training Center. System Includes: Two tanks to a 10 module AeroCell ATS, then to a dripline bed.

Drip systems are very useful and extremely flexible when encountering the many difficulties arising on poor sites. They should however, be used as another tool and not as a cure all. So far I've yet to meet that system. All systems have advantages and limitations, the real challenge is to learn as much as you can about all of them and choose the correct system for the correct application. Please contact us if you have any questions about ZABEL's drip irrigation system or any of our other systems. We'll be glad to assist with design and application questions.

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Back to the Future

By Ken Awtrey

The Pineywoods Resource Conservation and Development Council (RC&D) functions as part of the USDA - NRCS program to promote economic development through the conservation of natural resources. Six years ago one of the most vital and easily degraded natural resources in the Pineywoods of Texas was fresh water. With population growth booming in the area, failing on-site septic systems seemed to be a serious cause of degrading this natural resource.

We needed a low cost and very low maintenance technology to offer the rural public. Punitive regulatory threats do not motivate the masses, but good market driven technology does. Given the choice, a vast majority of citizens will improve their lots. What all of us would like, really, is a "flush and forget" system.

It didn't appear that mechanical systems were headed in that direction.

We began to look into "natural" systems that were gravity fed, and suited to our climate. The way nature seems to have handled waste treatment for centuries through natural wetlands appealed to us. No mechanical parts or power were required in most cases. Waste treatment with plants gave good quality effluent and folks got a garden in the bargain. Drainfields could be reduced and the savings actually offset the cost of the wetlands. We were not surprised that the way to the future was back--to nature.

For six years now, the Pineywoods RC&D has written grants to demonstrate the efficacy of wetland technology and to develop a market driven capacity of designers and installers. Now when the public wants a more natural, gravity driven treatment system, they can have one.

Our most important grant was a three-year project supported by the EPA through the Texas Natural Resources Conservation Commission (which oversees all on-site regulatory efforts and innovation). The grant money allowed us to bring in the world's leading experts to train local engineers how to think about wetlands and wastewater treatment design using natural wetland processes. The big question was how to create a design and permitting process that would apply to all sizes and situations that did not have a "one size fits all" restriction.

There is a formula that was created by the leading experts and promoted by the Water Pollution Control Federation that seemed to fit the bill. Our grant then, was designed to test this formula in Texas on wetland systems all the way from single family up to large, discharge systems. We paid two engineers to take the formula as the basic design guide and create five demo wetlands--two single family systems, two medium sized on-site systems, and one discharge system of 10,000 gallons per day flow for a rural school.

Every one of these demonstration systems performed extremely well. We had an independent ISO 2000 laboratory take samples and report performance for nearly two years. All five systems beat the predicted treatment goals without exception.

Excited by our success, we wrote a manual for each sized system and one for the plants that we used. The project paid for four manuals that are available now to the public at cost.

Volume I will take an on-site design for single-family homes through a very simple design process, share what to expect in getting such a system permitted (in Texas), and then some suggestions for construction materials and costs.

Finally, of course, some of our experiences in operations and maintenance are noted. Volume I has a nice full color centerfold of many on-site wetlands in East Texas.

Volume II follows the same outline for larger on-site treatment such as mobile home parks, or small collection systems.

Volume III reviews the same steps for a municipal discharge design. Of course, this type of system has much more regulatory control and complexity to it, but the basic design sizing formula and environmental accounting were the same.

Of course, everyone wants to know what plants to use and how they work and are maintained. We put all that information with a full color plant identification section in Volume IV. You can get the whole set or just the ones you want by calling the RC&D at (936) 568-0414.

Editor's Note: FYI-Zabel Filters were used in all 5 installations.

INSTALLING CONFIDENCE

By Ted J. Rulseh

Could mandatory **septic tank effluent filters** make regulators more receptive to onsite treatment systems?

The Spring 1996 edition of *Pipeline* magazine from the National Small Flows Clearinghouse emphasized the need for effective management of onsite wastewater treatment systems. It reported that state regulators have more confidence in centralized treatment systems because "they have centralized management and oversight and centralized operation and maintenance." Onsite systems, meanwhile, are often perceived by regulators as being less reliable. In large part, that is because homeowners as a class have a track record for mistreating and neglecting the systems they are supposed to maintain.

At least one player in the onsite industry thinks there may be a simple way to start changing that perception. Harry L. Nurse, Jr., president and CEO of Zabel Environmental Technologies, believes that a regulation requiring filters on septic tank outlets could go a long way toward ensuring the reliable system performance regulators desire. He shares his views in this Pumper interview.

Pumper: What are the requirements for an effective onsite treatment system?

Nurse: Most industry professionals agree there are three keys to proper onsite system operation: design, installation and maintenance.

A proper design usually accounts for environmental factors such as climate, topography and soil conditions; type of use (residential, commercial or industrial); the nature and strength of waste; and hydraulic loading of the system.

Technologies are available to design a system to suit most sites, and professionals in the field have enough design know-how to determine when an onsite system should not be used. More and more states now require designers to pass specific courses and take continuing education seminars to be certified for onsite system design.

Good installation, meanwhile, depends on training and monitoring installers to ensure that systems are built as designed. Neither a conventional septic system nor an advanced system with complex mechanical components will provide the necessary treatment unless a knowledgeable installer follows the design requirements. Again, many states are beginning to require installer training and certification.

Pumper: So that leaves maintenance. Why is that such a concern?

Nurse: Maintenance is clearly the weak link in the management chain. Service personnel can and should be certified in the skills needed to monitor and maintain systems. Some states are headed down that road, and more will soon follow.

Still, at present, it is usually the homeowner who decides when and whether to service a system. This reliance on a non-professional for service decisions is the biggest reason governments are reluctant to view onsite systems as attractive alternatives to centralized sewer systems.

In turn, the lack of reliable maintenance on conventional systems makes regulators suspicious of more sophisticated onsite technologies. For example, the main barrier to the acceptance of aerobic treatment units is the problem of assuring long-term maintenance beyond the two years required under NSF Standard 40 certification.

Aerobic manufacturers are reluctant to voluntarily increase their required service commitment of two years because they feel it puts them as a cost disadvantage with conventional and other onsite technologies, which in most states do not have any enforceable service requirement.

Pumper: What exactly are homeowners doing wrong, and why?

Nurse: Concern over maintenance of conventional systems comes consistently in seminars involving onsite professionals. Homeowners do three things that interfere with septic system performance: They put things in the tank that don't belong, they hydraulically overload the system, and they neglect maintenance. When does the typical homeowner have a system serviced? Regulators and industry people agree the answer is: When it backs up.

One possible remedy is to write a code that requires systems to be inspected and serviced every three to five years. However, states hesitate to take that approach, in part because enforcement would be difficult. An alternative is homeowner education, but that would be impossibly expensive, and who is to say it would work? Let's face it. Most homeowners have many priorities in their lives other than pumping their septic tanks.

Pumper: What do you propose as the solution?

Nurse: Managing the homeowner is the key to managing onsite system maintenance. So, how do we manage the homeowner? I think the answer is to manage system maintenance by requiring wastewater filters in all systems that include septic tanks. To require a wastewater filter on the septic tank outlet is to manage the homeowner.

Pumper: How could a simple septic tank effluent filter have such an impact?

Nurse: Roger Machmeier, the Septic System Answer Man columnist in *Pumper*, calls the septic tank effluent filter one of the most significant developments in the world of onsite treatment in recent years. I think he's right.

Suppose a filter as added to a residential septic tank. If the homeowner discards inappropriate material in the tank, the filter keeps it there. Sanitary products, hair and cigarette butts also stay in the tank. If the homeowner dumps bleach or some other caustic, the filter won't remove it but will protect the field from excess solids until the tank recovers. If the homeowner puts grease in the tank, the filter keeps most of it out of the field.

If the homeowner overloads the hydraulic flow, not allowing the normal 24-hour retention time, the filter protects the field from solids carryover. Finally, if the homeowner neglects maintenance until the system backs up, the filter protects the field and slows the system down, assuring system maintenance before there is a system failure. During the period the system has slowed, the homeowner has ample opportunity and warning to have the system serviced.

Pumper: What happens if the filter plugs? Isn't that going to cause a messy problem for the homeowner?

Nurse: Not if the filter includes a bypass that operates when the filter body plugs. And the system can be designed so that even when a bypass occurs, unfiltered material is not allowed to leave the tank.

