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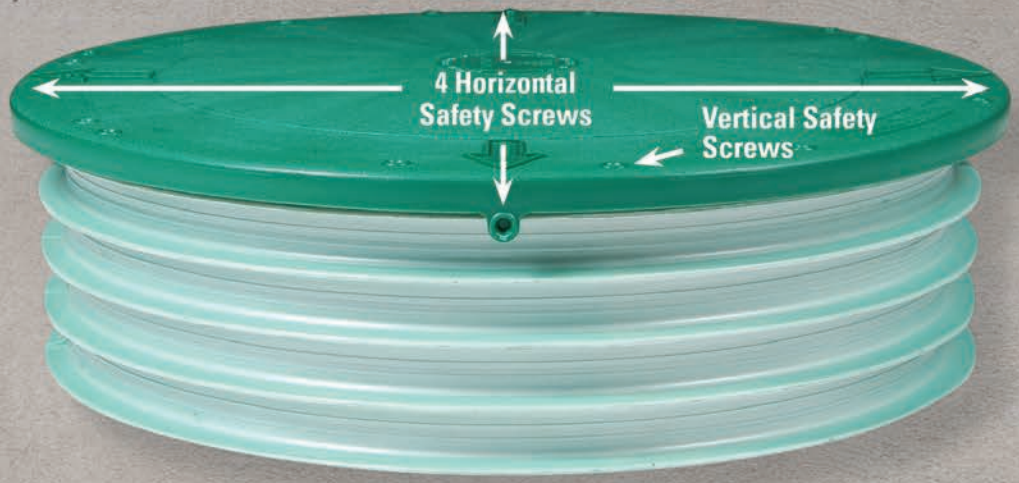

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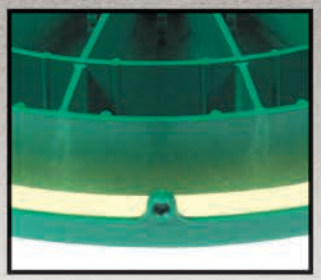

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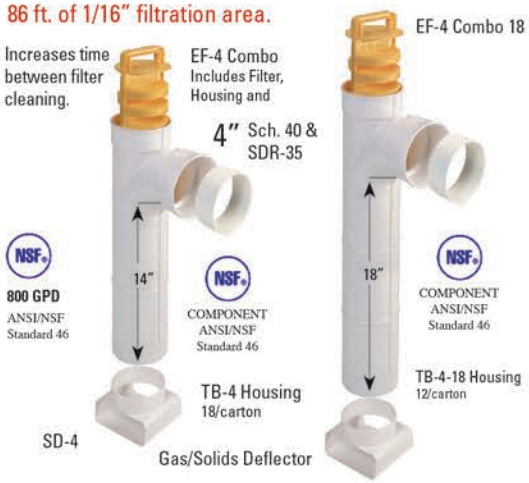

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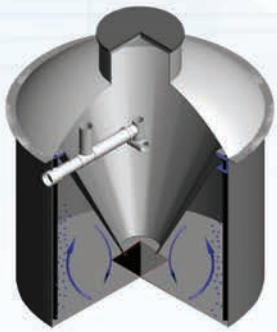

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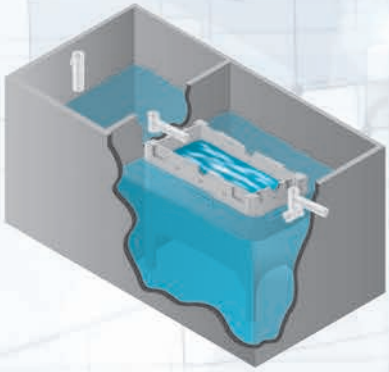

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Working on Water
By Ted J. Rulseh

ON THE COVER:
How many installers own their own fleet of tugboats? The tugs and barges at Coulson Bros. Scow Service transport equipment throughout the Muskoka Lakes recreational area in Ontario, Canada. Russ Brant is shown operating a Cat excavator. (Photo by Bruce Bell)

Coming Next Month

ISSUE FOCUS: Drainfield Media and Design
Contractor Profile: Breaking rocks in Maine
Snapshot: Involve technicians in trade groups

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ADVERTISER INDEX

December 2021

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

Promoting Time of Sale Inspections Is More Important Than Ever

In the midst of an overheated real estate market, the most important message to homebuyers is clear: Don't drop the onsite inspection contingency!

Most of us have probably gone through the nerve-wracking experience of buying a home. It is often said that a home is the most expensive purchase you will ever make. As a caveat, I understand that might not be the case for onsite installer business owners who routinely make major investments in machinery to keep the wheels of commerce moving.

But nonetheless, buying a home is fraught with many risks and potential pitfalls. Are you paying too much? Can you afford the mortgage payments? Are you going to like the neighborhood? Can you be sure there are no underlying problems with the home that could break your family budget down the road?

I have purchased several homes, and I've always at least addressed the last question in that list of concerns by hiring a home inspector experienced in uncovering construction issues to be dealt with before completing the transaction and moving in. And guess what? In each case, these inspections have brought to light specific problems that had to be addressed by the sellers or helped me reduce the purchase price of the home. And it's never been just hundreds of dollars in issues to be resolved, but thousands of dollars.

What about the homeowner who learns after the sale that an aging system is failing and requires more than just a repair, but an entire system replacement? I'll bet many of you have been the bearer of devastating news to recent homebuyers in this crazy market.

So needless to say, I'm a big proponent of the home inspection for buyers. Unless you are a construction contractor yourself, it would always be wise to hire an expert to look for insufficiencies in all the major components of a potential new home for your family, from the roof and gutters all the way underground to the home's foundation … and the topic I'm most concerned with right now, the septic system.

A few hundred dollars spent now can save prospective homeowners huge amounts of money down the road. Some of you currently offer point-of-sale septic inspections, and I'm sure you've been sharing this important message with homeowners as long as you've offered this valuable service. Unlike a leaky roof or peeling paint, getting the right read on the remaining life and previous care of a septic system requires an experienced eye … and I would say that even many general home inspection companies are not adequately trained to look for clues of an abused, neglected or failing onsite system.

DROP THE INSPECTION?

So a growing trend I've been seeing in this red-hot housing market is quite alarming. In an effort to beat competing bidders to the sale, homebuyers have been lifting contingencies for home inspections from their real estate offers. This is a desperate and foolhardy move given the grave financial stakes involved in such a decision. And one we in the wastewater industry should discourage whenever we have a chance.

Forgoing time-of-sale inspections is getting to be a big enough problem that real estate agents like Julie Jalone in Roseville, California, are sounding a warning. Jalone, of Magnum One Realty, recently wrote about the importance of home inspections, and particularly onsite inspections, in hopes that prospective buyers would avoid the financial risks.

"The home inspection is the base and most critical contingency. The inspection is conducted by a neutral professional inspector to assess the major systems of the property. This will include electrical, plumbing, roofing and structure. Without this contingency, the buyer has no recourse on issues and problems with the house," she explained on the *Roseville Today* website.

