March 2022

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PICNICS AT THE LAKES

Chris Ohm is building the company his father founded into a one-stop shop for onsite treatment services in the scenic lake country of Northwest Minnesota p. 10

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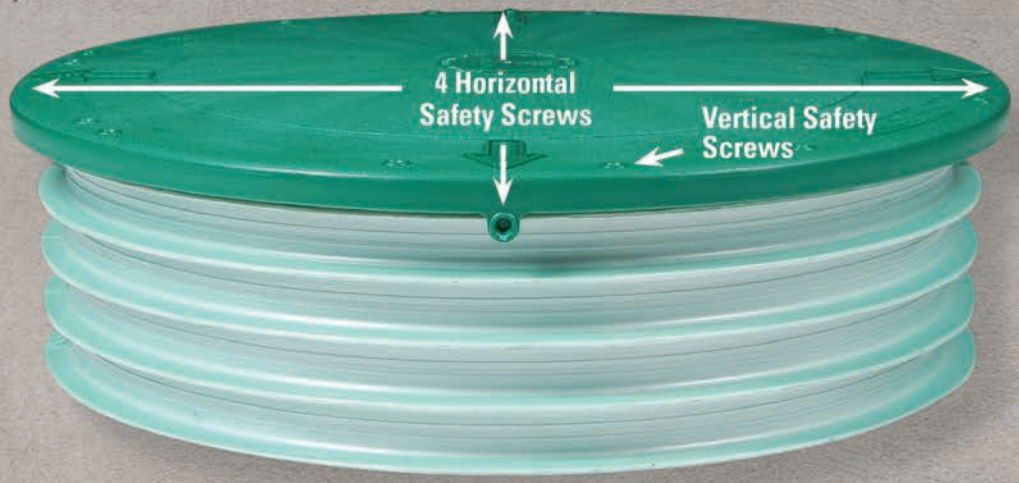

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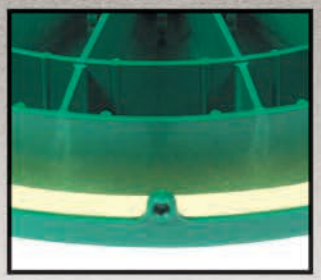

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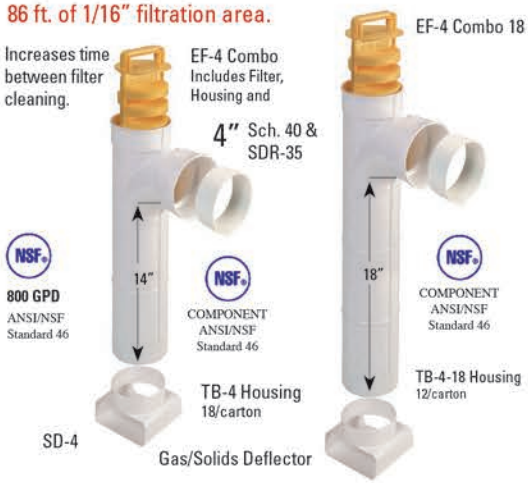

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Ohm Excavating has been serving customers in the lakes region of Northwest Minnesota since 1971. Olivia and Chris Ohm are shown on a job site with a New Holland B110B tractor loader backhoe. (Photo by Keri Heibel)

Coming Next Month

ISSUE FOCUS: Large-Scale and Commercial Treatment Systems
Basic Training: It's a Carolina barrier island solution
Contractor Profile: Visit a British Columbia septic expert

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ADVERTISER INDEX

March 2022

Enjoy this issue!

Established in 2004, *Onsite Installer*™ fosters higher professionalism and profitability for those who design and install septic systems and other onsite wastewater treatment systems.

Jim Kneiszel

Send your comments, questions or opinions to Jim Kneiszel at editor@onsiteinstaller.com

Let's Amass the Biggest Library of Installer Videos

Sharing your knowledge of septic systems is as easy as point, shoot and talk. We're here to post your video content for the installer community

A picture is worth a thousand words. Well, often that axiom is correct. And sometimes a video is worth a thousand pictures. A great example of this is the constant torrent of YouTube videos posted by DIY enthusiasts covering every imaginable topic.

I have learned to rely on these videos to take on numerous tasks around the house and garage that I wouldn't necessarily have figured I could tackle in the past. Fix a leaky faucet? Check. Building a bookcase? Check. Change belts on the snowblower? Check.

One recent job comes to mind. It saved me hundreds of dollars in exchange for a few hours of my time … and fueled my confidence to take on more and more repairs for myself.

I drove my 19-year-old car around for two winters without heat because the mechanic told me it would cost almost as much as the car was worth to fix the climate controls. Then I asked the question on YouTube. Guess what? Many other owners of the same car had encountered this problem and they were generous enough to share their step-by-step instructions to fix it.

Buoyed by these video clips, it wasn't long before I had torn out much of the dashboard of my car to remove the control panel and discover the broken solder joint that plagued this particular vehicle. After a little work with a soldering iron and reassembling all the plastic bits — I was back to being toasty warm behind the wheel. The whole operation took less than two hours.

Why do I bring up my small automotive repair triumph? It's not to brag, really, though I was pleased to have heat in the car again. Rather, the story illustrates the power the millions of first-person instructional videos have to help others learn a new skill, save a little money and generally make lives easier.

We would like to do that with *Onsite Installer*, too.

ENHANCE YOUR EXPERIENCE

I think we do a good job in this print publication to help technicians learn about new onsite technologies and how to implement them. Our System Profile story each month takes you to the site of a challenging project and gives you the details of the job through interviews with installers and designers. We also share numerous photos to show the machines at work, the equipment that's buried and the site issues to overcome.

> It's pretty basic: Find your camera app, scroll to "video," point the camera at what you want to shoot and press the go button. **Show what you feel is important to the viewer and start talking.**

But what if we could enhance your experience from these stories by adding voice and video? The good news is we can … and we can make it better with your help. Through the magazine's online home, www.onsiteinstaller.com, we are able to post videos to build on the reader experience you find here. These could be video versions of the System Profile feature. They could be demonstrations of machines and onsite technology used in the field. The ways we could use videos are almost limitless.

I want to invite you to become a partner in this process. All it takes is your knowledge and experiences, a smartphone and a passion for helping others learn something new to advance this great industry. You don't have to be a professional cameraman or communicator. You really don't need to know much about the video-making process. You just need to know the subject material — and let's face it, when it comes to installing septic systems or operating machinery, readers of *Onsite Installer* are the experts.

EASY TO GET STARTED

Before we get into the content of helpful videos for the onsite industry, just a word about making videos. It's pretty basic: Find your camera app, scroll to "video," point the camera at what you want to shoot and press the go button. Show what you feel is important to the viewer and start talking. Then all we need is the raw video uploaded to our team at COLE Publishing and they will do the rest to post your video and get folks watching it.

Think this is something you can do? Would you like to network with other installers and encourage them to post videos as well? Then drop me a line at editor@onsiteinstaller.com and I'll help you get started.

So what are some of the types of videos you could create? Here are a few ideas:

Document a system installation

I'm sure you already document system installations with photos using your phones, along with the as-built drawings and any notes you feel are important for future maintenance providers and the homeowner. A video covering each step of the process will enhance your documentation for the customer. And it can be helpful for others in the industry who encounter similar system design or site challenges. Simply shoot a few minutes of video as your team completes excavation and site prep, tank and component installation and laying the drainfield. While showing the process, explain each step along the way.

Demonstrate O&M procedures for advanced systems

We know that annual or twice-a-year inspections and maintenance are becoming necessary for more systems. Grab your camera and walk through your operations and maintenance process for these systems. Sharing a video like this is a good conversation starter for professional networking. Others may benefit from your ideas, while you might get valuable feedback that will help improve the quality of your inspections moving forward. A video is also a great way to explain the complexities of a variety of onsite solutions to your customers. Seeing you in action may prompt more system owners to contract with you to take care of their systems.