Pumper: Are you saying that wastewater filters solve all maintenance management problems associated with onsite systems?

Nurse: No. Systems that use conventional septic tanks and filtered pump vaults benefit the most. Furthermore, wastewater filters do not solve problems of poor siting or poor design. They cannot correct problems caused by poor installation.

However, once a system is correctly designed and installed, a filter is the only passive system that assures system maintenance before an expensive and catastrophic failure caused by overloading of suspended solids.

Pumper: How does all this affect regulators' attitudes toward onsite systems?

Nurse: Filters give regulators a good assurance that more systems will operate reliably and that system failures will be much less common.

It will take time for states to implement the programs and training needed to ensure adequate onsite system design, installation and maintenance. In the meantime, if an inexpensive wastewater filter is required in every septic tank, system maintenance will no longer depend entirely on the knowledge level and interest of homeowners.

At a low cost per system, effective and timely septic system maintenance can be virtually assured. Once that happens, perhaps state regulators will look more favorably upon onsite systems as economical alternatives to city sewers.

Note: Roger Machmeier is the 'mac daddy' of septic systems and ALL you regulators and contractors should listen to him!

Article re-printed from the *Pumper* Magazine, with consent of Cole Publishing.

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It's the Soil, Stupid!

Adequate Sizing of Drainfields

By Theo B. Terry, III, RS

When I was a kid, I had a wooden baseball bat. Not one of the aluminum bats like my kids use today.

With that great wooden bat, I spent many an hour tossing a baseball up in the air and hitting it. I eventually cracked the bat, so I went digging around in my father's toolbox until I found a roll of black electrical tape to repair it.

As was inevitable, the crack kept getting worse, and there came a time when the tape just wasn't holding my bat together anymore.

Like my old wooden bat, there are problems with the onsite wastewater industry that can't be fixed without developing new standards. Just as we've advanced to aluminum bats, we have to advance to a new way of sizing drainfields. Here is the problem as I see it: The conventional system (i.e. a rock and pipe drainfield) is the standard by which all other drainfield options are measured.

But consider this: do we have an ever-increasing rate of failure for conventional drainfields? I believe the answer to that question is a definite "Yes!" I have come to the conclusion that the design of septic systems today leads to inevitable failures.

The very nature of our residential wastewater has changed. Think back to when you were growing up. I'll bet most of you lived in a household very similar to mine. Our home had only one bathroom, a kitchen sink without a garbage disposal, and let's be honest here, a washing machine that may not have discharged into the septic tank and drainfield. Probably 99% of our meals were home cooked with plenty of vegetables, with none of the greasy fast food we live on today. And I'll bet your mom, like mine, kept a Crisco can under the sink for her used cooking grease, rather than pouring it down the kitchen drain.

As a regulator, I used to hear aging homeowners say all the time, "I've had a septic tank and drainfield for 30 years and haven't had to do a thing to it. It works just fine!" But once that house was sold, and a young couple moved in, within a couple of years the system failed.

I'm here to tell you, the sizing formula for rock and pipe drainfields isn't adequate to handle the strength of waste coming out of today's residences. And we're using this as the standard for how we size all other treatment and drainfield options!

In today's onsite market, we now have Advanced Treatment Systems, which do address the real issue of treatment. Independent research has shown that once you've achieved higher effluent quality, you do not need as much soil contact to disperse the same amount of wastewater.

Products intended for the onsite wastewater industry should be rated on their own merit, not compared to a standard that is inadequate for today's usage. Manufacturers should provide the regulatory community with a suggested sizing chart for their specific product, based on its application rate based on soil types and/or perc rates. At the same time, the regulatory community has to address the issue of inadequately sized rock and pipe drainfields.

Drainfields can no longer be viewed as disposable commodities-the majority of homeowners cannot afford that. We must develop and sell products that provide high quality treatment, combined with the durability needed by the homeowner.

ULTRAVIOLET WASTEWATER DISINFECTION

By Ken Moody

The public health concerns for biological control of wastewater has caused a change from the use of chemicals for disinfection to use of ultraviolet radiation, a more environmentally-safe method. This technology has been around for over 50 years, but only in the past few has the onsite wastewater industry considered its use.

The use of chemical disinfection in wastewater has long been a worry to the public and local health officials have been concerned about a bi-product of chemical killing methods (trihalomethane) being left downstream of the wastewater. In contrast, ultraviolet radiation adds nothing to the waste stream except energy in the form of light rays. Ultraviolet radiation is a physical form of destruction; chlorination is a chemical way to destroy microorganisms.

How does ultraviolet radiation work? UV light is a form of radiation that can't be seen by the human eye. It is in an invisible part of the electromagnetic spectrum. To produce ultraviolet radiation, low-pressure mercury gases in quartz crystal are ignited between two electrodes with a large current of electricity. There are three categories of UV radiation based on their wavelengths: UV-A, UV-B and UV-C. UV-C is of shorter wavelength (in the range of 254 nm) and is capable of the destruction of DNA in pathogens.

One of the problems with the use of any disinfection unit for wastewater is the lack of a standard to test for effectiveness. Some on the market today have been tested in conjunction with wastewater pretreatment devices, under NSF Treatment Standard 40, with great success. Also, NSF Treatment Standard 46, to include wastewater disinfection, has been drafted and is in the process of being adopted. With this new standard, testing will show which disinfection units work-something that has been much needed in the on-site industry to protect the public from health dangers.

In most types of disinfection units, the effluent must be pretreated to insure the disinfection method can obtain maximum performance. Investigations in many areas have shown a surprising number of on-site pretreatment devices are not properly disinfecting wastewater.

This brings us to another advantage of UV radiation for disinfection. Reports show, inspectors have suggested the problem may involve faulty equipment, the use of an inappropriate type of tablet in chlorinators, or a general lack of maintenance (a very important part of any disinfection system). With ultraviolet disinfection, there are no tablets to add. The manufacturers of some UV units suggest maintenance every six months, but this is very simple. It requires only that the lamp-quartz tube be removed and cleaned by wiping with a clean cloth and water and at least every two years, replace the lamps as they begin to lose their effectiveness.

In general, the use of any disinfection unit is needed, but it must work properly.

Ken Moody
President
UV "The Disinfector", Inc.
www.onsitewtc.com

Self Cleaning Filtered Pump Vaults

By Harry L. Nurse

Everyone can see the future once you get there.

The trick is being able to see it from afar. Effluent filters have gone from no one using them to being required in over three hundred counties and a dozen states. Tens of thousands are sold on the recommendation of the regulatory community.

When I first worked to get a filter regulation, I was told it was impossible. Now conventional wisdom says that all fifty states will eventually require them. So, now it looks easy.

There is no doubt that the septic filter is the single best investment a homeowner can make for improving the performance of their conventional gravity system by keeping solids in the tank where they continue to digest while protecting their drain fields from clogging. Not satisfied with the simple cartridge septic filter, Zabel® builds a variety of filters to meet specific commercial and industrial needs such as grease, hair, and lint for use in restaurants, kennels, and laundromats. Our filters are also used in food processing and wineries.

What is the future?

ZABEL introduced our first filtered pump vault utilizing the A100 disc dam design in the Spring 96 ZabelZone®. Since then, we have introduced twenty-two different models ranging in length from 34 to 72 inches and featuring such unique patented features as removable filtered side panels and our brand new self-cleaning models. We have a filtered pump vault for every possible application.

Like their gravity filter cousins, filtered pump vaults protect gravity and pressurized disposal systems from excess solids. Also, many advanced treatment system manufacturers require either a gravity filter or a filtered pump vault in the septic tank to protect their system from solids overload.

The time will come that no one would ever install an onsite wastewater system, conventional or advanced, without protecting it with either a gravity filter or a filtered pump vault. One day, all fifty states will require them. And there is a ZABEL filter model designed for every application.

If He Only Knew

By Harry L.Nurse, Jr.