"This is also true for waiving the buyer's ability to request the seller to make repairs. This is an important secondary negotiation between the parties. Many sellers are now demanding 'as is' sales and the buyer agreeing not to ask for repairs. Buyers may consider this but should never remove the inspection contingency."

Jalone said inspections are most critical for well and septic service.

"Wells and septic systems are vital elements of the property. Issues with these systems can be health-related and expensive to fix. Septic system repairs can cost thousands of dollars," she said.

THE MONEY PIT

We in the onsite industry know the stakes are even higher than Jalone realizes. What about the homeowner who learns after the sale that an aging system is failing and requires more than just a repair, but an entire system replacement? I'll bet many of you have been the bearer of devastating news to recent homebuyers in this crazy market: "I'm sorry, you will need a new septic system. It can't be installed in the same location as your existing system, and your lot isn't big enough for a second drainfield."

Alternatives in this case may be few and undesirable to the homeowner. If they're lucky, you can design an advanced treatment system that will fit in the small footprint but will cost more than the homeowner is expecting. Or maybe a municipal system will soon be expanding into the neighborhood and could be accessed, also at great cost. Failing that, you don't want to be the contractor telling the homeowner that a holding tank is their only solution.

In a recent advice article, Dan Steward, president and CEO of Pillar To Post Home Inspections USA, also warned about skipping time-of-sale inspections. He shared a transaction story worthy of the 1980s comedy movie, *The Money Pit*, which followed the travails of a hapless couple (played by Tom Hanks and Shelley Long) who got more than they bargained for when buying that quaint house in the country.

Steward explained that a Brampton, Ontario, buyer waived the home inspection at the seller's request to secure the deal. When the family moved into the house, they found out they had no well water supply.

"Worse, they discovered that they had to have the entire septic system replaced — at a cost of $120,000. This is something a home inspector would have easily caught. The couple eventually had to take out a mortgage just to pay for the new septic system," Steward said.

Septic inspections can also save your customers from being caught up in a house-flipper's nightmare like the one experienced by Army veteran Jonah Huggins in Florida. As reported by WFLA-8 in Tampa, Florida, Huggins bought a home renovated by a flipper before he discovered it was served by a septic system and not tied to the city sewer as the seller disclosed. The buyer spent $30,000 to connect the house to city sewer, money he was hoping to recover through a lawsuit.

CONSUMER EDUCATION

What can you do through your onsite business to help consumers avoid these unfortunate situations?

First, figure out if the demand for septic inspections is being filled in your area. If there is a need and you don't already offer inspections, consider adding it to your menu of services. Inspection service could be a valuable way to diversify your services and make great connections for future work. Who better for a homeowner to trust for installing work down the road than the contractor who provided a key inspection service in the past?

If inspections are already part of the service you provide, make sure people know how important they are, even in this challenging buyer's market. Promote your service and share real estate inspection tips through social media channels. Offer to present seminars explaining how time-of-sale inspections are conducted. Contact general home inspectors and offer to partner with them to lend your specific expertise in wastewater treatment where it would help.

Network with local real estate professionals to build awareness about decentralized wastewater treatment. I have heard installers complain about real estate agents resistant to adding another layer of paperwork to the home-selling process. But real estate agents should understand that protecting both the buyer and the seller in this major transaction will reflect positively on their service and reputation as quality agents. It should be a goal of everyone involved to avoid disputes that wind up in the courtroom. Getting out in front of real estate agents with an educational message about septic systems would help your entire community.

IT'S ABOUT CLEAN WATER

Inspections — both at the time of a sale or as part of a maintenance program — ensure two important goals that onsite professionals care about: a cleaner environment and protection of the onsite system owner's investment. It's troubling that buyers and sellers would give up this vital protection no matter how badly they want a sale to go through. And if this trend continues, both our groundwater and homeowners' pocketbooks will suffer in the years to come. ◻

DROP US A LINE

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"Users should consider selecting a trailer that accomplishes 80% of their moves and subcontract the highly specialized loads to an outside hauler."

– Selecting the Right Trailer for Hauling Heavy Equipment
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FINDING A SOLUTION
Advanced Phosphorus Removal
On sites that have limited appropriate soil and/or high water tables, extra steps often need to be taken to enhance phosphorus removal. There isn't one simple solution in single-home systems but phosphorus removal from wastewater can be achieved using multiple techniques. This online article gives an overview of the options and status of these technologies. onsiteinstaller.com/featured

BE PREPARED
Future-Proof Your Business
None of us can predict what tomorrow will bring. Uncertainty is scary for anyone, but it can be especially daunting for business owners. The good news is that, even if you can't say for sure what the next season will bring, you can take reasonable steps to secure your business for the long haul. This is a process that's often called future-proofing, and it's something worth investing in right here and now. This online article outlines a few strategies to consider. onsiteinstaller.com/featured

KNOW YOUR LIMITING CONDITIONS
Soil Color and Septic Installation
Determining the seasonal high water table and depth to limiting conditions is critical for onsite system design. From an installation perspective, it's important to recognize soil colors and their meanings. This article from Sara Heger walks through the most common ways to determine the SHWT and other soil criteria to keep in mind on your next install. onsiteinstaller.com/featured

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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.

When Do You Give Sewage a Lift?

Strategic pumping of effluent along the treatment train will improve downstream flows

By Jim Anderson and Dave Gustafson

In recent columns, we focused on pumping into drop boxes and then utilizing flow by gravity into sewage treatment trenches. We wanted to follow up with a general discussion of pumping situations an installer or service provider may encounter and how and why pump requirements are different for each situation. In some applications, more than one pump is required.

There are some common elements to all pumping situations, involving four components: a pump tank or sump; a discharge assembly; pump controls; and the pump. The most trouble-free pumping situation is to pump sewage effluent after solids have been removed. Except for one notable exception, most pumps in our systems are used to pump effluent.

The major exception is when there is a lower level in the house and raw sewage must be lifted to the septic tank at a higher elevation. Effluent from the septic tank at a higher level can then either flow by gravity into drop boxes and trenches if there is suitable soil, or flow into a pump tank and effluent pumped to trenches higher in elevation or to a pressure distribution system.

PUMP TO ELEVATION

Raw sewage is collected in a sump in the basement or walk-out level, and a sewage ejector pump is used to deliver sewage from a sealed, vented sump to the septic tank. The sump is vented back through the plumbing stack. The amount of sewage delivered to the septic tank each time the pump runs should be less than 5% of the septic tank operating volume. This is to minimize disturbance in the tank interfering with solids settling. It is recommended a compartmented tank or two tanks in series be used to provide the septic tank volume.

An advantage of this scenario is that the septic tank is installed shallow, allowing the opportunity to deliver effluent from the tank by gravity to the rest of the system. In addition, having the pump in the basement means it is readily accessible for maintenance or replacement. Also, until the pump is replaced most of the plumbing system can continue to be used.

Another option to pump to a higher elevation is where raw sewage flows by gravity from the house to the septic tank, then by gravity to a pump tank, where it is delivered to a drop box. Flow from the drop box occurs by gravity into a sequence of trenches. This allows location of the soil treatment area in suitable soils at an elevation higher than the septic tank and pump tank. And the sequence allows easy access to septic and pump tanks near the house for maintenance.