Contribute machine operator techniques

Through the popular Roe-D-Hoe competitions at past Water and Wastewater Equipment, Treatment and Transport (WWETT) Shows, I have seen firsthand how installers can help each other improve their techniques behind the controls of excavators and skid-steers. These skills challenges prompt a lot of valuable discussion among operators — sharing tips and tricks about more efficient ways to get jobs done. When you encounter a challenging earthmoving situation, flip on the camera and show how you dealt with working in tight spaces, on steep grades and so forth. Sharing these videos will help all operators build on their skills.

Show us your favorite machine

Create a walk-around video reviewing your favorite excavator, backhoe or other piece of equipment. Show installers the features and capabilities you like best about the machine. Talk about the pros and cons of each piece of equipment used regularly by your crew. Your input could help point others toward more efficient equipment and their videos could do the same for you. Often the best advice comes from an operator who works in the field and has their hands on the controls every day.

Emphasize safety on the job

Installing is hard, often dangerous work. We benefit as an industry when we can share information that allows crews to work more safely around excavations and with heavy equipment. Shoot a video demonstrating how you slope spoils piles to prevent earthen collapses. Show how you employ a trench box when working in a deep excavation or in unstable soils. Walk through the personal protective equipment your crew uses, including clothing, footwear, eye protection, hard hats, etc., in the hopes that it helps others work more safely.

CONCLUSION

You're probably not a professional videographer and nobody expects you to be. But you do know more about installing septic systems than anyone else. That's why it's important for us to share your uniquely qualified perspective on the installing industry in any way we can. We'd like to stop by and capture videos of every Onsite Installer reader and visit every worksite to show you at work. But that's not realistic, of course. What we can do is build a library of helpful videos you create and make them available for anyone to view and learn from.

Drop Us a Line

Have a comment about an article you've seen in *Onsite Installer*? An experience from a job that you'd like to share? *Onsite Installer* would love to hear from you. Email comments and photos to editor@onsiteinstaller.com

@onsiteinstaller.com

Visit the site daily for new, exclusive content. Read our blogs, find resources and get the most out of *Onsite Installer* magazine.

DO NOT DISTURB

Minimize Ground Pressure

It's important to understand the limitations of different excavating equipment and recognize when renting or leasing equipment will facilitate effective and efficient system installation. Whenever possible you want to avoid compaction of the soil treatment area and choosing the correct equipment is a great step to meeting this goal. This online article outlines key issues to consider regarding your equipment selection. onsiteinstaller.com/featured

GET NOTICED

Stand Out From the Crowd

You're always competing for the eyes of your potential customers. It's hard to get noticed and stand out. But you also don't have time to try every new platform or marketing strategy out there. Here are some tips to avoid drowning in a 'sea of sameness' and get noticed by the potential customers you want to attract. onsiteinstaller.com/featured

Overheard Online

"If we're going to be successful, safety training cannot be about compliance. We have to let human beings know we care about them and want them to stay alive."

– 5 Ways to Shake Up Your Safety Training
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WHERE YOU BELONG

Benefits of Onsite Associations

Membership in onsite organizations keeps you connected to a community of professionals and serves as a forum for the exchange of ideas and information among private industry professionals, government policymakers and regulators. Members of various state and province associations share why they joined and how they benefit from membership. onsiteinstaller.com/featured

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Precast Tanks Maximize Treatment Capacity in Small Footprint

Photo courtesy of Monarch Products Co.

Challenge: A supermarket sought to install a new septic system with an 8,000-gallon capacity in a footprint that was limited by mature trees and an existing parking lot.

Solution: The use of precast concrete tanks maximized the site's treatment capacity in the small space. Engineers selected four 2,000-gallon septic tanks and two 2,000-gallon pump tanks. The design of the precast concrete tanks also allowed the inlets and outlets to be positioned at optimal locations so only a single pump was needed in the last tank (top left).

Quality-Engineered: Precast tanks are designed and engineered to the latest industry standards, use quality raw materials and are manufactured in accordance with strict QA/QC programs, providing strong and durable solutions that stand the test of time.

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Resilient: Precast concrete's exceptional strength and durability enhance the longevity of each treatment system and help protect this valuable infrastructure from the effects of both natural and man-made disasters.

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Learn more at **precast.org/onsite**

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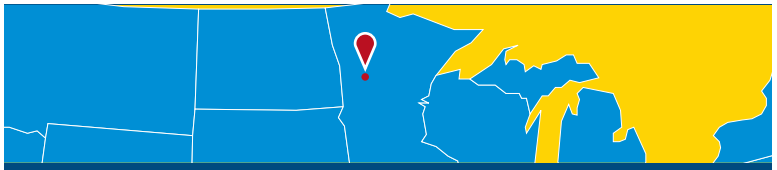
National Precast Concrete Association

INSTALLER PROFILE

PICNICS AT THE LAKES

Chris Ohm is building the company his father founded into a one-stop shop for onsite treatment services in the scenic lake country of Northwest Minnesota

By Ted J. Rulseh



Ohm Excavating
Audubon, Minnesota

Owner: Chris Ohm
Founded: 1971
Employees: 6
Service area: 50-mile radius
Services: System installation, inspection, general excavation, residential landscaping
Associations: Minnesota Onsite Wastewater Association
Website: www.ohmexcavating.com

It took some arm-twisting for Grant Ohm to get his son to give up a career in corporate finance and take over his onsite wastewater treatment business.

But since 2018 when he assumed ownership of Ohm Excavating in Audubon, Minnesota, Chris Ohm has expanded and diversified it. The latest addition to the company's offerings is septic and holding tank pumping, launched last summer.

The company focuses on the Detroit Lakes area, which boasts some 400 lakes within 25 miles. That means often dealing with challenging soils and constricted lakefront properties where fitting a conventional septic system can be difficult to impossible.

Whatever the conditions, customers can count on Ohm Excavating to devise an end-to-end solution. Says Ohm, "We'll look at your system. We'll inspect it. We'll design one, install it, and landscape it at the end if you want us to. If it's a holding tank system or a regular septic system, we'll pump it out."

Doing business in the scenic Detroit Lakes area has its perks: "Almost every day we have a picnic by the lake, because we're always working on a lake property." A big bonus for Ohm is working alongside his youngest daughter, Olivia, who joined the business three years ago and aspires to own it when her father steps away.

A MAJOR CHANGE

Grant Ohm started the business in 1972 after working for a large construction and excavating company based in Fargo, North Dakota, about 40 miles west of Detroit Lakes. "He saw a need," Chris Ohm recalls. "They were coming out with more and more regulations on septic systems." He started out working mainly on septics but also digging basements and doing general excavation.

Chris worked with him summers during high school and for three summers during college at North Dakota State University. He earned an accounting degree and eventually became a certified public accountant and a certified fraud examiner. Corporate life suited him well for more than 30 years.

Meanwhile, his father built a successful business and a solid reputation within the lakes area. "Then in 2015 and 2016 he started pushing for me to buy the business," Ohm says. "He was getting up there in age, and he wanted to exit. I held back. I wasn't too sure I wanted to do this. In the corporate life you make pretty good money.

<< Chris Ohm guides an Infiltrator Water Technologies IM-1530 tank into place, while Olivia Ohm is behind the controls of the New Holland backhoe. (Photos by Keri Heibel)

>> Olivia Ohm uses a Northwest Instruments NSL 100B transit on a job site.

Olivia Ohm cuts a length of plastic pipe on a job site.

Chris Ohm is behind the controls of a New Holland backhoe during an installation.

"My dad didn't want the name to go to anyone else. **I didn't either, so in 2018 I made the decision to buy the business from him."**
Chris Ohm

"Then in 2017 I really got the hard sell. He was either going to sell the business to me or just sell the assets – the equipment, tools and trucks. He didn't want the name to go to anyone else. I didn't either, so in late 2017 I made the decision to buy the business from him."