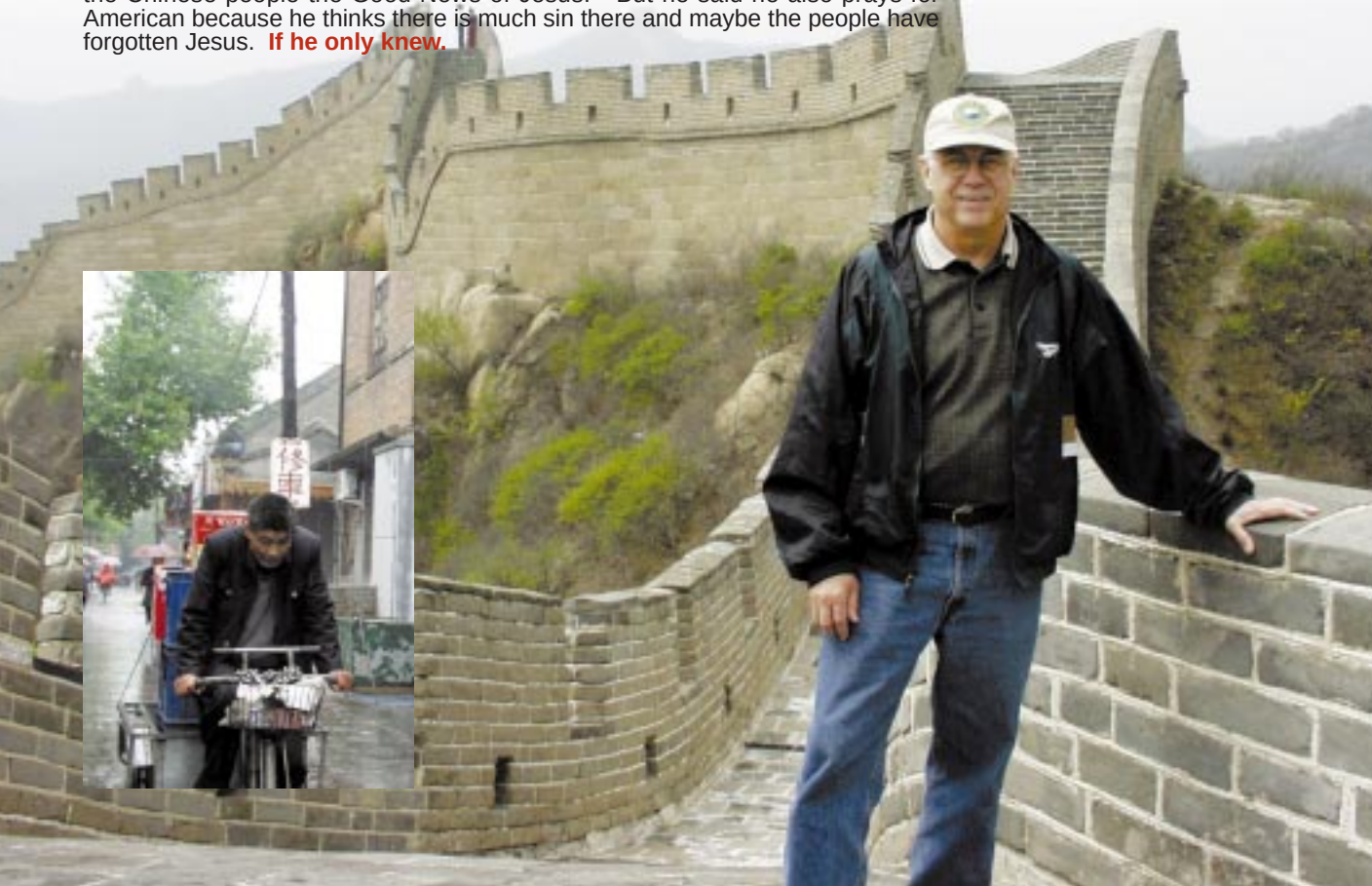
On April 30, I returned from a 19-day trip to China, thanks to the invitation of Bob Pullen of ABS, Australia. It was the experience of a lifetime, but in this short article, there are two specific things I want to tell you about: the children and the churches.

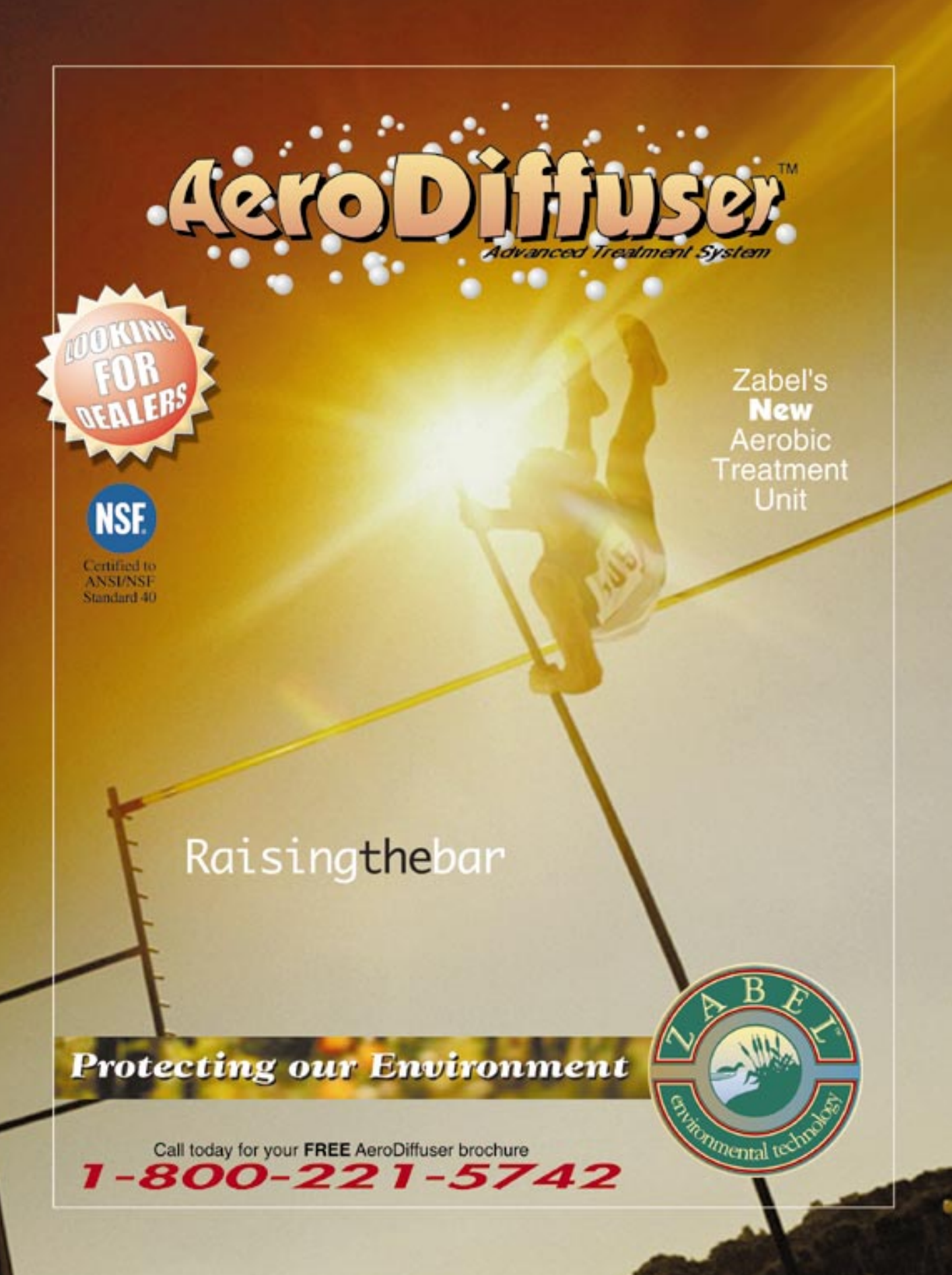
The children are beautiful and you can see from the accompanying photographs that more than one proud parent was happy for me to take their child's picture. There isn't much I can add to those pictures, but to say how they touched my heart.

The most moving thing, however, was the churches. I worshiped in two churches in Shanghai and one in Beijing. There are only five official churches in Beijing, a city of over 10 million souls. In Shanghai, a city of about 18 million, the churches are packed every Sunday. Easter Sunday, I sang 'He Arose' with all the meaning it had for me in a congregation of Chinese worshipers who know what it costs to follow Jesus Christ (Yea-sue Gee-to in Chinese).

The government cameras recording the service are a constant reminder that a price greater than the loss of a university education or a good job could be paid once again. I was humbled and felt unworthy to worship with those who have paid so much for what I take for granted.