We like to talk about a pump having two names that define and identify the size of the effluent pump needed for the situation. In this case, any pump selected to lift effluent to the trenches will have to have a pump curve that indicates it will deliver 10 to 45 gpm at a total dynamic head, reflecting friction loss in the piping and the elevation difference between the pump and the drop box.

The minimum rate is set so it keeps ahead of high discharge appliances such as automatic washers or dishwashers. The maximum rate is so sewage effluent will have time to flow out of a single 4-inch pipe outlet to a gravity sewage treatment trench. In addition, the discharge line from the pump must be directed against a wall of the drop box where there is no outlet or into a device installed to dissipate the force from the pump.

Another scenario is where a pump is used to deliver effluent to a pressure distribution network. The network can be in another pretreatment device such as a media filter, mound or at-grade system. In the case of the additional pretreatment device, flow out can be by gravity if appropriate, or will require an additional pump to the final dispersal and treatment area.

BY THE NUMBERS

Each of these situations have their own unique sizing specifications depending on the network. The amount of effluent must fill up the piping and meet the discharge rate requirements based on the size and number of orifices. It also must operate with the necessary head based on elevation difference, friction loss in the pipes and the required head at any distribution manifold.

In these situations, the pump and the distribution network operate together, and when a pump needs to be replaced it is critical the pump meet the system specifications according to the initial design. It is important for the installer to keep a record or copy of the design specifications for your files as well as provide them to the homeowner. This gives future service providers the opportunity to look in two places for design specifications. We all know maintainers are met with a blank stare when asking homeowners for information about their systems. It's also important to leave your contact information where it can be found when the system is accessed so you can be contacted. ☐

A Coulson Bros. Scow Service barge loaded with equipment is pushed to a commercial landing to work on an onsite system project. (Photos by Bruce Bell)

WORKING ON WATER

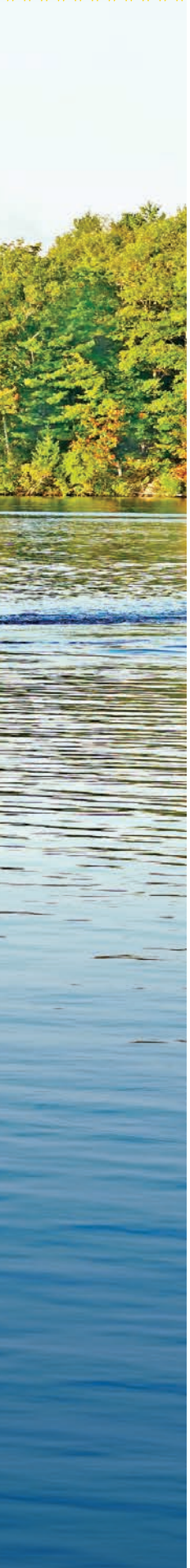
Canada's Coulson Bros. Scow Service specializes in complex onsite systems for island homes in the upscale Muskoka Lakes region

By Ted J. Rulseh

A wealthy gentleman about to close on the purchase of an island in a Canadian lake wanted to be sure there was room for a 4,000-square-foot house and a septic system.

The real estate agent called Arnie Coulson and asked him to go to the island and investigate. About 20 minutes later, to the buyer's amazement, Coulson called back with an answer.

"It just happened that I was in between tasks and it was a beautiful sunny day," says Coulson, co-owner of Coulson Bros. Scow Service in Milford Bay, Ontario. "It was two-minute drive down to the dock to get in my float plane. The flight took about four minutes. I did a bunch of measuring, and 15 minutes later I called the real estate agent and said, 'Yes, we're good.'



Coulson Bros. Scow Service

Milford Bay, Ontario, Canada

Owners:	Arnie Coulson, Keith Coulson, Donna Coulson
Founded:	1969
Employees:	46
Service area:	Lakes Muskoka, Joseph and Rosseau, north of Toronto
Specialties:	Installation on water-access-only sites, difficult-to-reach shoreline lots, and islands
Affiliations:	Ontario Onsite Wastewater Association
Website:	www.coulsonbros.com

"The gentleman had a hard time believing I was on the island because the drive up there would have taken an hour, and then you would have to find a boat. He said, 'You're going to be doing all my work from now on.'"

The man bought the island, and Coulson Bro. installed a 7,500 liter-per-day (2,000 gpd) onsite system with a Waterloo Biofilter treatment unit, along with steel docks and all landscaping on the property. It's the kind of customer service that has made this third-generation, family-owned company a fixture in its territory for more than 50 years.

THE LAKE COUNTRY

Coulson Bros. specializes in systems for island homes in lakes Muskoka, Joseph and Rosseau, a combined roughly 100 square miles of water about two-and-a-half hours north of Toronto. The area, known as Muskoka Lakes, has become a worldwide visitor destination.

Around the turn of the 20th century, industrial titans from Pittsburgh built summer homes there. "Then they started putting up massive hotels," says Coulson. "It became a tourist area, and everyone wanted their little piece of Muskoka. People call these places cottages, but they are borderline estates. It's not uncommon to see a 7,000- to 8,000-square-foot cottage."

Installing onsite systems for these homes is a logistical challenge few contractors face. All equipment and materials have to cross the lakes in barges pushed by tugboats. Coulson and his brother Keith custom-built most of those conveyances. There are 10 barges, on average 25 by 75 feet, fabricated from 5/16-inch steel plate.

The eight tugboats average 33 feet long with a 10-foot beam, and draft about 40 inches of water. They are powered by 300 hp Caterpillar or Cummins diesel engines.

"We started the first tugboat in 1989 and finished it in 1992," Coulson says. "It was patterned after an old steam tug that plied the lakes way back at the turn of the century. We didn't just build boxes; we tried to add some flair. Each of them has some personality. They all have names with some significance to us personally."

PROUD HERITAGE

Ken Coulson, Arnie's father, started the business in 1969 after serving in the Royal Canadian Navy and living for a few years in Hamilton, Ontario. "He moved back, bought a barge, and the rest is history," says Coulson. "He figured out what he was going to do, and

Operator Kevin Coulson uses a John Deere excavator to distribute sand at an installation site.

"It has always been a challenge developing these properties, **and the complexity of the systems has increased over the years."**

Arnie Coulson

Sebastian Sayers levels sand material during an onsite system installation for Coulson Bros. Scow Service.

Operator Kenny Robinson unloads a barge used to transport Coulson Bros. equipment to a remote onsite install.

the timing was good. This area became more and more desirable. With proximity to Toronto and its financial sector, it became the go-to place to have a cottage."

The elder Coulson was among the first to install what is known as a Whitby Class 4 filter bed on an island, working under Ministry of Environment supervision. The system is similar to the Wisconsin mound; it's built with a grade of sand found near Whitby, Ontario, that passes a sieve test for fines. "You basically dig a hole or create a pocket and add 30 inches of Whitby sand," Coulson says. "You layer it in and level it. Then then you put a 12-inch layer of free-draining stone on top and suspend the pipe in it. That is followed by filter cloth, sand, and a topsoil cover."