TACKLING TOUGH CONDITIONS

Ohm Excavating installs in-ground, at-grade and mound treatment systems along with holding tanks. Soil conditions can pose difficulty. "We kind of have both worlds — heavy clay and sand," says Ohm. South of Detroit Lakes, sand dominates; to the north, clay is more common, and that usually calls for mounds; the company installs 15 to 25 of them per year.

Ohm does soil evaluations using 4-inch augers, one designed for sand and the other for clay. "We try to get down to 84 inches, and then we use the Munsell color charts to see what the soil is doing and make sure it's good for an in-ground system. If we encounter redox or depleted soils before we hit 84 inches, we don't keep going. Or if we hit water or any type of limiting condition, we stop."

Ohm takes pride in giving customers complete information about the site to help them make sound decisions on how to proceed. "We spend a lot of time with customers," he says. "We walk them through and show them exactly what amount of space they have available, to see if we can fit a system in. We do everything we can to get a standard system into their property."

SITE CONSTRICTIONS

That's sometimes not feasible, especially on lake properties. "One problem is just the sizing of the lots," says Ohm. "Many lots are only 40 or 50 feet wide. If somebody on one of those lots has a shallow well (less

than 50 feet), it becomes challenging to figure out what we can put in. We have to be at least 100 feet away from a shallow well. So if they or their neighbor has a shallow well, it puts them out of luck for getting a system other than a holding tank.

"The other thing we run into, on smaller lots and even some bigger lots, is the home sizes. The square footage and footprints of the homes are increasing dramatically. Rather than a lake cabin with two or three bedrooms and 1,200 square feet, we're seeing homes that are 2,500 square feet and have five or six bedrooms. They're taking up more of the available property, and all of a sudden they get forced into a holding tank system."

Permitting for systems is generally straightforward, largely because of the relationships the company has built with county regulators over the years. "They're each a little different in what they want for the permits," says Ohm. "Typically we use the Minnesota Pollution Control Agency design sheets to design our systems. We submit all that to the county, and the permits go through pretty easily."

On jobs, Ohm Excavating usually uses Q4 high-capacity chambers (Infiltrator Water Technologies) for conventional drainfields and washed rock for mounds (with locally sourced washed sand). Septic tanks are precast concrete, or plastic (also Infiltrator) on sandy sites and where ease of handling is an advantage.

> "We make sure we clean up. We don't leave anything behind. We level out the ground so that typically there's minimal work they have to do."
>
> Chris Ohm

For mound systems, Goulds pumps are the favorite. "I remember as a kid my dad and I would stop in Fargo and pick up Goulds pumps," says Ohm. "We have pumps out there that have lasted 30-plus years, and they're still going. There's a reliability factor we've come to trust." For homes with three or more bedrooms, systems include effluent screens (Polylok).

Alarms (SJE Rhombus) are installed on the effluent screen and on mound system lift pump tanks: "We give the customer a choice. We typically use the indoor tank alert that has to be wired into the house, but if they want to upgrade they can go to a Wi-Fi alarm."

KEEPING CUSTOMERS HAPPY

Lake lot owners can be especially protective of their properties, and Ohm Excavating chooses equipment and does work with that in mind.

THE NEXT GENERATION

A few years ago, Olivia Ohm was studying at North Dakota State University, not exactly sure what she wanted for a career.

Then she spent a summer working for her father's business, Ohm Excavating. "I really started to like it," says Olivia, 24, youngest of Chris Ohm's three daughters (he also has two sons). "So I chose to do this full time and started getting my certifications."

She is now certified as an onsite system installer, designer, inspector and maintainer. "She runs the equipment, the backhoe, the skids, she's right there in the trenches," says her father. "She does it all."

Her dad recalls an interesting item he saw on AgWeek TV: "It was about a lady who was going to college and really didn't know what she wanted to do. She ended up taking over her uncle's ranch and just loved it. I sent that to Olivia, and she replied, 'That's me.'"

Olivia earned her certifications through classes offered by the Minnesota Pollution Control Agency and the University of Minnesota. "The courses range from a couple of days to a week long," she says. "Once I finished each course, I would go through a mentorship back home to get more hands-on training and learn the paperwork side of things. After the mentorship, I would have my license."

As a child, her only exposure to the business came on family visits to her grandfather, the late Grant Ohm. "I didn't grow up around this stuff at all," she says. "I was probably as far away from an outdoorsy person as you could possibly get. I worked at our local mall. I was going to school studying to maybe be a teacher.

"But then I came out here, and I love working outside now. I love being on the lakes all the time. The positivity with the customers is great. Everybody is just so happy when at the lakes. The customers are great to work for and work with. Then of course I love working with my dad. We make a great team.

"Earlier this year we had a job where I had dug around a pipe. I had my knees over it, and I was standing on my head to look into a sewer line. I looked at my dad and I said, 'If you had told me a couple of years ago that I would be right here, I would have never believed you."

Last year she began leading an installation crew. In the years to come she plans to earn more certifications (such as intermediate designer, advanced designer and advanced inspector) and continue learning the business. "My plan is to own it, once my dad gets to the point where he doesn't want to do this much work anymore. That's when I'll take on more responsibility."

Chris Ohm notes that his father, who died in May 2020 at age 80, was "tickled pink that this business was going to continue even beyond me. To have Olivia really wanting to be a part of it, he couldn't stop talking about it. He was so excited."

The Ohms use a Nikon AL-15 laser level during a septic system installation.

The primary machines are:

- 2011 New Holland B110B tractor loader backhoe
- 2009 New Holland L170 skid-steer
- 2005 New Holland 185B skid-steer
- Rental mini-excavator

About 65-70% of installations are replacements where systems have failed or the property owner is expanding a home. Customer satisfaction is a key goal. After the initial site visit and discussion of options, team members make return trips as needed to answer questions.

After the installation, "We make sure we clean up," Ohm says. "We don't leave anything behind. We level out the ground so that typically there's minimal work they have to do. There are a few systems we put in late when the ground is starting to freeze. We can't clean that up, but we tell the customer we'll be back in the spring and get it all leveled and looking good."

Ohm Excavating has a three-year-old landscaping division that customers can hire for hydroseeding or sodding; the division also plants trees and shrubs and builds retaining walls and patios.

PUSH INTO PUMPING

Pumping was another logical service extension; Chris and Olivia earned their maintainer certifications earlier last year. The company used to contract with others to pump tanks before inspections or replacements but now handles that work in-house while also pumping holding tanks for customers.

The goal is to become a player in the general tank pumping business. Despite competition from several pumpers in the area, "I feel it's going to take off faster than we expect," Ohm says. The company's first vacuum

"I get to be outside. And I get to work with my daughter. I don't think there's anything better than that..."

Chris Ohm

truck is a 2005 Freightliner with Mercedes-Benz 460 engine, 3,200-gallon steel tank (Centerline), National Vacuum Equipment 866 liquid-cooled pump, heated valves, and two access points for pumping.

"We tossed around going with a smaller truck so we wouldn't need a CDL," says Ohm. "But when we put in holding tanks, typically we install in two 1,500-gallon tanks, so we're looking at 3,000 gallons to pump out. We figured if we're going to do this, let's jump into it." The tank is about five years old, and the pump is three years old.

GOING TO MARKET

Aggressive marketing is a key to building the pumping side, as it has been for the business as a whole. "Before I bought the business it was strictly word of mouth," says Ohm. "We've been in the same location for 40-plus years, and everybody knew my dad.

"I wanted to build it some more — get a little more of the territory and a little more market share. We have a rotating billboard system, where they go up during our season. We didn't have a website before I purchased the business; we now get a number of leads through that. We also do Facebook, which Olivia is in charge of.

"We network with Realtors. If we get a call to do an inspection we'll ask them to be out there with us. We visit with them and just ask them, if they like what we're doing, to keep us in mind. We have one realty company in Detroit Lakes where we advertise in the folders they provide when they meet with a prospective client." The real estate channel started to pick up momentum in 2020, and last year: "We saw it have a huge impact."