Peter, a Chinese Christian said, "I pray to God and thank Him for America sending the Chinese people the Good News of Jesus." But he said he also prays for American because he thinks there is much sin there and maybe the people have forgotten Jesus. **If he only knew.**




AeroDiffuser™
Advanced Treatment System
LOOKING FOR DEALERS
NSF
Certified to ANSI/NSF Standard 40
Zabel's New Aerobic Treatment Unit
Raisingthebar
Protecting our Environment
ZABEL
environmental technology
Call today for your FREE AeroDiffuser brochure
1-800-221-5742

Zabel® Raises the bar

In Suspended Growth Aerobic Treatment

The difference between winning and losing can be one one-thousandth of a second, a few inches, or a tenth of a point. Those who win are the individuals that go that extra distance and push themselves the hardest. Zabel has always pushed to be the best and go that one step beyond the industry standard. We do not settle for status quo or a "me too" philosophy. We push the envelope and look for ways to innovate and improve because we know that is what our customers, regulators, and competitors have to come to expect.

Zabel is "Raising the Bar" in Aerobic Treatment by incorporating innovative design improvements, better warranties and the highest quality products into the AeroDiffuser™ Aerobic Treatment Unit. AeroDiffuser is an extended aeration, activated sludge treatment facility for wasteflows up to 500 gallons per day. Certified to NSF Standard 40, the AeroDiffuser produces secondary quality effluent from a high quality 100% fiberglass tank. Every AeroDiffuser contains our high quality ZEUS™ Risers and Lids to provide water resistant, durable, and tamper resistant access for servicing. Another ZEUS Basin and lid house the AeroDiffuser Control Center, containing the air compressor, wiring, and alarms and pump controls. Each unit is protected by the best parts warranty in the business- three years. This is beyond what is required of us; however, we feel you should stand behind your products and go that extra distance.

In a perfect world, all Aerobic Treatment Units would perform consistently no matter how the homeowner abuses them. Unfortunately, we all know this is simply not the case. Homeowners do abuse their systems, they fail to renew their maintenance contracts, and they unplug their air compressors. AeroDiffuser is available with a world renowned Zabel Filter installed directly in the clarifier of the unit. This filter, under normal operating conditions, should receive very little, if any, solids accumulation. However, when the homeowner begins their abuse, the power goes out, or the compressor is unplugged, that filter will provide the insurance needed to reduce the likelihood of solids escaping and clogging that expensive disposal field.

All of these improvements and attention to detail are our way of setting a new standard for Aerobic Treatment. We are taking ourselves and those who wish to join us to the next level. "Raising the Bar", don't you love the way that sounds? Isn't it better than "me too" or "because that is what everybody does"? Do you want to join us? Do you want to elevate yourself, your company, and your county? We are looking for dealers, distributors and maintenance personnel, but only those of you who are willing to push yourself to the limit and out perform all others.

AeroDiffuser DEALER Training

The training on the proper installation, operation & maintenance will be held at the Zabel home office 6244 Old LaGrange Road, Crestwood Ky. Space is limited so call ahead to reserve your spot.

1-800-221-5742 ask for Vanessa

June 12, 2001
July 17, 2001
August 14, 2001
September 18, 2001
October 16, 2001

By Brian Borders, RS

Zabel®...there is no comparison!

Call today for our complete line of Onsite Wastewater products!

1-800-221-5742

NSF Certified to ANSI/NSF Standard 46

The product(s) shown are covered by U.S. and Foreign patents

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FilterTee

By Theo B. Terry, III, RS

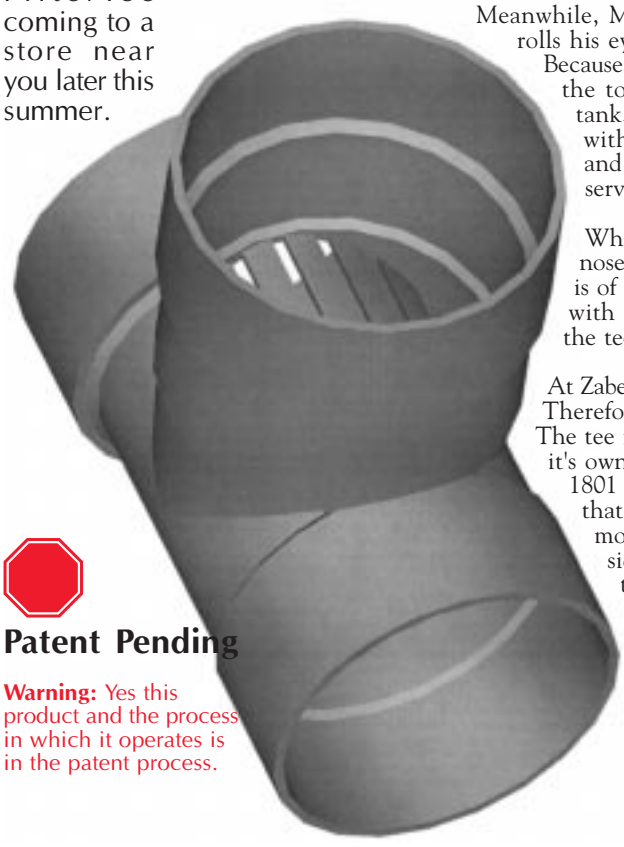
Remember the scene from the movie, "Raiders of the Lost Ark", where Indiana Jones encounters the Arab swordsman in the marketplace? Jones has already made several escapes as he runs through the narrow alleyways, but screeches to a halt as the burly Arab comes into view, brandishing his scimitar with a flourish of fancy moves designed to intimidate Jones with his skill. The action stops as Jones watches his opponent's posturing, then resumes as he shrugs, pulls out his pistol, and dispatches his foe with one quick shot.

I love that scene! It reminds me of the posturing a couple of onsite companies have been making over the issue of solids leaving the septic tank when the filter is pulled for cleaning.

One company touts their superior design--the use of a ball as a shutoff device, which stops the flow of effluent from entering the tee from the **bottom** when the filter is pulled from the septic tank. But the problem is, this design in that situation then allows the scum layer to flow over the top of the tee and out to the drainfield. If the filter cartridge is not replaced, (as we all know is sometimes the case in "the real world"), overflow of the scum layer will continue, leading to premature failure of the drainfield.

Another company has come up with the concept of two effluent filters locked together. The idea for servicing the filters is that you turn and unlock the two filters, and initially pull only the innermost filter for cleaning. Then you are supposed to lock the two filters back together and pull both of them for cleaning.

Editors note: Look for the new Zabel FilterTee coming to a store near you later this summer.



Meanwhile, Mr. Pumper, out on a service call, just shrugs his shoulders, rolls his eyes and drops in the hose from the truck to pump the tank. Because, as we know, until he pumps the tank down to a level below the top of the outlet tee, he doesn't know which filter is in the tank. Most of the extended handles for effluent filters are made with a half-inch PVC tee and pipe. He doesn't know to twist and pull (or is it pull and twist?), he simply knows he needs to service the septic tank. His answer is simply to pump the tank.

What both of these companies have missed is as obvious as the nose on my face. The "problem" (and I say that loosely, since it is of little consequence to begin with), lies not with the filter, but with the **tee baffle**. The filter has done its job. It is now up to the tee baffle to perform.

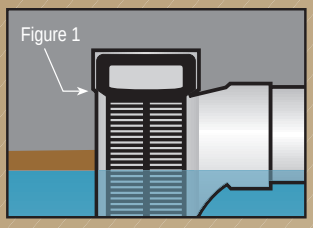
At Zabel, we don't look to add bells and whistles to our line of products. Therefore, we've designed a **new tee baffle** for the onsite industry. The tee is designed specifically for use in a septic tank. It comes with it's own built-in filter screen on the outlet side. Each time a Zabel 1801 filter is either removed or inserted into the tee, it sweeps clean that special filter screen. However, the tee also is available in a model without the filter screen, specifically for use on the inlet side of the septic tank. Our new tee baffle also accepts both thin-wall pipe and Schedule 40 four-inch pipe.

Don't be distracted by all the "posturing" and gimmicks out there. Look to Zabel for **real** solutions to all your onsite wastewater problems, both big and small.