Arnie and Keith began working for the company during summers while in high school, then joined full-time. In 1992, their father retired and they took ownership; they worked in the field while their sister, Donna Robinson (not active with the company but still part owner), ran the office.

"When we took it over, our dad had two barges, and we had four employees," Coulson recalls. "My brother and I ran with it. We started taking on larger projects. We bought our first tracked excavator around 1993. Until then it had been just backhoes. From that point, we kept building." The company now has more than 40 employees; a steel dock division keeps the team members busy during the winters.

LAKE ACCESS

The company's tugs and barges travel throughout the three lakes. Lakes Rosseau and Joseph are connected by a canal. Lake Muskoka is connected to the other two by a large lock and a small lock; the barges are sized to go through the large lock.

Coulson Bros. has its own commercial landings on Lake Joseph and on Lake Muskoka and can use various public landings. Each barge has two 4-foot-by-20-foot independently hydraulically operated ramps at the front for loading and unloading.

Alternative systems are more the rule than the exception on the islands. "It's a unique area," Coulson says. "We have a lot of pine trees and a lot of bedrock. Soil conditions aren't necessarily the greatest. It has always been a challenge developing these properties, and the complexity of the systems has increased over the years. Everything is dictated by flow rates, which are determined by the sizing of the cottages and the number of fixture units."

A typical system requires more than one barge load. "If we're doing a little two-bedroom system," says Coulson, "we can just about get it all on one barge. But if we're into clay soils or the site is mostly bedrock, and we have to import a lot of sand fill, that's different." The largest barge can carry as much as eight 20-ton loads of sand, delivered on Western Star tri-axle trucks from another company subsidiary, Muskoka Disposal.

The barges also carry a wide variety of machinery, including excavators as heavy as 45 tons.

Onsite systems mainly use plastic septic tanks supplied by Roth Global; drainfield media is stone; piping is PVC. Where conditions call for advanced treatment units, the Coulsons prefer Waterloo Biofilter units; they also install Ecoflo (Premier Tech Water and Environment) peat and Aqua-Aerobic Systems products depending on site conditions. Coulson sees and welcomes a trend toward more systems with treatment units.

Waterloo Biofilter modular flatbed systems are built with lightweight fiberglass shells that contain the filter media. The Coulsons typically install systems no smaller than 800 gpd, up to 2,641 gpd. Any system larger requires engineering and permitting through the Ministry of Environment.

STAYING COMPLIANT

Coulson Bros. enjoys close relationships with regulators in the various jurisdictions. The Ontario Building Code dictates the minimum septic system design standards, but townships have their own requirements as well.

In a typical case, Coulson drills test holes to evaluate the soils, calculates the system flow and the soil percolation rate, creates the design and sends a permit application to the township. Next comes a meeting at the site where he and the local regulator review soil conditions and discuss the design. Assuming all is agreeable, the permit is issued and the project is placed on the work schedule.

Setbacks from the water can pose challenges on some sites. The Ontario Building Code specifies a 50-foot setback, but several townships

Arnie Coulson is shown with his Cessna float plane at the company's landing in Milford Bay, Lake Muskoka, Ontario. The plane is integral to the company's work on many island onsite installations.

KEEPING IT NATURAL

Besides dealing with rugged topography and challenging soil conditions on lake islands, Coulson Bros. Scow Service strives to limit impacts on lake quality and scenic values.

That's to comply with local regulations, but also to respect the features that make the area attractive to residents and visitors. Co-owner Arnie Coulson observes, "It's very important, for us as a family here for five generations, and for our clients, to preserve the natural character of the properties."

The local jurisdictions where the company works have different regulations, but generally they require a site plan before work on a property begins. "In one jurisdiction, in order to cut trees down on the front of a property you have to go for a bylaw exemption," Coulson says. "Some municipalities are a little more forgiving.

"Cutting trees and planting a lawn to the water is very frowned upon here. A lot of it has to do with the quality of the lake. There are several lake associations that take water samples and monitor the lakes' health. They issue report cards on each of the lakes. The municipalities have identified what they consider lakes that are at the threshold, approaching the threshold, or over the threshold for development."

Coulson notes that despite the need to do "some pretty industrial things" on properties — hauling in fully loaded cement trucks, pumping concrete, blasting rock — the company tries to tread lightly. "We have a division called Coulson Bros. Arboriculture. We have arborists on staff, and we do tree health care. We come up with a tree plan. Sometimes we identify and tag trees and make plans to fertilize them for construction stress.

"Depending on the topography and the steepness of the slope, we recycle chipper mulch and use that as the aggregate base for our access roads. It's compost that goes back to natural; it helps protect the root systems of the trees while we're there on the property. The official plans of these townships are forever evolving as they try to maintain the natural character. Everybody recognizes that's the reason people want to be here; let's not wreck it. It's a delicate balance."

Kevin Coulson, Arnie Coulson and Sebastian Sayers review an installation of a Waterloo Biofilter Systems unit at a vacation home compound on an island in Lake Rosseau, Muskoka, Ontario.

in the Muskoka region increased that to 100 feet at the request of the lake association and out of environmental concern. Where site conditions make it impossible to meet the setbacks, property owners can appeal to the town council.

Townships also seek to minimize phosphorus discharges to the lake; that generally means limiting impervious surfaces to help prevent runoff. "If we're landscaping with flagstone rock, we leave the joints between the flagstones open, so that when rain comes it percolates down and dissipates into the soil," Coulson says.

To no surprise, these island septic systems are costly; prices generally range from $25,000 to $85,000 (Canadian dollars). The work also requires creativity: "We've tried to be very progressive. Because we're in such a unique field of work, we've had cases where the equipment we needed wasn't available, and we made our own.

"We converted a fleet of John Deere log-skidders by adding boxes to them, so they are like miniature off-road articulated dump trucks. We have six of them with 5-cubic-yard boxes. We dump all the soil on the barge, we go to the island and we have a John Deere skid-steer on the barge that loads the skidders. On the job site, we scoop the material out with an excavator.

"It's not like the equipment drove the development of the business. The development drove the equipment," Coulson explains. "We've had to scale our barges up a little bit to keep up with the equipment needs of these projects."

The equipment fleet includes:

- 23 excavators, 1.5 to 23 tons, mainly John Deere, Caterpillar and Kobelco
- 12 John Deere skid-steers on tracks and wheels
- 6 John Deere skid trucks
- 6 tracked dumpers (Yanmar and Canycom)
- 2 Western Star tri-axle roll-off trucks
- Freightliner truck

"It's not like the equipment drove the development of the business. The development drove the equipment."
Arnie Coulson

TAKING FLIGHT

Coulson's float plane, which he flies mainly for pleasure, plays no small part in the equipment fleet. It's a fully restored 1964 single-engine Cessna 180 Coulson has owned for 10 years. It helps him save time, especially when there's a need to respond to a customer, or help a work crew that has experienced an equipment breakdown or some other problem on a site.