All in all, Ohm has no regrets about leaving corporate life. "The reward is dealing with the customers and helping them solve a problem," he says. "I get to be outside. And I get to work with my daughter. I don't think there's anything better than that — and just seeing where the future of this business is going. I really haven't seen a downside. It's been very rewarding."

Jim Anderson, Ph.D., and Dave Gustafson, P.E., 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. Readers are welcome to submit questions or article suggestions to Jim and Dave. Write to ander045@umn.edu.

Moving Effluent Is More of an Uphill Battle These Days

Today's onsite system designs often require pumps carry water to a higher elevation for distribution. Follow these tips for proper pump selection and usage

By Jim Anderson and Dave Gustafson

We often get questions from homeowners about pump reliability in relation to the need for pumps somewhere in their system. Pumps these days are highly reliable if the correct pump is selected and installed. One pump is needed in most cases, but some systems require multiple pumps. We want to dedicate one column to explaining why we install pumps and some of the aspects for successfully using pumps.

In what we sometimes like to call the "old days," tanks were installed as deep as needed to receive sewage from the lowest level of the house. If the line was exiting from a basement this meant that the tank was installed at a depth of 10 feet or more. This made it very difficult to service the tank, much less repair or fix anything in the tank, such as replace baffles, etc.

While we still occasionally see deep tanks, they are usually the result of older installations. We now recognize the tanks should be installed close to the ground surface, ideally with no more than a foot of cover. This makes it much easier to locate and access the tank for regular maintenance and any necessary repairs.

The shallow location means there is often a sump and pump installed in the basement or lowest level of the house and the raw sewage is pumped up to the tank. A solids-handling pump is required. It is amazing how often we still see sewage effluent pumps or even clean-water sump pumps installed in these situations. They will not handle the solids and will frequently plug.

PRESSURE AND VOLUME

One major concern with pumping raw sewage up into the septic tank is creating turbulence in the tank, interfering with settling of the solids in the tank. If the tank is not allowed to develop the three layers including the clear zone of liquid delivered to the next component, there is the potential for premature plugging of the effluent screen or solids delivered to the drainfield, causing plugging or excessive biomat development.

While we still occasionally see deep tanks, they are usually the result of older installations. We now recognize the tanks should be installed close to the ground surface, ideally with no more than a foot of cover.

If a sewage ejector pump is used, the maximum dose when the pump runs should not exceed 5% of the total septic tank volume. For a 1,000-gallon tank, the amount delivered should not exceed 50 gallons per dose. We always recommend using a two-compartment tank or two tanks in series in these situations to ensure proper settling time is provided. The pump should deliver sewage at a rate of no less than 10 gpm so it will keep up with the discharge rate of appliances, such as washing machines and dishwashers. This is of less concern these days with the advent of low-water-use appliances.

Deep tanks usually meant the soil treatment trenches or bed were installed deep so there could be gravity flow out of tank. The soil treatment and dispersal area was installed below or out the zone in the soil where there would be maximum treatment and often would be in contact or near limiting soil layers such as perched water tables, dense soil layers or bedrock. To avoid these problems, maximum trench excavations are often limited by code to 4 to 5 feet. Installation of shallow trenches, as we recommend, often requires a pump tank and pump to deliver sewage effluent up to a distribution box or dropbox.

WATCH FLOW RATE

When effluent is pumped to a distribution or dropbox for gravity distribution in the trenches, effluent should not be delivered at a rate of more than 45 gallons per minute at the total dynamic head required for the elevation difference and friction in the supply line piping. This rate allows time for effluent to flow out the 4-inch diameter sewer pipe from the drop or distribution box to the trenches.

A reader recently asked if since distribution or dropboxes can have multiple outlets, should the rate should be higher because effluent could flow out more than one outlet? The answer is no, the rate should be based on the scenario where all the flow will exit one pipe. In addition, the flow from the pump should be directed to a wall of the box without an outlet, or a box used with a baffle to dissipate the energy of the water as it enters the box.

If it is necessary to pump to a pressure distribution system, low pressure dose trenches, sewage treatment mound or at-grade system, the pump requirements must meet the necessary flow rate to totally fill the distribution piping and deliver the desired dose amount at the required total dynamic head.

Ideally the pump should only run four to five times per day to maximize pump life. This would require a minimum dose of approximately 25% of the estimated daily flow plus the amount of drainback from the supply pipe. This helps spread the flow out evenly during the day, while at the same time utilizing the whole soil treatment area. In some cases, it is desirable to add an additional tank to store effluent to handle peak flows and provide better flow equalization throughout the day. We will explore the topic of peak flows and flow equalization in a future column.

PUMPS COMMONPLACE

With the advent of additional pretreatment devices (media filters, ATU's constructed wetlands) over the last decade or two, an additional pump has become necessary to move effluent from one treatment component to another. These are designed and specified to meet the specific requirements of the pretreatment device.

Currently it is not unusual to have multiple pumps within the treatment train for systems. Recognizing the specific pump requirements for each situation has now become a necessary skill for any sewage treatment system installer or service provider.

SYSTEM PROFILE

Steep Maine Hillside Requires Carving a Flat Drainfield Bed

Jackson Excavation worked machines carefully in sandy loam while battling a 15% grade during installation of an Eljen system

By David Steinkraus

The house about a half-mile from the Atlantic Ocean had a system dating to sometime in the 1950s. There was a stone bed for the drainfield, and it was time for a replacement, says Jackson Feener, the installer hired for the project. Feener runs Jackson Excavation in South Thomaston, Maine, also the location of the property where he installed this system.

The tricky part of the installation was not the system components but a steep hill. With heavy woods on the land, the new onsite system was placed on the hill that drops from the house to a local road.

System overview

Wastewater exits the house in 4-inch Schedule 40 PVC pipe and reaches the first treatment step, a 1,000-gallon concrete tank from American Concrete in Bangor, Maine. There is a baffle on the inlet and an effluent filter on the 4-inch outlet.

From the tank, pipe runs about 9 feet and then drops 12 feet down the hill to an Eljen GSF drainfield. There it changes to Schedule 25 pipe. Because this system is on a hill, the only pressure on the pipe will come from mowing grass, Feener says, so there was no need for the client to pay for the extra strength of Schedule 40 pipe.

The drainfield is divided into two sections, Feener says, "because it's on a hill and you don't want it to be this big mound sticking out of the ground." Dividing the drainfield, and stepping the two sections down the hill, allows the system to blend into the contour of the land.

In total, the sand bed for the Eljen units is 9 feet wide and 28 feet long. A 4-inch perforated pipe runs the length of the first section. In the middle

« The Eljen units in South Thomaston, Maine, sit on 6 inches of washed sand, with the rest of the bed built with coarse septic sand. (Photos courtesy of Jackson Feener)

» Joseph Feener levels the bottom of the hole with compacted sand, where the new septic tank will be set at the house in South Thomaston, Maine.

» Careful measuring showed there was just enough room for the crane truck to deliver the 1,000-gallon tank for a system set into a hill in South Thomaston, Maine.

of the first bed is another length of 4-inch pipe, that allows effluent to flow down about 4 inches to the second bed.

To build the sand bed, Feener cut a shallow rectangle in the hillside. There's a 5-foot toe on the uphill side and a 23-foot toe running downhill.

Eljen units sit on 12 inches of sand or mixed sand. At the transitional horizon beneath the units, he says, he blended native soil with coarse septic sand (free of rocks but not washed) to a depth of 6 inches so treated water is not stalled by suddenly hitting a different material. Under the GSF units only, Feener uses 6 inches of washed sand. The rest of the bed is built with the coarse septic sand. Cover is about 12 inches of sand topped with 6 inches of loam.

The only piece of equipment Feener used was his 2016 Cat 307E2 mini-excavator with a tilt bucket and thumb, and steel tracks with rubber pads.

"Great little machine," he says. "The rubber plates, you bolt them on to the steel plates, and you can run over pavement, run over lawn, and it's minimal impact. But in the wintertime, up here in Maine, as soon as we get a little snow and ice they're useless."