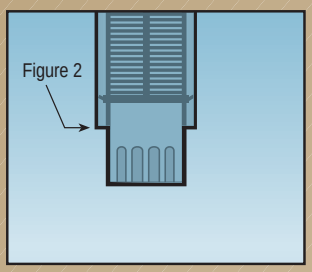
Patent Pending

Warning: Yes this product and the process in which it operates is in the patent process.

Difficult Installations Made Easy



Now, with our full line of accessories and proven techniques developed in the field with contractors, pumpers, installers and the Zabel™ Team, there are easy solutions to difficult installations. Use one of the following techniques to install any model of Zabel Filter.



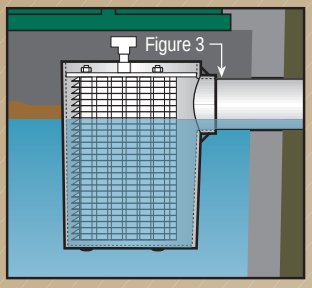
Retrofitting filters to a existing system

1. Uncover the septic tank and remove the outlet access cover.

2. Pump the tank completely or to at least below the level of the outlet tee.

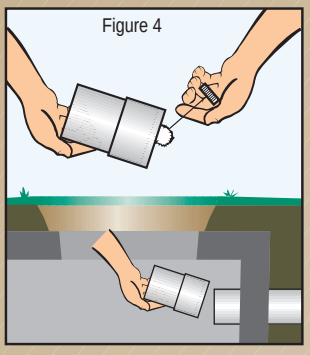
3. To install the A1801, slide the filter into the outlet tee until the top edge of the filter is flush with the inside lip of the tee- sch 40 or 35 PVC pipe must be used **(figure1)**.

4. When installing the A1801, inspect the tee to see that the pipe extends below the bottom of the filter. With the A1801HIP model, the bottom deflector must extend below the bottom of the pipe **(figure2)**.



5. When installing either the A100 or A300, the outlet tee should be removed while leaving at least 3 to 4 inches of the pipe extending into the tank on which to glue the filter **(figure3)**. Use a 4" sch 40 or 4"sch 35 reducer if the pipe extending into the tank is sch 35 **(figure4)**.

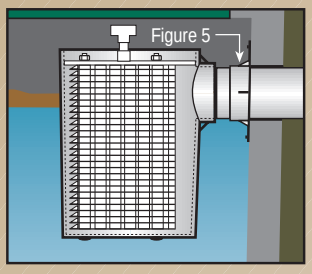
6. If the method described above isn't possible, clean the area around the outlet and attach a standard closet flange onto the tank wall over the outlet. Install the filter with a section of sch 40 4" pipe **(figure5)**. The Supplementary Support Method should be used **(figure6)**.



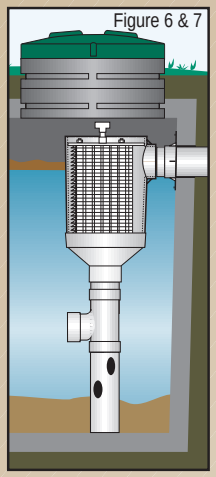
7. Use the Supplementary Support Method when extending the filter inward18" or more from the end of the tank or in high strength waste applications. These high strength waste applications such as restaurants or dog kennels may require additional support to handle the extra weight.

8. The Supplementary Support Method involves gluing a 4" extension adapter to the bottom of the filter case. Next, for support, glue a section of 4" Sch 40 PVC pipe with an inverted Sanitary Tee and then another section of pipe in the bottom of the adapter. Place the filter, adapter, and the support pipe on the outlet pipe. Adjust the support pipe so it rests level on the bottom of the tank. Remove and cut at least four 2" holes from top to bottom in the support pipe **(figure7)**.

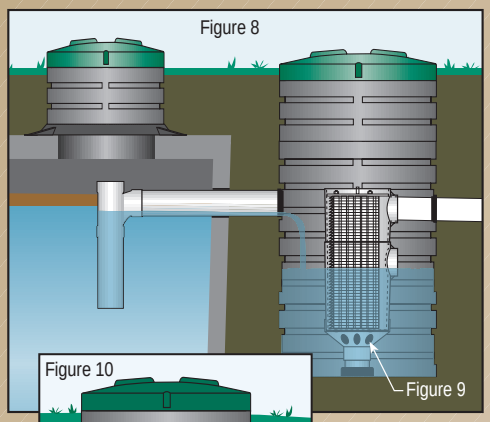
9. Installation of all Zabel Filters outside of the septic tank is accomplished by using a ZEUS™ Basin Assembly, model RB-BAS-20x38, RB-BAS 22x38, or RB-BAS-26x38 **(figure 8)**. This is added between the septic tank and the disposal field by cutting the drain line. When installing an A100HIP or A300HIP, install a Zabel 4" extension adapter and a section of 4" Sch 40 pipe that extends to the bottom of the basin. Drill several 1" holes around the bottom of the extension adapter to allow solids to slough back into the basin **(figure 9)**.

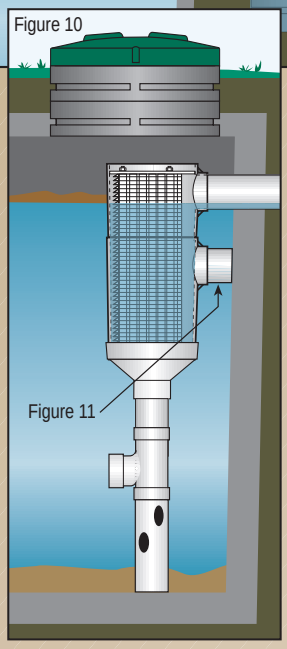


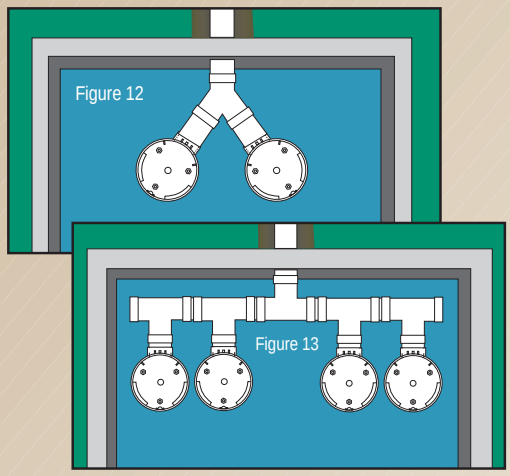
10. When installing an A100HIP or A300HIP unit in a tank, use the Supplementary Support Method **(figure 10)** along with a section of 4" Sch 40 PVC pipe extending from the lower filter case outlet blank to the wall. This will provide additional support for the larger model filters **(figure 11)**.



11. Multiple filter installation may be required for systems having high daily flows. This is accomplished by using a "Y" fitting for two filters **(figure 12)** or by constructing a manifold using a combination of fittings for multiple filters **(figure 13)**. A larger access may be required for servicing this configuration.







Do you have a question about an installation?

Call the Zabel Team at: 1-800-221-5742.

Harry Nurse of Zabel instructing on the importance of using a high quality filter in any system.

Installing Drip Line with a cut-in blade, very little soil disturbance.

Alton Williams of Davis Concrete Products Inc. out of Phenix City, Alabama, giving instruction on how to properly install tanks. The concrete tank was donated by The Shaddix Company out of Cullman, Alabama.

Miss Sherry Bradley, Bureau Training Director, Alabama Dept. of Health.

Sherry you look frustrated...?

Christy White, Soil Scientist for the Alabama Dept. of Health.

On Christy's headstone, we are gonna chisel, 'First one in and last one out of the hole . . .p.s. he probably dug this one himself.

Dale Mask of Dale's Backhoe and Septic Tank out of Eclectic, Alabama, lending his Backhoe skills

Helping Hand

Zabel's® Helping Hands program, the brainchild of Bill Rawlins, Jr., Southeastern Environmental Specialist, continues to provide assistance for homeowners who cannot afford to repair their failing septic system. Bill says, "The Helping Hands program is designed to provide Zabel products and services to those who can least afford and most often need them."

Mrs. Willie Mae Crowder

Helping Hands Unite in Alabama

By Bill Rawlins

What happens when a terrific group of people works together? You get a great big serving of southern hospitality. Auburn, Alabama was the site of our latest "Helping Hands" project.

The Auburn On-site Sewage Treatment and Disposal Conference, held each year on the campus of Auburn University, has proven to be a leader in the onsite industry. Members of the regulatory and private sectors come together to learn about the prevention of, and solution to, health and environmental problems.