In one case, an architect, a homeowner, and a building contractor were meeting on a site; they called to ask a question. "I said it would be better if I was there," Coulson recalls. "They said, 'OK, we're going to be here for a couple of hours figuring this out.'

"I jumped in the airplane, and I was there in seven minutes. I landed, and the owner came down and said, 'I have never in my life experienced this type of customer service.' "It's not that the plane gets used for work a lot, but when your whole business revolves around water-access properties, it's a great convenience."

And it's a convenience for customers to have a company like Coulson Bros. to provide wastewater treatment for their island getaways.

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(See ad on page 37)

Brigette Hyacinth

Hard To Find and Retain Good Workers? Treat Them With Respect

Attracting and keeping quality members on your team has never been more challenging. Follow these tips to improve job satisfaction

By Brigette Hyacinth

Many companies invest heavily to improve the customer experience but sideline employees who are responsible for delivering that experience. What some business leaders forget is that their employees are their first and most important (internal) customers. This can seem especially true these days as installers struggle to keep crews intact and on the job every day.

If your workers don't believe in your business, the quality of their work will be poor or they may look elsewhere for employment opportunities. Business success starts with the employee experience. When employees are happy (feel valued, welcome, respected, heard), they will create remarkable experiences for your onsite customers.

RAISE MORALE

You can't expect stellar customer service from employees who feel distrusted and discounted. Successful businesses focus on creating memorable employee experiences to keep their staff engaged and happy. Several years ago, Airbnb announced it was appointing a Global Head of Employee Experience. The following year, the company topped Glassdoor's list of the 50 Best Places to Work.

Instead of following the traditional business model, Airbnb creates change and empowers employees at all levels, which has a huge effect on the success of the company, both monetarily and culturally. What are some ways you can have that kind of impact on your workers in the onsite industry?

Always be quick to recognize and reward the efforts and contributions of employees. Nothing says we value you like showing how much you appreciate them. Employees spend half of their lives at work. It should at least be a pleasant experience. When workers are treated unfairly and as "second-class citizens," the result is decreased employee morale.

Low morale results in decreased employee productivity. Moreover, dissatisfied employees will share their negative work experiences with family and friends, thus turning away potential customers and employees. The employee experience is influenced by three factors:

1. The physical environment in which employees work
2. The support and tools an employer provides
3. How an employer takes an interest in the well-being and success of employees

Employees spend half of their lives at work. It should at least be a pleasant experience. **When workers are treated unfairly and as "second-class citizens," the result is decreased employee morale.**

I'll share an example to illustrate my point. A retail store stated their employees were the "heart of the business." The retail area was clean and well stocked. Aisles were wide and well-marked with bright signage. Even the parking lot sparkled — there was rarely any litter seen in customer parking areas. Customers were impressed.

However, employee space was a different matter. Stock rooms were cluttered and dark. Staff locker rooms were poorly lit and maintained. The break room was bleak, with old, uncomfortable furniture, and trash bins overflowed. Even the vending machines were inadequately stocked with only junk food.

The message was clear — the company cares more about customers and less about employees.

IT'S YOUR TURN

So how can you ensure you're treating employees as your most loyal customers? Try these solutions on for size:

Engage your crew in this conversation. No one knows how to upgrade the employee experience better than your employees themselves. Ask them what they love about working in the company and what they would want you to do differently to reduce frustrations and improve work conditions. Listening is crucial.

Involve employees in decisions. Grant your staff autonomy and flexibility. Show you trust them to do the job you hired them for. Employees want to know their voices are being heard and their opinions matter. Provide consistent communication and a culture that welcomes feedback

and employees won't feel like their kept in the dark. Employees who are involved in any aspect of the company feel ownership.

Be authentic. The driving force behind everything you do should be creating an atmosphere where workers feel like they belong. With a strong purpose, employees can easily see why leaders are doing what they are doing. Take action. Observe closely. Refine systems, policies and practices to honor employees. When people see you are sincere, you will get employee buy-in and win their trust.

Show them you care. Your team members want to be treated as human beings. They have feelings, emotions and personal lives. When employees are facing personal issues (illness, family crisis, bereavement), be empathetic. Inflexibility and insensitivity will cause employees to withdraw and become disengaged.

SHOW RESPECT

When employees are consistently treated with trust, dignity and respect, they respond by giving their best. They care about the business, their colleagues and their customers. Employees demonstrate that care by serving customers wholeheartedly, solving problems quickly and working cooperatively. If you want to get the best from your employees, treat them like your most loyal customers!

About the Author

Brigette Hyacinth is a leadership expert, keynote speaker and author of the book Purpose Driven Leadership. *Reach her at brigettehyacinth@mbacaribbean.org.*

2021 ONSITE INNOVATIONS

Competent contractors in the onsite industry demand quality products.

See how these partnerships ensure success in this special Onsite Innovations section.

Retrofit Parts Extend the Useful Life of Septic Tank

After pumping a 41-year-old septic tank, a pumper had observed that there was no inlet or outlet baffle in this old single-compartment tank. The pumper had informed the homeowner of this condition. The homeowner, stunned at the cost of a new tank and possibly a new leachfield, then asked "what is my other choice?" The pumper replied that he would not feel good about letting it go as-is. He knew Polylok had some great retrofit parts that just might work here. The pumper and homeowner decided to use the much lower cost option of extending the useful service life of both the tank and the field.

The pumper opted to use a Polylok Extend & Lok at both the inlet end and outlet end of the tank. Because the inlet pipe was made of cast iron, this made an easy decision. After breaking off the deteriorating pieces of the cast iron pipe, and somewhat cleaning the inside of the pipe, the 4-inch Extend & Lok was simply hammered inside the exposed end of the pipe. This provided a perfect PVC 4-inch Schedule 40 pipe surface to glue on a Polylok PL-68 tee for an inlet baffle.

This same installation procedure was done on the outlet side as well; the difference being that the outlet pipe was already a 4-inch Schedule 40 pipe (as there must have been some type of previous repair done). However, it was too close to the inside of the tank wall to solidly glue on a tee or filter housing. Fortunately, the Polylok Extend & Lok is designed for all 4-inch pipes. It was hammered into the end of the outlet pipe to extend it away from the inner wall. A PL-122 filter and housing was then glued to the Extend & Lok.

The project was finished off using Polylok adapter rings, risers to grade and covers. Typical cleaning of this septic tank and filter was performed approximately every three years. Polylok covers and risers made that a simple task. The last inspection on this tank occurred in August of 2020. Upon inspection, everything was still in perfect working order. That was 16 years later, and who knows how long the life of this tank and field have been extended for?

Tuf-Tite's New Look

Years ago, Tuf-Tite invented the first riser safety pan, allowing a concrete safety lid to be cast into a plastic riser system that could be placed anywhere in the column of risers. It's a design so innovative, it remains an industry standard.

Now the company is innovating once again. Tuf-Tite took the next step to make the first plastic internal safety lid for protection.

Tuf-Tite engineers knew that the original web design was extremely strong in the riser, but what about out of the riser? What if the internal safety lid was damaged in the field? Could it be reused? Others were using a similar web design, but Tuf-Tite moved in a new direction.