Joining Feener in doing the work were his father Joseph Feener and his brother Ryan Feener.

Challenges

There was an old septic tank on the property.

"I crushed the old septic tank up, and filled the hole with sand, and put the new septic tank in a new location," he says.

He had to dig down quite a bit for the drainfield, he says. That meant about 18 inches below the planned sand layer for one section of the drainfield, a little deeper beneath the other section. Then he built up with sand. Feener buys his washed sand from State Sand & Gravel in Belfast, Maine.

Working on the hillside was another problem to solve.

"My machine is great, but it does not have a huge amount of reach," Feener says. And he likes the ability to drive all around a drainfield and spread material so his crew doesn't have to push wheelbarrows of sand all around.

System Profile

Location:	South Thomaston, Maine
Facility served:	Single-family home, 2 bedrooms, one bath
Designer:	Ed Green, Union, Maine
Installer:	Jackson Excavation, South Thomaston, Maine
Type of system:	Serial distribution STEP systems, Eljen
Site conditions:	Sandy loam on steep hill
Hydraulic capacity:	330 gpd

Ryan Feener, left, and Joseph Feener, right, level the layer of sand that will support the Eljen GSF units. Under the end drains, installer Jackson Feener uses a special washed sand.

Joseph and Ryan Feener, left and second from left respectively, and Jackson Feener, right, set the Eljen In-Drain units at the house in South Thomaston, Maine. There is a 4-inch drop from the uphill bed to the downhill bed, which helps the finished system to blend in on the land.

To get access on this job, he used the spoils dug from the sand bed excavation to build a temporary road wide enough for his mini-excavator to drive on. He's worked on hills before, he says, but never on such a steep slope. Grade was 15.5%. There were trees, but nothing he felt comfortable using as an anchor for his 18,000-pound mini-excavator.

Before the tank was delivered, Feener says he measured the space available. The crane truck was able to back within 5 feet of the hole. "I had to set one of his outriggers on the bucket of my excavator because it was such a bad drop-off. There was no earth underneath for him to put pressure on."

Properly speaking, that shouldn't be done, he says, but it was necessary to do the work.

> "I had to set one of his outriggers on the bucket of my excavator because it was such a bad drop-off. **There was no earth underneath for him to put pressure on.**"
>
> Jackson Feener

Feener is an old hand at installing Eljen systems. For 2021, he says, his company will probably install about 15 of them. "We live so close to the coastline, most of the designers around here won't give you anything else but an Eljen bed," he says.

Rock beds may be simple, but they require a tremendous amount of space, he says. An Eljen system can fit into small spaces.

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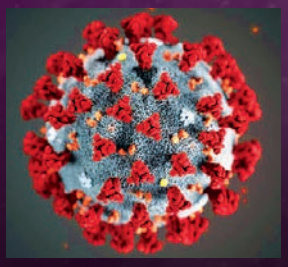

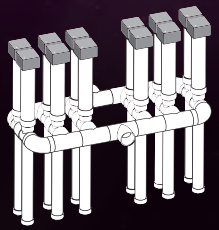

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Federal Infrastructure Act Supports Decentralized Wastewater Projects

By David Steinkraus

The Infrastructure Investment and Jobs Act signed into law by President Joe Biden carries big implications for the onsite industry.

First is a dedicated program for decentralized wastewater systems. The act authorizes $50 million for the next five fiscal years, for a total of $250 million, reports the National Onsite Wastewater Recycling Association. This money will provide grants of up to $15,000 to eligible households for the construction, repair or replacement of an individual onsite system. Money may also be used for larger systems serving two or more households.

Next, the act allocates $7.4 billion to states, tribes and territories for investment in water infrastructure in underserved communities. About half of this money will be available as grants or loans with forgivable principal, said a press release from Colorado Sens. John Hickenlooper and Michael Bennett. The $7.4 billion for 2022 is the first installment of $43 billion coming from the U.S. Environmental Protection Agency to state revolving loan funds.

In Vermont, state government announced its water infrastructure share of the act will be $63 million. As one example of how the money will be used, Neil Kamman, director of the state's Water Investment Division, said the state is creating a program to help residents of mobile home parks with water infrastructure projects. This was reported by the Addison County Independent.

Among revolving loan fund amounts for other states, according to EPA press releases, are Texas, $508 million; New Mexico, $63 million; and Florida, $275 million.

California

Marin County, just across the bay from San Francisco, is considering a law that would require inspections of onsite systems when properties change ownership.

The county's Environmental Health Services division has no records for about 30% of the approximately 8,000 onsite systems in the county, reported the Point Reyes Light. Instead, the county reviews systems when people apply for building permits, but that has caused people to not take out permits because they want to avoid an inspection of their onsite system. County officials estimate about 75% of work in the unincorporated parts of the county is performed without a permit.

Tom Lai, director of the Community Development Agency, said the proposed law would ease the burden on property buyers because they would know what onsite repairs are necessary before they close a purchase. As it stands now, buyers are on their own, and many unknowingly buy properties with malfunctioning systems, he said.

* * *

The North Coast Regional Water Quality Control Board approved a plan that will affect thousands of onsite system owners along California's Russian River and some of its tributaries.

Property owners who have onsite systems within 600 feet of the river or mapped streams, or within 200 feet of ephemeral streams, would have to have their systems inspected every five years. They would have 15 years to correct problems, reported *The Press Democrat*. A community system would be required to correct problems within 20 years.

The California State Water Board must still approve the plan, expected in 2022, and it must be submitted to the U.S. EPA.

Minnesota

The Mower County board changed its subsurface wastewater treatment ordinance to ease the burden on landowners. The county is located along the Iowa border south of Rochester.

When passed last winter, the ordinance was intended to improve water quality by requiring additional onsite system inspections and requiring an inspection when a property was sold. But because there was no limit on what size building would trigger an inspection, many landowners found themselves required to perform an inspection even when applying for permits for small buildings, reported the *Austin Daily Herald*.

Some county supervisors and county staff worked up the changes that passed. Now the law excludes structures of 200 or fewer square feet, and with a height of 14 feet or less. The size limits also include decks. A permit for any structure exceeding the minimums will trigger an onsite system inspection.

New York

The Suffolk County Legislature created a new grant program to help offset the costs of installing advanced nitrogen-removing onsite systems.

Homeowners may receive grants of up to $20,000, and developers may receive up to $10,000 for homes built on previously undeveloped land, reported *Newsday*. Up to $5 million in federal money will fund the grants.

Several environmental groups said they fear the grants will promote development of open space.

Suffolk County, which occupies the eastern end of Long Island, has been struggling for years with nitrogen pollution of its Atlantic Ocean coastline. The county, and several of its municipalities, have passed ordinances requiring nitrogen-removing onsite systems for all new construction and some building expansions.

Florida

Shelley's Septic Tank will pay $82,500 and other provide other relief to settle a sexual harassment lawsuit filed by the U.S. Equal Employment

Opportunity Commission, according to the agency.

According to the lawsuit, the company's male owner made sexual comments to a male employee and inappropriately touched him. Immediately after, the employee informed the local sheriff's office of the problem, the owner fired him.

In addition to the monetary penalty, the company will be required to develop and distribute a written anti-discrimination policy and conduct anti-discrimination training.

Ohio

Mahoning County is introducing a new program that will charge residents for operational permits for their onsite systems. Permits may specify operational parameters and will have a limited life.

The program is mandated by state law, and the county's version took effect Jan. 1, reported *The Vindicator*. Money collected in fees will be used for additional staff and other expenses.

Fee amounts are based on the complexity of systems. For a simple septic system with few mechanical parts, the fee is $25 for a three-year permit. For more complicated systems, mound systems or drip dispersal, and for systems requiring a maintenance contract, the fee is $40 for a one-year permit. And the fee is $125 for an annual permit for systems that already operate under a National Pollutant Discharge Elimination System permit.

Colton Masters of Mahoning County Public Health said the program may save property owners from paying much more because it will help extend the life of onsite systems. And the fees charged are much cheaper than paying for municipal sewer service, he said.