This year, the conference went one step further and gathered caring people to reach out to Mrs. Willie Mae Crowder of Loachapoka, Alabama. Manufacturers, contractors, precasters, and public health officials worked under the direction of Zabel Environmental Technology to bring Mrs. Crowder's failing system up to standards.

The newly approved Zabel AeroCell™ with a Geoflow drip disposal system was installed at no charge. Lynn Scott and Bill Niemeyer, along with Christy White and many others from the Alabama State Health Department, provided the preliminary evaluations and permits. Sam Baker from AK Industries and Tommy and Mitchelene Shaddix from the Shaddix Company provided the tanks. The backhoe was made available at no charge from Rental Services Corporation.

Tim Simpson, Simpson Environmental Service, Inc., Dale Mask and Alton Williams from Davis Concrete and Calvin Lockhart from Geoflow are just a few of the many who volunteered their time and 'hands' to complete the venture.

We would also like to recognize Ten Estes from the University, who met the electrical needs of the project, and Elaine Ridgeway, also from Auburn, who provided support for this endeavor. It could not have been completed without them.

A special thanks goes out to all these individuals and companies who once again proved what can be accomplished when this industry unites with helping hands to protect our environment and public health.

WHO SAYS REDNECKS AREN'T REAL BRIGHT??

Hello, is this the FBI?"

"Yes. What do you want?"

"I'm calling to report about my neighbor Billy Bob Smith! He is hiding marijuana inside his firewood."

"Thank you very much for the call, sir."

The next day, the FBI agents descend on Billy Bob's house. They search the shed where the firewood is kept. Using axes, they bust open every piece of wood, but find no marijuana. They swore at Billy Bob and left... The phone rings at Billy Bob's house.

"Hey, Billy Bob! Did the FBI come?"

"Yeah!"

"Did they chop your firewood?"

"Yep."

"Happy Birthday, Buddy"

TechTalk

1. Occasionally, I need to lift raw sewage from a basement to the septic tank. Is it possible to use a submersible sewage pump or do I have to use a grinder pump?

Submersible sewage pumps are often used for this application. Make sure the pump will handle 2" solids. We often supply packages for this application, which includes the pump, float switch, pump basin, check valve, and junction/splice box.

2. Recently, I was designing a drip system and needed to convert PSI to feet of pressure head. What is the conversion?

Simply multiply the pressure in PSI by 2.31. For example, 20 PSI x 2.31 = 46.20 feet of pressure head.

3. Zabel offers several types of electrical panels, however I don't see where elapsed time meters or cycle counters are listed in the specifications. Are these options available?

Yes, we offer numerous options with our electrical control panels. The following is a list of common options:

- Elapsed time meters
- Cycle counters
- 120 or 240 volt selections
- Circuit breakers in a variety of amperages
- Motor contactors
- Lockable latches
- Redundant off with or without alarm activation
- Auxiliary alarm contact
- Lightening arrestors
- Anti-condensation heaters
- Various float switches with optional cord lengths
- Door mounted pump run indicator

ZABEL PROMOTES EDUCATION

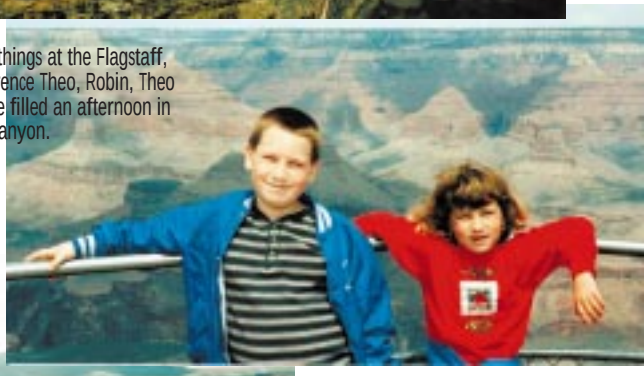
Zabel again helped reward students at Kite Elementary in Jacksonville, Florida, who excelled in the Florida Writes Program. This year, not one but THREE students earned bicycles. Several others were awarded gift certificates. Congratulations, Kids.

Zabel's Travels

Arizona's Wonder GRAND CANYON

"South Rim"

While attending to things at the Flagstaff, Arizona AIM Conference Theo, Robin, Theo IV, and Emma Grace filled an afternoon in awe at the Grand Canyon.



The Grand Canyon has been touted as the Eighth Wonder of the World ever since John Wesley Powell braved the raging whitewater in its depths in 1869. It's inarguably the most overexposed icon of the American landscape - every years, 5 million people come to gawk into the abyss, and you have to wonder if the millions of rolls of film shot here through the generations might come close to filling the canyon from river to rim.

Wupatki, Pueblo

Within the onsite field, a movement for better management of onsite and decentralized systems has been steadily building. In response to this movement, USEPA has developed draft Guidelines for Management of Onsite/Wastewater Systems (Guidelines). These voluntary guidelines are designed to assist interested stakeholders, such as state, local or tribal governments, to improve management programs of onsite systems. The voluntary guidelines consist of a series of five model management programs, with the level of management progressively increasing from one program to the next. The appropriate management program will depend on the environmental sensitivity of the site and the technological complexity of the system. The model programs are a framework intended to assist communities in developing their own management programs and regulations. The five model programs are:

1. System inventory and awareness of maintenance needs
2. Management through maintenance contracts
3. Management through operating permits
4. Utility operation and maintenance
5. Utility ownership and management

The National Environmental Health Association (NEHA) has entered in to a cooperative agreement with USEPA regarding the Guidelines. NEHA will be conducting an Outreach and Public Participation program that will increase awareness of and support for the new voluntary guidelines. As part of the project, NEHA has established an advisory panel of environmental health professionals who are actively involved in managing and regulating local on-site and decentralized systems. Doug Ebelherr, NEHA's Second Vice President, chairs the panel. Members of the panel are drawn from NEHA's Onsite Wastewater Systems technical section, which will constitute a key resource for the project.

The advisory panel is developing an implementation strategy for an outreach and education program targeted to local on-site system operators and the communities served by those systems. Specifically, NEHA is undertaking a grassroots effort with the goals of:

- explaining the Guidelines for Management of Onsite/Wastewater Systems;
- stressing the need for stakeholders to establish and implement management and operational standards;
- building local awareness and support for the voluntary guidelines;
- explaining the technological basis for the comprehensive national program reflected in the management guidelines;
- encouraging institutions to adopt the Guidelines and identifying systems interested in adoption;
- in cooperation with USEPA, providing technical assistance that will facilitate the adoption of the Guidelines; and
- working with state and local regulators, other national organizations, and other public and environmental health officials to build local capacity and support for the Guidelines.

The Onsite Wastewater Systems Section of NEHA's Annual Educational Conference (AEC) in Atlanta, June 30-July 3, 2001, will be structured around the practical application of the Guidelines. Attendees will receive a copy of the document, will review USEPA's history in onsite wastewater management, and will hear detailed presentations about the practical application of selected "program elements" and "activities", as described in the Guidelines.

The information presented at the AEC will be made available to other institutions interested in adopting the guidelines. Additionally, NEHA will continue to use its web resources, its Journal of Environmental Health, and its network of environmental health professionals to distribute information about, encourage the adoption of, and identify communities interested in the voluntary guidelines.

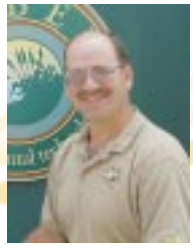
Anyone who is interested in participating in NEHA's efforts regarding the Guidelines, registering for the AEC, or who has comments or suggestions, should contact Tim Towey, Project Coordinator, at (303) 756-9090, extension 315, or send e-mail to ttowey@neha.org.

For more information about the guidelines themselves, visit the EPA Onsite/Decentralized Wastewater Systems web site at www.epa.gov/owm/decent/index.htm.