Tuf-Tite's new internal safety lids sit in the riser on four ledges. The solid safety lid features an inspection port, screw or bolt holes to fasten the lid to the riser, and concrete keepers that can hold 40 pounds of concrete. This design has proved to be one of the strongest safety lids on the market, in the riser or out of the riser, according to a company spokesperson.

Tuf-Tite requires that the internal safety lid be screwed or bolted down to the ledges on the riser below. For added safety, the Tuf-Tite safety lid can be filled with concrete, adding an additional feature unique to Tuf-Tite.

Every Tuf-Tite riser lid and safety lid comes with all the screws, including the horizontal safety screws for domed and flat lids.

Tuf-Tite manufactures a full line of patented septic and drainage products, which are among the best in their respective industries. From the innovative distribution boxes that have become an industry standard, to the patented effluent filters that prolong the life of septic fields significantly, each of Tuf-Tite's products are engineered and manufactured to exceed expectations in both performance and longevity.

TUF-TITE®

Tuf-Tite produced its first product in 1984. Years of polymer formulation experience and field testing have strengthened the full line of products the company produces today. Tuf-Tite is an American-owned and -operated company and all polymer products are manufactured in Lake Zurich, Illinois, where the modern and highly automated manufacturing, warehouse and shipping areas are all contained under one roof in a 165,000-square-foot facility. The company is fully capable of servicing any and all demand for Tuf-Tite products. Its automated supply chain capabilities provide customers with seamless on-time deliveries.

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System Installation Utilizes Frozen Lake to Transport Materials and Technicians to Remote Island for Installation

Farm Island sits in Farm Island Lake north of Minneapolis, where most installation work stops during the winter. When Septic Check of Milaca, Minnesota, was contracted to design and install a new onsite system for a 1,400-square-foot year-round residential dwelling on the island, it took an unusual step by waiting for winter to enable transporting project materials over the frozen lake to the remote island site.

Why select an ATU?

Providing a suitable environment for microorganisms to treat wastewater is what ATUs are all about. These pre-engineered, advanced wastewater treatment systems are the best alternatives in small system designs that have space restrictions and no room for conventional treatment or where centralized sewerage is not available. ATUs are applied on sites with poor soils, shallow vertical separation distances to limiting conditions, and horizontal setback restrictions. Some systems can be designed for the treatment of high-strength wastewater or where total nitrogen removal is required.

System details

An ATU system was the ideal choice for this installation because Minnesota regulations require a minimum separation of three feet between a conventional system drainfield and the water table. By choosing an ATU and including a UV lamp, the required separation was reduced to 1 foot. The wastewater treatment system is 250 feet from the lakeshore. Wastewater exits the house via 12 feet of PVC pipe to the first of three Infiltrator IM-1060 1,000-gallon tanks, where settling and anaerobic treatment occurs. Wastewater then flows by gravity into the second tank where a Delta ECOPOD E50 ATU provides aerobic processing. It leaves the ECOPOD and flows by gravity through a SALCOR UV light to the last Infiltrator tank and is then pumped 65 feet through a 2-inch pipe to the absorption field.

The 585-square foot absorption field uses 200 linear feet of EZflow geosynthetic aggregate divided into three beds fed by a manifold of 2-inch pipe. Varying bed sizes maximized the small patch of good soil available on the 1-acre lot. The system is controlled by a Delta Treatment Systems control panel.

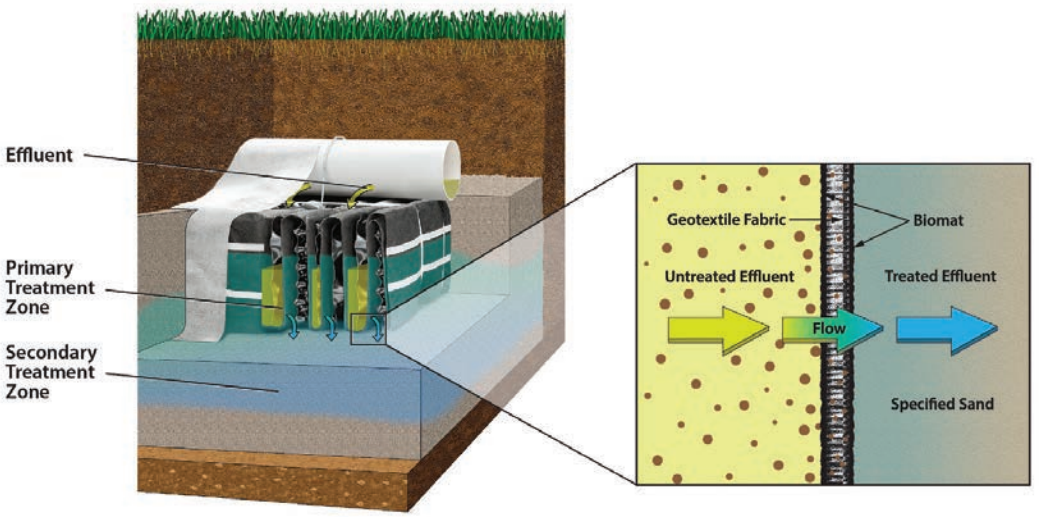
System installation

Septic Check used a snowplow truck to create a 3,400-foot-long road across the ice to the island. Equipment and supplies were driven across the frozen lake on a trailer and technicians commuted by snowmobile. An auger was used regularly to bore holes to check the thickness and quality of the ice and ensure safety. To prevent the soil from freezing prior to the early March installation, the site was covered with frost blankets the previous fall. Key to the installation success was daily clearing of all dirt piles to prevent overnight freezing.

Conclusion

Remote locations and site restrictions are ideal for using ATU treatment systems. The flexibility and ease of use make these systems an integral part of the wastewater infrastructure. When an ATU is designed properly, and installed and operated correctly, it will provide outstanding treatment for years to come.

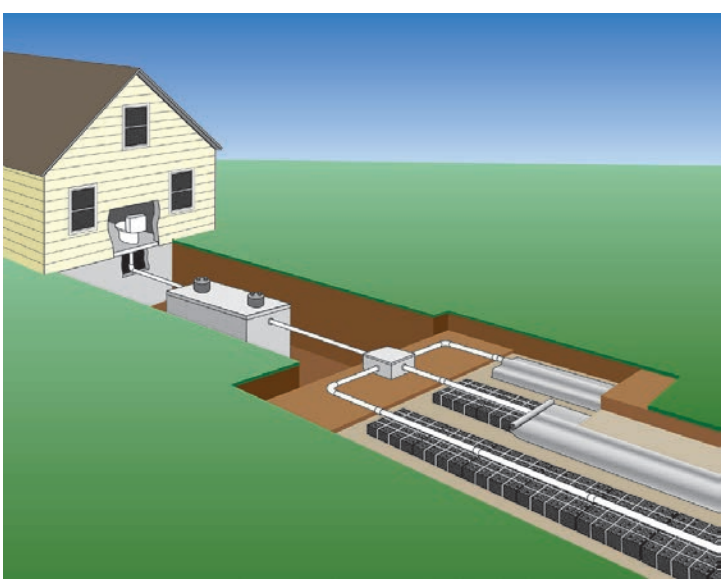
A Treatment Option for Complicated Sites



The Geotextile Sand Filter, GSF for short, is distributed from Australia to Europe, with greater use in the United States. Since the first installations, this product is versatile and proven. It is 100% passive in gravity dosed designs. However, more complicated sites employ a pump for pump to gravity and pressure dosed configurations.