"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.

SNAPSHOT

Challenging Times Approach for the Wastewater Industry

Hiring and training good workers, finding suitable disposal options will continue to dog pumpers and installers into the future

Compiled by Betty Dageforde

In Snapshot, we talk to a member of a state, provincial or national trade association in the decentralized wastewater industry. This time we visit a member of the Oregon Onsite Wastewater Association.

Chris Rhodaback
president and chief executive officer

Business: **A&B Septic Service,** Albany, Oregon
Age: 52
Services we offer: Pumping, system evaluations, system repairs and cleaning, pump repair and replacement, drainline cleaning, location and diagnostics, sand filters and advanced treatment.
Years in the industry: 44 — since 1977. I helped my father, Homer Rhodaback, who owned a portable restroom business, Best Pots.

Association involvement:

I've been a member of the Oregon Onsite Wastewater Association for 15 years. I served as president in 2014, secretary in 2017, and treasurer in 2018.

Benefits of belonging to the association:

O2WA provides a forum for research, the exchange of ideas, information and technology, training and certification, and collaboration for the highest possible standard of safe, sanitary and environmentally sound onsite wastewater services in Oregon.

Biggest issue facing your association right now:

There aren't any education or certification programs to help guys get their operations and maintenance certifications and licenses.

Our crew includes:

David Anderson, general manager; Jane Alexander, septic operations manager; Josh Simmons, Ed Elliot and Jose Sanchez, pumping technicians; Ryan Tyle and Manny Rivas, line technicians; Magnum Miller, Levi Moevao and Michael Sartusche, operations and maintenance, alternative treatment technologies; Denise Street, Jamie Miller, Pamela Platt and Laura Adams, office staff; Todd Chase, mechanic; Larry Chase, waste plant manager; Chris Bohanan, human resources and information technology manager.

Typical day on the job:

I arrive at 7 a.m. and meet with David Anderson to discuss all the companies I own (Septech Technologies, Tank Doctor, Best Pots, Site Locker, Advance Treatment Technologies, Set the Bar Rentals) and the 60-plus employees. Then I might have fieldwork for the day. I work with the mechanic to ensure the 40 trucks in the fleet are working properly. I meet with managers, look over and review evaluations from work performed that day, take calls from line technicians and pumpers who have questions. I talk with vendors and creditors, order parts for various jobs, attend company meetings, write up and review bids for jobs, and review ways to improve the company. I fabricate and build things the company needs, such as portable restroom trailers or lids. And I oversee the onsite waste plant. I try to leave the office between 6 and 8 pm.

The job I'll never forget:

The first time I had to rebuild and replace the pumps and control panels for a 15,000-gallon pump station for a mobile home park. I'll never forget because it was my first one and I wanted to make sure everything was right.

My favorite piece of equipment:

Our new septic service truck — a 2021 Peterbilt 567 from Imperial Industries with a 4,200-gallon stainless steel tank and National Vacuum Equipment pump.

Most challenging site I've worked on:

Every site is challenging and I love that. Every job is like a puzzle that needs to be pieced together to figure out what exactly is going on. The challenge is why I wake up every day. It's fun figuring out the problem and providing the customer with the solution.

The craziest question I've been asked by a customer:

"Why is the septic tank full again when we just had it pumped?" A lot of customers don't realize the septic tank requires a certain level to operate properly. Another crazy question was from a customer who wanted to know

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why the potable water well was running more than usual, thinking the septic system had something to do with it.

If I could change one industry regulation, it would be:

Regarding commercial driver's license rules and guidelines: our drivers can only work 14 hours according to CDL guidelines. If someone has a septic emergency at 2 a.m. and our driver has already worked the 14 hours, we can't service the customer. Our emergencies are hazardous and require immediate attention. We shouldn't have the same rules as a long hauler. We should be able to help all customers and meet all emergencies at all times of the day.

Best piece of small business advice I've heard:

I received this advice from my father when I was a young man. He said, "Make sure there is always a live voice on your end of the phone. You will lose customers if you automate or have a message system." That's why we offer emergency service 24/7 and you will either get a live voice right away or you will get a call back with a live voice ASAP.

If I wasn't working in the wastewater industry, I would:

Own a custom car shop where I could do my own fabrication and engineering.

A&B Septic Service runs this 2021 Peterbilt 567 built out by Imperial Industries with a 4,200-gallon stainless steel tank and National Vacuum Equipment pump.

Crystal ball time – This is my outlook for the wastewater industry:

I think we really have some challenging times ahead. It's getting harder to dispose of wastewater and reuse, it's getting harder to retain and hire good employees. There will always be a need for the wastewater industry going forward, and we plan to be in the forefront as much as possible.

Would you like to see someone in your state or provincial wastewater trade association profiled in Snapshot?
Send your suggestions to Jim Kneiszel at editor@onsiteinstaller.com.

Serving the Industry

Visit your state and provincial trade associations

ALABAMA
Alabama Onsite Wastewater Association;
www.aowainfo.org; 334-396-3434

ARIZONA
Arizona Onsite Wastewater
Reclamation Association;
www.azowra.org; 928-443-0333

ARKANSAS
Arkansas Onsite Wastewater Association;
www.arkowa.com

CALIFORNIA
California Onsite Wastewater Association;
www.cowa.org; 530-513-6658

COLORADO
Colorado Professionals
in Onsite Wastewater;
www.cpow.net; 720-626-8989

CONNECTICUT
Connecticut Onsite Wastewater
Recycling Association;
www.cowra-online.org; 860-267-1057

DELAWARE
Delaware On-Site Wastewater
Recycling Association;
www.dowra.org

FLORIDA
Florida Onsite Wastewater Association;
www.fowaonsite.com;321-363-1590

GEORGIA
Georgia Onsite Wastewater Association;
www.georgiaonsitewastewater.com;
706-407-2552

GEORGIA
F.O.G. Alliance;
www.georgiafog.com

IDAHO
Onsite Wastewater Association of Idaho;
www.owaidaho.org; 208-664-2133

ILLINOIS
Onsite Wastewater
Professionals of Illinois;
www.owpi.org

INDIANA
Indiana Onsite Waste Water
Professionals Association;
www.iowpa.org; 317-965-1859

IOWA
Iowa Onsite Waste Water Association;
www.iowwa.com; 515-225-1051

KANSAS
Kansas Small Flows Association;
www.ksfa.org; 913-594-1472

KENTUCKY
Kentucky Onsite Wastewater Association;
www.kentuckyonsite.org; 855-818-5692

MAINE
Maine Association of Site Evaluators;
www.mainese.com

Maine Association of
Professional Soil Scientists;
www.mapss.org

MARYLAND
Maryland Onsite Wastewater
Professionals Association;
www.mowpa.org; 443-570-2029

MICHIGAN
Michigan Onsite Wastewater
Recycling Association;
www.mowra.org

Michigan Septic Tank Association;
www.msta.biz; 989-808-8648

MINNESOTA
Minnesota Onsite Wastewater Association;
www.mowa-mn.com; 888-810-4178

MISSISSIPPI
Mississippi Pumpers Association;
www.mspumpersassociation.com,
601-249-2066

MISSOURI
Missouri Smallflows Organization;
www.mosmallflows.org; 417-631-4027

NEBRASKA
Nebraska On-site Waste Water Association;
www.nowwa.org; 402-476-0162

NEW ENGLAND
Yankee Onsite Wastewater Association;
(Massachusetts, Connecticut, Maine, New
Hampshire, Rhode Island and Vermont)
www.yankeeonsite.org; 781-939-5710

NEW HAMPSHIRE
New Hampshire Association
of Septage Haulers;
www.nhash.com; 603-831-8670

Granite State Onsite Wastewater Association;
www.gsdia.org; 603-228-1231

NEW MEXICO
Professional Onsite Wastewater Reuse
Association of New Mexico;
www.powranm.org; 505-989-7676