Faces Behind the Phones

Harry Nurse
President

Jan Nurse
Zabel Zone Editor



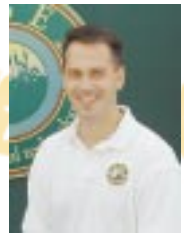
Theo Terry, R.S.
VP Government Relations

Becky Page
VP Business Services

Amy Sparks
Accounts Receivable

Tom Petty
P.G., R.E.H.S.
Environmental Specialist

Bill Rawlins
Environmental Specialist

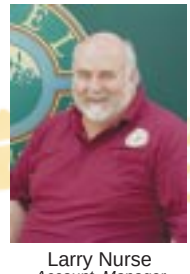


Brian Borders, R.S.
VP Marketing

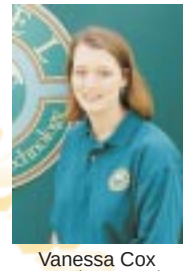
Lesley Jenkins
Credit & Collections

Joe Mattingly
Account Manager

Ann Hines
Account Manager



Larry Nurse
Account Manager

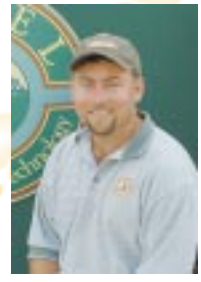


Vanessa Cox
Travel Resource/ International Account Manager

Linda Ellsworth
Production Assistant

Gary Ellsworth
Roto-Mold Production Manager

William Schneider
V.P. Operations



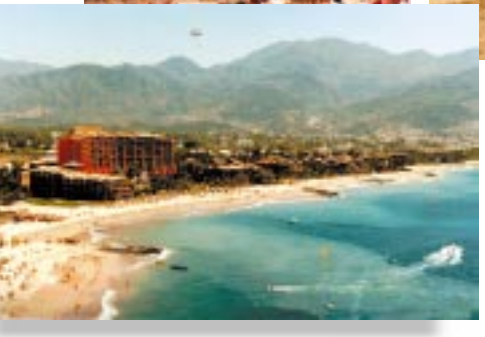
Tom Jenkins
Media Services Manager

Zabel Outdoors

For those of you who know about bird dogs you may be interested in this. Tom Jenkins has talked his wife, Lesley, into allowing him to fill the time slot between hunting in the fall and fishing in the spring with another hobby. This 8-month-old English Pointer is out of Honky Tonk Attitude and Damascus Elhew Twist. If her breeding does her justice and Tom does his part training,he plans to start running field trials this fall.

Taking Harry's son, Morgan, on his first hunting trip was a great experience for him and the adults. Congratulations, Bill, on your 2000 Kentucky harvest.

This summer take a youngster along with you to enjoy our great outdoors, you won't be sorry.



Zabel's Bill Schneider is excellent at one of his favorite hobbies, photography. Here is some of his work. Left while enjoying para-sailing with his wife in Mexico, he had time to get some great shots. Right: while attending a heavy equipment trade show he captured some of the local Kentucky flavor. After I wiped the water from my eyes he informed me these two gentlemen had more money than I will achieve in my lifetime.

Technology.

At Infiltrator Systems, we design and engineer onsite septic system products to complement nature's own processes for recycling wastewater. Our chamber technology is based on fundamental principles of physics, soil science and topography and is scientifically engineered for the job. Manufactured from recycled resins, our chamber products feature advanced technology like SideWinder® sidewalls that maximize the available surface area for infiltration, and MicroLeaching® louvers that limit the intrusion of soil and fines, while optimizing effluent disposal and promoting evapotranspiration.

Performance.

Our chambers provide the maximum infiltrative surface area per linear foot. Compared with stone and pipe systems, Infiltrator chambers offer comparable wastewater treatment with up to a 50% smaller footprint. There are more than 600,000 Infiltrator systems installed in the United States and 13 other countries.

To receive the latest third-party research documentation on leaching chamber performance, please contact the Infiltrator Systems Inc. Technical Service Department at 1-888-231-9567.

Commitment.

We understand that everyone has a role and responsibility in conserving our natural resources. That's why we invest millions in research and development to create new products that operate more efficiently and conserve water resources. We also sponsor installer education seminars and onsite events and publish materials for homeowners so they can maintain their septic systems and learn how to keep our water resources safe for the future.

INFILTRATOR SYSTEMS INC

Environmental Onsite Wastewater Solutions™

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PRODUCT UPDATES

By Bill Schneider

My short tenure with Zabel has been an education on customers, products, and application of those products. It has been interesting to learn how we have gone from a small company specializing in filters to a company whose growth has been driven by need for innovation in the onsite industry.

A large part of our product lines are a direct result of listening to you, our loyal customers, who have needed better, more advanced products to help on your jobsites. We welcome your input and hope you will continue.

For example, this spring ZABEL® introduced an additional four filtered pump vaults for larger commercial applications. These vaults are available in 50", 56", 62," and 68" lengths. All are built with filter plates designed to protect pumps and disposal fields from solids larger than 1/16th inch.

Another innovation, which responds to your requests, is the Zabel Poly Tank Adapter. Zabel risers and lids have become so popular that we were asked to develop a product that would allow you to adapt our risers and lids directly to the AK and Norwesco Poly Tanks. This 26" x 2" adapter is constructed of the same high quality polyethylene as our other parts and will interlock to the tank with a patented "twist and lock" design. It is tested to withstand a 3,300-lb wheel load.

At the beginning of March, the decision was made to change the color of the Zeus basins and risers from black to gray. To be consistent, you will also notice Zabel filters arriving in the new gray color. The only exception will be our lids, which will remain green. Also we have redesigned the A100/300-12 series of filters to eliminate the need for stainless steel rods and nuts. A new central support system provides greater stability and increases the overall strength of these filters.

Over the last two months, your Zabel team has been beefing up our inventory of products you order on a regular basis. Our mission is to maintain or exceed our own standard of shipping your order within 24 hours. Please let your Zabel Account Manager know if you have any specific routing instructions or delivery requirements.

Spring is upon us and brings with it new opportunities. We are grateful for your business and want to continue to assist in developing new business for your company. How can we help?

"By permission of Johnny Hart and Creators Syndicate, Inc."

Zabel® Comes to You!

The development of new on-site technologies has resulted in many organizations scrambling to educate and train their members and employees. Zabel's Environmental Specialists spend the majority of their time working with groups of professionals in their educational efforts. At Zabel, we pledge our support to the education of the on-site professional. Whether your organization is that of installers, manufacturers, regulators or design engineers, Zabel wants to assist you in your training efforts.

Simply complete the blanks / boxes below, and return the form. Your Environmental Specialists will contact you to arrange a time, place and date. Zabel can participate in your agenda of on-site training, or we can conduct a complete training session over the various technologies new to the industry. We look forward to sharing in the success of your organization.

Organization Name _____

Address _____

City _____ State _____ Zip Code _____

Phone _____ Fax _____ Email _____

Complete Training Class _____ One of Participants at Training Class _____

Expected Number of Attendees _____

Topic(s): Check all areas of interest

☐ Effluent Filters ☐ Effluent / Sewage Pumps and Sizing ☐ Discharge Systems ☐ Alarms & Controls

☐ Access Systems ☐ Grease Traps ☐ Peat Systems ☐ Basin Systems & Aerocell ☐ Codes / Standards

☐ Aerobic Systems ☐ STEP Systems ☐ Other _____

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Environmental Specialist
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Tom Petty, R.E.H.S., P.G.
Environmental Specialist
Email: Tpetty@zabelzone.com
Ph: 1-800-221-5742

MAIL TO: Zabel Environmental Technology / Training
P.O. Box 1520 Crestwood, KY 40014
www.**zabelzone**.com

Zabel® Supports Training

Every successful industry requires professionals who are well trained, with the on-site industry being no exception. As new research and technology become available, there is an increasing need for educational opportunities for contractors and regulators.

Zabel Environmental Technology® has been a leader in supporting these educational programs.

We begin this process by making sure we have the most qualified, knowledgeable personnel in the business. Our training personnel have a wide variety of knowledge and experience through years of regulatory and hands-on experience in onsite wastewater.

Our training personnel go to the various states to conduct classroom and hands on seminars. In states where there is a continuing education requirement, we assist regulators in instructing contractors in their state or county. Zabel knows the value of keeping people informed and updated and can help regulators to stretch a tight budget by providing our services for these programs free of charge.

We also conduct Zabel Certified Installer Programs in many states. These classes are to teach the contractors and regulators specifically about Zabel products, including appropriate uses, proper installation, etc. They also learn how to utilize them to better serve their customers by creating the best onsite system possible. We teach the participants proven methods and ideas to improve their bottom line- a win/win situation for all concerned.