Designers enjoy the high flexibility of the system. Capable of use in trenches, beds and mounds, there is a system configuration that fits whether you find yourself on a sloping site or a site with a high water table.

The GSF system is your tight lot, high water table and poor soil solution. Due to its flexible design, tight repair lots become dream lots, high water tables become gentle sloping lots and poor soils are just another soil. The system excels in intermittent-use sites like campgrounds and seasonal homes, as there are no startup procedures needed. Third-party testing shows treatment begins on day one.



The GSF's unique design provides treatment and dispersal in the same footprint, while keeping installations easy and maintenance minimal. Open air channels within each module support aerobic bacterial growth on the module's geotextile fabric, which provides increased surface area for biological treatment that greatly exceeds the module's footprint. The secondary treatment zone supports unsaturated flow into the soil and works to minimize clogging from anaerobic bacteria. It also protects the soil from compaction and helps maintain cracks and crevices in the soil, preserving the soil's natural infiltration capacity, which is especially important in fine textured soils where these channels are critical for long term performance.

Eljen provides product training year round, in classrooms, onsite on the job site or virtually. Call or visit the website to set up a training that fits your schedule.

Good things come in square packages!

…Good things like more surface area for aerobic bacteria to grow. The Eljen GSF's unique design provides a surprising amount of geotextile fabric in a square package to provide low maintenance treatment.

Now that's a gift that keeps on giving!

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Homeowners Benefit From Durable Tanks Paired With Advanced Filtration

Driving through Heritage Lake Estates in Puslinch, Ontario, it's hard to imagine it previously was home to a steady stream of heavy equipment and dump trucks. Today, well-manicured lawns and homes torn straight from the pages of magazines dot the shoreline and area surrounding a lake that – not that long ago – was a quarry.

Part of this new housing development is the infrastructure build out needed to supply water and power and to treat waste. These components must be designed to meet the demands of future homeowners, as well as the needs of the land, while complying with all applicable codes.

Each home in the development is privately serviced for wastewater treatment. With homes maximizing the 20% allowable building coverage area per lot, each lot's disposal area is limited. A professional land surveying and engineering company takes the architectural house plans and sites them on the properties to ensure that they comply with the zoning requirements and to determine the drainage characteristics of the soil.

A hydrogeological study for Heritage Lakes set the target effluent nitrate concentration at 14 mg/L. Most systems typically achieve a 30-50% nitrate reduction. In this development, however, the engineering team determined that each system needed to reduce the effluent nitrate concentration by 65%.

The soils in the Heritage Lakes development vary greatly, as well, ranging from native gravel that allows for a small filter bed to much less permeable native soil that requires an area bed or a shallow buried trench bed. As a result, each lot's dispersal system is unique.

Fortunately, precast concrete treatment systems may be custom engineered to meet all codes, standards and unique site conditions. Each home's onsite system consists of a series of three precast tanks. To save space on site, the precast concrete manufacturer reduced the tank's standard footprint by 40%. Being able to produce unique tanks for the job, while providing durable, resilient structures to house the advanced treatment components, were key factors for the job.

Inside the first tank is an advanced treatment system featuring an anaerobic digester with a long tube that runs from the inlet to the outlet back to the inlet. Next, the effluent is transferred to a basket tank, which contains foam cubes that harbor microorganisms. The wastewater is pumped from the digester tank and is sprayed onto the foam cubes. The pump in the basket tank transfers the effluent to the last tank for denitrification and discharges the wastewater to the disposal bed.

By using precast concrete tanks in combination with the advanced treatment system, homeowners can rest easy knowing that their systems meet local requirements, protect soil and groundwater, and stand the test of time thanks to precast concrete's durability and resilience.

NPCA
National Precast Concrete Association

The National Precast Concrete Association has represented manufacturers of industrial plant-produced precast concrete products and the suppliers of products and services for the industry since 1965. It is dedicated to expanding the use of quality precast concrete and providing members with the programs and information required to operate a successful precast plant. NPCA represents 950 member companies in 12 countries, all 50 states and eight Canadian provinces, and provides the industry's largest and most comprehensive plant certification program.

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On Par with Precast

Golf Course Chooses Precast for New Treatment System

Photos courtesy of Unit Precast

Challenge: When it came time to upgrade the septic system at a Canadian golf course, ownership needed to replace it during a short construction window following the end of play for the season but before the frigid Canadian winter started. Crews had to work within a small footprint to avoid disturbing the surrounding greens and a nearby lake.

Solution: The contractor chose a precast concrete solution that was designed to treat nearly 8,500 gallons of wastewater per day. The system features eight tanks, which were manufactured in sections to make delivery and installation easier for the contractor. The project was finished in just more than a month, thanks to precast concrete's local availability and hassle-free installation.

Find local precasters at **precast.org/find**

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PRECAST PROUD

NPCA
National Precast Concrete Association

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.

Affordable and Available Now: Precast tanks are available NOW in all 50 states with no waiting or backlog, at prices often more affordable than alternatives. Precast tanks provide value and peace of mind.

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.

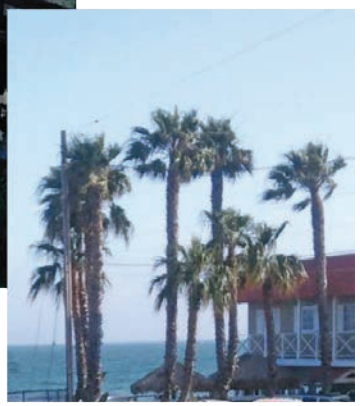
Salcor 3G UV Disinfection Solves Duke's Oceanfront Restaurant Wastewater Problem, Enabling Direct Discharge Into Beach Sand

Duke's – a popular restaurant in Malibu, California – was named after Duke Kahanamoku, who is considered the "Father of Surfing." Wastewater from the restaurant averages 6,000 gpd and must be treated on site and directly discharged into a sensitive beach environment.

After numerous water quality and discharge violations, the facility began upgrading its treatment system in 2011, selecting an upflow sludge blanket filtration system and Salcor disinfection consisting of four 3G units in two parallel tracks. The design was approved by the California Regional Water Quality Board and city of Malibu, and construction was completed in April 2012.

4 SALCOR "3G" UV Units

DUKE'S RESTAURANT, Ocean Front, Malibu, CA Named for Duke Kahanamoku, the "Father of Surfing"



"3G" UV Disinfected Effluent Discharges into Beach Sand

Outstanding results

The new treatment system for Duke's immediately produced high-quality effluent, which has met the stringent disinfection requirement of California Title 22. Results have been consistent over six years of operation, according to the plant operator.