NEW YORK
Long Island Liquid Waste Association, Inc.;
www.lilwa.org; 631-585-0448

NORTH CAROLINA
North Carolina Septic Tank Association;
www.ncsta.net; 336-416-3564

OHIO
Ohio Onsite Wastewater Association;
www.ohioonsite.org; 740-828-3000

OKLAHOMA
Oklahoma Onsite Wastewater Association,
918-727-7113

OREGON
Oregon Onsite Wastewater Association;
www.o2wa.org; 541-389-6692

PENNSYLVANIA
Pennsylvania Association of
Sewage Enforcement Officers;
www.pa-seo.org; 717-761-8648

Pennsylvania Onsite Wastewater
Recycling Association;
www.powra.org

Pennsylvania Septage
Management Association;
www.psma.net; 717-763-7762

TENNESSEE
Tennessee Onsite Wastewater Association;
www.tnonsite.org

TEXAS
Texas On-Site Wastewater Association;
www.txowa.org; 409-718-0645

Education 4 Onsite
Wastewater Management;
www.e4owm.com; 713-774-6694

VIRGINIA
Virginia Onsite Wastewater
Recycling Association;
www.vowra.org; 540-377-9830

WASHINGTON
Washington On-SiteSewage Association;
www.wossa.org; 253-770-6594

WISCONSIN
Wisconsin Onsite Water Recycling Association;
www.wowra.com; 888-782-6815

Wisconsin Liquid Waste
Carriers Association;
www.wlwca.com; 888-782-6815

NATIONAL
Water Environment Federation;
www.wef.org; 800-666-0206

National Onsite Wastewater
Recycling Association;
www.nowra.org; 978-496-1800

National Association of
Wastewater Technicians;
www.nawt.org; 800-236-6298

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Alberta Onsite Wastewater Management Association; www.aowma.com; 877-489-7471

BRITISH COLUMBIA
British Columbia Onsite Wastewater Association; www.bcossa.org; 778-432-2120

WCOWMA Onsite Wastewater Management of B.C.; www.wcowma-bc.com; 877-489-7471

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Manitoba Onsite Wastewater Management Association; www.mowma.org; 877-489-7471
Onsite Wastewater Systems Installers of Manitoba, Inc.; www.owsim.com; 204-771-0455

NEW BRUNSWICK
New Brunswick Association of Onsite Wastewater Professionals; www.nbaowp.ca; 506-455-5477

NOVA SCOTIA
Waste Water Nova Scotia; www.wwns.ca; 902-246-2131

ONTARIO
Ontario Onsite Wastewater Association; www.oowa.org; 855-905-6692

Ontario Association of Sewage Industry Services; www.oasisontario.on.ca; 877-202-0082

SASKATCHEWAN
Saskatchewan Onsite Wastewater Management Association; www.sowma.ca; 877-489-7471

CANADIAN REGIONAL
Western Canada Onsite Wastewater Management Association; www.wcowma.com; 877-489-7471

If you would like your wastewater trade association added to this list, send contact information to editor@onsiteinstaller.com

Distribution Equipment and Systems

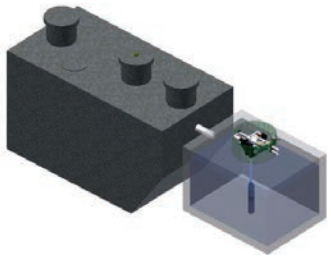
By Craig Mandli

DRIP SYSTEMS

Geoflow Wasteflow

The **Wasteflow** subsurface drip system from **Geoflow** is a way to disperse secondary reclaimed wastewater for commercial, municipal, residential, industrial and agricultural applications. Because the effluent is spread underground, it is absorbed directly into the biologically active soil layer, eliminating surface contamination, ponding, runoff issues and foul odors. It is made for high biological load. The dripline is ½ inch in diameter and made to be buried directly into the soil. Each emitter has a tortuous flow path and, in some cases, a rubber diaphragm, to ensure the rate of flow between the emitter closest to the pump will be the same as the emitter furthest from the pump. Burying the line also makes the drip system an option for areas with regular freezing conditions. Geoshield lining inside the pipe walls is smooth to keep bacteria from sticking and growing inside the dripline. **800-828-3388; www.geoflow.com**

Jet Inc. Drip Irrigation Headworks



The **Drip Irrigation Headworks** package from **Jet Inc.** is designed as a direct-mount device for an effluent pump tank to filter effluent, while controlling pressure to the dripfield. It is available for automatic or manual/continuous flush. These packages contain a 1/2 hp high-head effluent pump, float tree, 1.5-inch vortex screen filter and pre-installed pressure gauges to monitor pressure drop across the filter component and regulate pressure to the dripfield. The package mounts onto an existing 24-inch riser or is pre-installed in a 24-inch riser for easy access to the pump, float tree, integrated vortex filter and controls. The package is available as part of the complete Drip Disposal Field Package that includes integrated controls for the Jet J-1500 or J-1500CF Series Bat Media treatment system. An optional flowmeter package, disc filter and pressure relief valve are also available to meet site-specific and regulatory criteria. **800-321-6960; www.jetincorp.com**

EFFLUENT PUMPS

Crane Pumps & Systems Barnes RAZOR

The **Barnes RAZOR** grinder pump from **Crane Pumps & Systems** is a suitable 2 hp pump for light commercial and residential solids-handling applications. It is designed with axial cutting technology to efficiently reduce solids like flushable wipes, diapers and other nonbiodegradable items. Maintenance is easy and convenient with only a single tool needed for disassembly. The plug-and-play cord also provides easy servicing without requiring removal of epoxy in the conduit. Unlike nonclog pumps with large discharge sizes, its 1.25-inch discharge is suitable for preconfigured packaged systems and turnkey solutions. It is available in the Barnes EcoTRAN Pressure Sewer System, allowing superior waste grinding in tough terrain. It provides a practical and environmentally safe alternative to traditional gravity systems, according to the maker. The numerous configuration options available offer highly customizable solutions. **937-778-8947; www.cranepumps.com**

Liberty Pumps ProVore

The **ProVore** grinder from **Liberty Pumps** is designed for use in applications where the addition of a bathroom or other fixtures below sewer lines requires pumping. It has the same V-Slice cutter technology used in the Omnivore Series. Powered by a 1 hp motor, this smaller grinder is designed to operate on a standard 115- or 230-volt circuit, requiring only a 20-amp breaker. No special wiring is needed. The pump comes with a 2-inch vertical-style discharge and a standard leg pattern matching the LE Series. This allows for an easy retrofit into existing systems, according to the maker. Compact factory-assembled systems are available in simplex and duplex versions: the ProVore 380 and ProVore 680. **800-543-2550; www.libertypumps.com**

PUMP CONTROL PANELS

Alderon Industries VertiMAC Sump Advisor System VM-Series

The **VertiMAC Sump Advisor System VM-Series** from **Alderon Industries** is a float-operated pump switch system used in sump pump or limited space applications. A sensor is attached to the top of the pump switch, which eliminates the need to mount a separate alarm float switch. The sensor integrates high-level alarm and pump-run switches connected to an alarm panel. Water level rises activate the pump switch, and the pump continues to run until the float is deactivated to complete the pump cycle. The sensor sends a signal to the alarm panel, activating the green pump run or red high sump LED indicators. The alarm panel auxiliary contacts are used to connect to BAS systems. It is available in 120/240VAC bare lead (no plug) and 120VAC or 240VAC piggyback plug, 13-amp models. **218-483-3034; www.alderonind.com**

Aquaworx by Infiltrator Intelligent Pump Control

The **Intelligent Pump Control** panel from **Aquaworx by Infiltrator** transforms pump system performance. The easy-to-install panel monitors liquid levels, controls pumping intervals, logs events in real time and calculates daily system flow utilizing a pressure transducer in the pump chamber and an embedded microprocessor in the pump controller. The Aquaworx Tapper handheld Wi-Fi programmer broadcasts a signal that allows the user to program the panel using any Wi-Fi-enabled device. Once connected, the user navigates to a website that has all control settings for the panel and provides the operator with a history of system function critical to troubleshooting and maintaining a pump-driven system. The Tapper is intended for use with multiple panels and includes a USB slot, allowing the user to capture and download system events and settings onto a removable USB memory device. **800-221-4436; www.infiltratorwater.com**