Would you like for Zabel to help with your state or county training? Or would you like to attend a Zabel Certified Installer course? Please contact us at 1-800-221-5742 or simply fill out the form on the preceeding page and mail to us.

By Bill Rawlins

TRAINING

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2001

June

10th - 14th, Canadian Institute of Public Health Inspectors 67th Annual Educational Conference and Exposition, Robert W Bradbury, Executive Director (250) 388-9378
12th-14th, ENTECH 2001 Conference, Atlantic City, NJ., 630-469-4611
30th - Jul. 3rd, NEHA 2001, Atlanta, GA., NEHA 303-756-9090

July

11th - 13th, Georgia Env. Health Ass. Conference, Melba Bridges 706-468-6850
14th, TOWA Summer School, Houston, TX., 512-494-1125
19th - 21th, FL Onsite W.W. Assoc. Tradeshow,Daytona Beach, FL., Kevin Sherman 850-402-9230
24th - 27th, Florida Env. Health Ass. Trade Show, Seldon Carsey 813-962-0176
25th - 26th, Tennessee Educational Conference, Nashville, Bill Neal 901-286-8348
28th, TOWA Summer School, Tyler, TX., 512-494

August

4th, TOWA Summer School, San Antonio, TX., 512-494-1125
5th-20th, NC State University, Cont. Education Courses Fall Series, Joni Tanner, 919-513-1678
13th-15th, Trenchless Technologies Rehab Road Show, Boston, MA., Melissa Heinl, 330-467-7588
25th, TOWA Summer School, Ft. Worth, TX., 512-494-1125

September

17th - 18th, NW Onsite W.W. Treatment Exhibit, Robert Seabloom 206-543-5539
18th - 21st, West Virginia Public Health Ass. Conference, V.J. Davis 304-367-2787

October

3rd - 4th, Ohio Env. Health Association Conference, Ken Sharkey 513-564-1761
13th-17th, WEFTEC Annual Conference, Atlanta, GA., 800-666-0206
21st-25th, APHA annual meeting & Expo, Atlanta, GA., Lynn Schoen, 202-777-2479
29th - 31st, New Mexico Environmental Health Association Conference, Albuquerque, NM., Tom Duker, 505-924-3667

November

12th, Trenchless Technologies Rehab Road Show, Riverside, CA., Melissa Heinl, 330-467-7588

2002

January

30th- February 2nd, NPCA MCX Show, Indianapolis, IN., Brenda Malayeri, 317-571-9500

At the time of printing those shows highlighted in red will have someone from Zabel speaking or exhibiting at the conference.

For the most up to date listing, or to submit a Conference or Trade Show see the Trade Shows page under the Coffee Shop section on our website.

- ✔Reservations
- ✔Scheduling
- ✔Planning
- ✔Organizing
- ✔Travel
- ✔Registration

If you are having a Conference or Expo, and would like the information printed in the next Zabel Zone® or to appear on the Internet, please send your info to us. Or go online to www.***zabelzone***.com, click the Coffee Shop, then click Trade Shows, then click the Post button and start typing.

Name of Conference _____

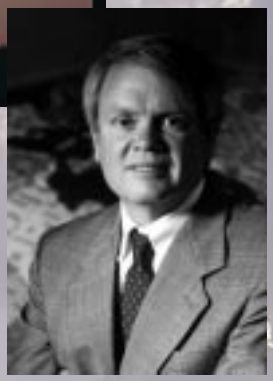
Date(s) of Conference _____

Contact Person _____

Telephone number _____

Send this form to: Zabel® Environmental Technology, c/o Tom Jenkins/Conferences, P.O. Box 1520, Crestwood KY 40014

IT'S A BEAUTIFUL THING!



By Richard J. Otis, P.E.
Ayres Associates

The septic tank is a beautiful thing! It is simple in design but complex in its functions. We generally assume that its primary purpose is to remove settleable and floating solids from wastewater to protect the infiltration system from clogging due to settleable solids, greases, and oils. But it does much more than this! It also stores the wastewater solids it removes from the wastewater stream and "digests" the stored solids to stabilize them (reduce them to non-degradable compounds) and reduce their volume. The digestion process is very important to the septic tank's role in protecting the soil from clogging and something that should be better understood.

"Septic" means to make putrid. We have all smelled a septic tank. The odor is far more objectionable than that from a municipal wastewater treatment plant. This is because there is no oxygen in the septic tank. As a result, only facultative and anaerobic microorganisms can thrive in this anoxic or anaerobic environment. Without free oxygen available, these microorganisms that feed on the accumulating organic solids have difficulty completely oxidizing the organics into carbon dioxide (an odorless gas) and water. Some organic removal is accomplished if combined oxygen is present in the form of such compounds as nitrate (NO_3) or sulfate (SO_4). These compounds can be reduced by facultative organisms to nitrogen gas (N_2) and hydrogen sulfide (H_2S) to free the oxygen for oxidation of organics. After the combined oxygen is depleted, some of the microorganisms, called acid formers, split or hydrolyze the proteins into incompletely oxidized products called volatile fatty acids. This is the first step in the digestion process. The volatile acids are released in the water phase and some escape into the air creating very foul odors. Where strict anaerobic conditions exist in the tank, methane generating bacteria can convert these fatty acids into methane (CH_4), an odorless gas. The production of methane is the final step of the digestion process.

Complete digestion usually does not occur in septic tanks because conditions inside the tanks are not optimum for the methane producers. First, methane producers are strict anaerobes. They cannot tolerate any oxygen, even if it is in the combined form of nitrate (NO_3),

sulfate (SO_4) or other oxygen containing compounds. Second, they like warm temperatures in the range of ninety degrees. Most septic tank temperatures are below sixty degrees. Finally, they cannot withstand low pH's. If the pH is close to 6, which can happen if the fatty acids are not removed, methane production stops.

Why is it important we know this? First, it is the gases that are released during digestion that are what make it very dangerous to enter a septic tank. Hydrogen sulfide is extremely toxic. It paralyzes the diaphragm and breathing stops. Humans are quickly overcome and die. Carbon dioxide and methane are also dangerous because they can displace oxygen and are odorless. A worker can be unaware that there is no oxygen until he faints. If not quickly removed, he would die of asphyxiation.

Second, the first step in the digestion process breaks down the solids in the sludge into simpler compounds. Many of these simpler compounds are released into the septic tank effluent as dissolved compounds. In other words, many of the settleable organic solids are converted to soluble fatty acids and leave the tank in its effluent. While this increases the organic loading on the infiltrative surface over what would be released if merely sedimentation occurred in the tank, the fatty acids are more easily oxidized to carbon dioxide and water under aerobic conditions by the soil microorganisms.

Third, the second step in digestion, methane production, removes organic carbon from the septic tank effluent. This has the effect of reducing the organic loading on the infiltrative surface. Unfortunately, because of lower than optimum temperatures for methane producers in septic tanks, the rate of methane production is low. Therefore, many organics that had been held by the settled solids are released to continue their travel out the septic tank.

Why worry about the organics in the septic tank effluent? Isn't it the suspended solids that clog the soil? Not really. Suspended solids can help speed the clogging process along, but it is the organic carbon released by the septic tank in both dissolved and particulate form that has the greatest impact on soil clogging. The soil microorganisms thrive on the waste organics and create more microorganisms as they feed. It is the increase in microorganisms and their metabolic byproducts that fill the soil pores and cause clogging. Unfortunately, nearly all septic systems are sized according to the estimated hydraulic loading, but we really should be sizing based on the organic loading. Therefore, the function of the septic tank is not only suspended solids removal but also "conditioning" of the wastewater to make the waste organics more available to the soil microorganisms. The beauty of it is that it does this without mechanical equipment or much attention from the homeowner!

So what role do effluent filters play in this? Effluent filters remove suspended solids that might otherwise leave the tank. By retaining more solids in the tank, potential clogging is reduced and the digestion process has an opportunity to partially digest these retained solids into forms more readily available as a food source to the soil microorganisms. Thus, treatment performance of septic tank systems is enhanced.

By better understanding what a septic tank can do, we can better design our systems. With proper sludge management and prevention of solids scour from the tank by use of effluent filters, the septic tank is an extremely effective wastewater treatment device.

It truly is a beautiful thing!

"Begin a Career with Zabel"

Zabel Environmental Technology is currently looking for highly trained and experienced onsite professionals to fill the following positions:

- Technical Sales Representative
- Environmental Specialist

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