Orenco Systems 4-in-1 Controller

The **4-in-1 Controller** from **Orenco Systems** supports numerous electrical configurations and dosing schedules within a single panel. Both simplex and duplex models are available and can be configured in the field for timed or demand dosing. While the control circuit operates on 120-volt power, the pump circuit is dual-rated for 120- or 240-volt power, meaning installers and service providers can reduce their panel inventories for new installations and repairs. It includes a programmable logic unit with multiple timing intervals for changing flow conditions and has a built-in elapsed-time meter and counter. It also displays float position and has a float error indicator. Each panel includes a reference chart to assist with troubleshooting during installation and testing as well as wiring diagrams. It is completely touch-safe. **877-257-8712; www.orenco.com**

SJE Rhombus Model 122

The **Model 122** control panel from **SJE Rhombus** controls two 120/208/240-volt, single-phase pumps in water and sewage installations. This panel includes a duplex controller for pump control, alternation and alarm. It includes float status LEDs, a control/alarm power on/off switch with LED indicator, pump run LEDs, HOA switches, a pump lead lag selector switch and auxiliary contacts. It includes built-in lag pump delay time, pump failure detection and float out of sequence. In addition, there are four user-selectable field-programmable operations: alarm steady state or flashing; alarm auto reset or manual reset; pump failure notification; and optional seal failure alarm beacon notification or beacon plus horn activation. It is available in the new NEMA 4X enclosure, which is designed for easy installation and additional protection from the elements. It is UL/cUL listed. **888-342-5753; www.sjerhombus.com**

SPI 50B019-120-240DD

The **50B019-120-240DD** control panel from **SPI** is a duplex time-dosing panel for use in residential or commercial applications. It can be used with 120- or 240-volt power, and it accommodates two dosing pumps controlled by a repeat-cycle timer. It has a durable, weather-resistant, NEMA 4X polycarbonate enclosure with SST latches; large, easy-to-access terminal block; circuit breakers for the pumps and control circuits; a rugged, externally mounted, UV-resistant alarm light; audible alarm and run-mute-test switch with UV-resistant sealing boot; definite purpose motor contactors; alternating relay; and pump hand-off-auto switches. Compressor hookups are available. Wiring schematic and detailed connection diagrams are provided, as well as mounting feet for the enclosure. It is UL listed. **419-282-5933; www.septicproducts.com**

SUBMERSIBLE PUMPS

Franklin Electric MagForce

Franklin Electric's MagForce high-efficiency motor systems are powered by a permanent magnet motor with a 90% efficiency rated motor for high performance and long-term cost savings. Each system is paired with a Franklin Electric-engineered drive for intuitive startup and reliable protection for submersible pumping applications. **866-271-2859; www.franklinengineered.com**

Polylok PL-CPE4A

The **Polylok PL-CPE4A** is a submersible, 4/10 hp, 115-volt, single-phase effluent pump with a 2-inch NPT vertical discharge. It has a maximum head of 38 feet and a maximum flow of 56 gpm. The pump is designed with a 3,450 rpm oil-filled permanent split-capacitor motor and has an amp rating of 6.6 for 115 volts, a rugged cast iron housing and volute equipped with a cast iron vortex impeller capable of passing 3/4-inch-diameter solids. The stainless steel shaft is supported by two single-row, oil-lubricated ball bearings. The shaft seal is an inboard design with a secondary Exclusion V seal. It has a 20-foot UL/CSA-listed power cable suitable for submersible service and fitted with a three-prong plug. The unit is supplied with an integrated clip for the included piggyback mechanical float switch and used for automatic operation. **888-765-9565; www.polylok.com**

Vertiflo Pump Series 900

The **Series 900** industrial vertical immersion vortex sump pump from **Vertiflo Pump** provides an unrestricted flow, since the impeller is not normally in contact with the solids being pumped. Applications include chemical slurries, fragile food-processing solids, paper and pulpy solids, petroleum and oils, sewage, wastewater treatment and textiles. It handles solids up to 4 inches in diameter. It is designed for long life in severe services with heads to 170 feet, temperatures to 350 degrees F, and pit depths up to 26 feet with flows to 1,600 gpm. Construction options include cast iron, 316 stainless steel fitted, all 316 stainless steel, Alloy 20 and CD4MC. **513-530-0888; www.vertiflopump.com**

CASE STUDIES

Distribution Equipment and Systems

By Craig Mandli

Water reuse helps Veterans Affairs clinic obtain LEED Certification

Problem: A new VA Clinic in Sedalia, Montana, wanted to reuse water as part of a plan to attain LEED certification under the U.S. Green Building Council. The desire was to collect wastewater from showers and lavatories, treat it to a quality suitable for reuse, and put it back into a separate water system furnishing flush valves in the lavatories. Estimated use by the flush valves is 250 to 300 gpd.

Solution: Engineers worked with Weber Industries to design a BioMicrobics BioBarrier MBR system. This unit is certified to NSF350 for water reuse. A 500 gpd unit was provided in a three-compartment tank. The first compartment receives wastewater, settles solids and is filtered by a Sanitee 1/16th filter as water flows to the second compartment containing the BioBarrier membranes and air grid. Air passing through the grid oxidizes any organics that may be in the water. Water is drawn through the membranes with pores of less than .04 microns by a pump discharging treated water to the third compartment. A **Webtrol Pumps** turbine pumps the water to a pressure tank where it is stored for demand at the flush valves.

Result: At 250 gpd, the clinic can save over 90,000 gallons per year of freshwater. Should water needs increase, the BioBarrier can double that amount. The clinic uses the savings of water resources towards their LEED Certification. **800-769-7867; www.webtrol.com**

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PRODUCT NEWS

PRODUCT SPOTLIGHT

Effluent pumps designed for long life span, heavy use

By Tim Dobbins

Ashland Pump knows downtime is not an option for effluent pumps in municipal, commercial or residential applications where they are frequently used and heavily relied on. So the company builds pumps using products and materials its team believes from their years of research and development provide proper function for the long haul. Users will find the same materials used in Ashland's larger lines on the smaller residential effluent pumps, according to Kim Starkey, the company's product and marketing manager.

Ashland focuses on keeping temperatures down within the pumps to eliminate overheating and improve overall life span. Each effluent pump is built mostly of cast iron, which Starkey says is a contributing factor for keeping their pumps cool. "We use cast iron housings as a way to help dissipate heat that builds up in the motor," Starkey says.

Ashland effluent pumps also utilize a recessed cast iron vortex impeller to move fluids, powered by an oil-filled continuous-duty permanent split capacitor motor. Starkey says motors are chosen because they have low amp draw, creating less heat.

The effluent series has offerings starting at a 3/10 hp high flow pump up to a 1 1/2 hp pump with six other horsepower offerings in between. All pumps are rated for 3/4-inch solids handling. "We have a pump for almost every residential septic application," Starkey says. "And we're currently working on a few additions to the line for more specialty applications."

Standard build for each pump includes upper and lower ball bearing construction, a stainless steel 416 shaft, carbide/carbon mechanical or carbon/ceramic seals depending on the model, 1-1/2-inch NPT discharge on 3/10 hp models and 2-inch on all other sizes. Automatic pumps use SJE Rhombus switches. **855-281-6830; www.ashlandpump.com**

All Roads Lead To Polylok

Polylok 24” Rhino (10 Hole) Distribution Box

The Polylok 24" Rhino Box makes even the toughest applications a breeze with its strength and versatility. The Rhino Box has ten potential openings making it great for any drain field application. Polylok’s 24” stackable riser system can be used to easily bring the Rhino Box to grade. The Rhino Box will accept 2”, 3”, 4” & 6” pipe.

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