Effluent total coliform count has been nondetectable, and DO concentration has averaged 6 mg/L. The high-quality discharge has reduced coliform levels in the groundwater lens under the site and adjacent beach from greater than 1,600 MPN to less than 2 MPN.

Because of the restaurant wastewater's fat, oil and grease content, the Salcor UV units were initially inspected weekly for possible fouling of the unique Teflon barrier. No fouling occurred, and operation has been trouble-free and efficient, according to the plant operator.

About the unit

Salcor's unit is UL listed and meets the NEMA 6P successful 30-day underwater test. It survives most catastrophic weather disasters (hurricanes, floods and lightning). It has been tested extensively by several third-party testing sites, including 21 separate times by NSF. It has been used in residential, commercial and municipal projects, and can be clustered to treat up to 100,000-plus gpd.

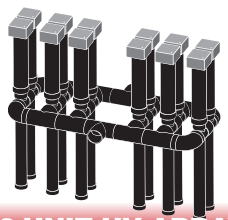
Because its lamp has a Teflon cover, it resists fouling and reduces maintenance, which is limited to simply wiping it down every six months and replacing the lamp every two years. The unit can be installed in-ground or in a pump tank, so the footprint is minimal and includes an alarm circuit for reliable, continuous performance monitoring.

TRUSTED WORLDWIDE UV LEADER

SINCE 1997, "3G" UV UNITS HAVE DISINFECTED ONSITE WASTEWATER GLOBALLY!

SALCOR
"3G" UV UNIT
9,000 GPD
GRAVITY FLOW

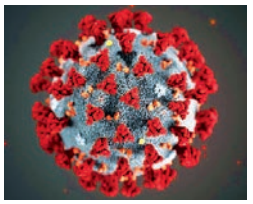
MODULAR BLOCK DESIGN



12 UNIT UV ARRAY
"3G'S" IN PARALLEL/
SERIES ARRAYS
TO 100,000+ GPD

WITHSTANDS A 30-DAY UNDERWATER UL TEST
ENABLES DISINFECTED WASTEWATER REUSE
DESTROYS DEADLY "SUPERBUGS"/VIRUSES
LOW COST • EASY INSTALL AND O&M

DUKE'S OCEANFRONT RESTAURANT, Malibu, CA
4 UV Unit Array
Effluent Discharges into Ocean Beach Sand



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Wide Selection of Onsite Treatment Options Available

Norweco is passionate about its products, committed to its customers and focused on the future. Its vision for innovation and strategic growth is reflected in its superior treatment options and its new building addition.

This summer Norweco completed a 105,000-square-foot expansion which more than doubled its current space, totaling over 180,000 square feet. This very special project is an investment in its customers, the onsite industry and the future.

Norweco is recognized around the world for providing today's answer for the protection of tomorrow's environment. With its talented team of engineers, scientists and distributors, teh company cultivates the critical skills necessary to perfect forward-thinking treatment solutions.

Norweco's legacy represents a longstanding tradition of ingenuity. Its innovative systems and products provide the complete solution for engineers, designers, installers and regulatory officials. The company's partners trust it to provide superior treatment options to meet their application needs both now and in the years ahead. Norweco developed patented and certified advanced wastewater treatment technologies to provide a complete solution to the strictest environmental regulations. The company's broad selection includes:

- Nitrogen treatment
- Phosphorus removal
- Water reuse
- Solar technology
- UV disinfection
- Chemical treatment products

The Hydro-Kinetic wastewater treatment system uses extended aeration and incorporates both suspended and attached growth processes to treat wastewater. The patented Hydro-Kinetic Bio-Film Reactor provides final treatment of the wastewater to a near pristine state. The Hydro-Kinetic system exceeds regulatory standards and is certified and listed to NSF and BNQ Standards CAN/BNQ 3680-600 and NQ 3680-910.

The Singulair Model TNT (total nitrogen treatment) system biologically oxidizes nitrogen compounds without requiring complicated and expensive equipment. The TNT system does not require the addition of chemicals or the recirculation of effluent.

The Phos-4-Fade phosphorus removal filter is a simple gravity flow device that reduces effluent phosphorus to well below regulatory limits.

The Singulair R3 system features innovative water reuse treatment technology that reduces water consumption, reuses treated effluent and recycles water to conserve and recharge our water resources.

The Singulair Solar system delivers an environmentally friendly solution for onsite wastewater treatment by utilizing renewable solar energy to generate electricity.

The Model AT 1500 UV disinfection system is highly engineered and constructed to provide reliable disinfection and superior operational life.

Norweco manufactures a wide range of chemical products for the treatment of water and wastewater. Whether you are a homeowner needing chlorine for a residential wastewater system, an engineer in need of dosage equipment for a municipal project, or a city struggling to lower phosphorus levels, Norweco has the solution for you.

Benefits include:

Certified performance: Tested and certified to the highest standards.

Superior results: Performance exceeds the effluent requirements of NSF/ANSI Standards 40, 245 and 350.

Ease of installation and maintenance: Norweco systems are designed to be easily installed and maintained.

Industry leading manufacturer's warranty: Norweco products are backed by a comprehensive warranty against defects in materials and workmanship.

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Norweco is dedicated to product innovation, customer support and industry growth. Performance certified products include nitrogen treatment, phosphorus removal, water reuse, solar technology, UV disinfection and chemical products.

800.667.9326
www.norweco.com
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ONSITE INNOVATIONS

Advanced Enviro-Septic Solves New Residential Construction Space and Treatment Challenges

The first Advanced Enviro-Septic combined treatment and dispersal system permitted and installed in Lapeer County, Michigan, solved space and wastewater treatment challenges for the builders of a three-bedroom home on a sloping site. The 450 gpd system also left the maximum possible land available for the owner's horses and provided a learning opportunity for the contractor and area health officials.

Area considerations

Local county or district health departments in Lapeer County determine wastewater treatment system sizing, and systems typically utilize large above-grade mounds which compromise the use of available land and require large amounts of sand fill. The aesthetically pleasing AES system blends in naturally with the site grading, eliminating the large hump associated with traditional above-grade systems. Highly purified wastewater is released to the soil, recharging the groundwater, preventing soil and groundwater contamination.

System design

The treatment capabilities of the AES combined treatment and dispersal system resulted in the Lapeer County system being permitted at only 25% of a standard mound system typical for a three-bedroom size home. The 1,500-square-foot AES system features three 70-foot rows of AES installed on top of 2NS sand at 24 inches on center and 6 inches of sand beneath the conduits, which are backfilled to 3 inches above the pipe. A downslope side sand extension creates a basal area large enough to hydraulically accept the treated effluent. The contractor was able to install the AES system in one day without hauling in large quantities of sand and the owner benefited by significant cost savings over other solutions.

Presby Environmental, Inc.

Presby Environmental is an Infiltrator Water Technologies company. Infiltrator is a leading manufacturer of products for the decentralized water and wastewater industries.

800-473-5298 | info@presbyco.com
www.infiltratorwater.com

ONSITE INNOVATIONS

ClickTight Simplifies Onsite System Wiring

There's a better way to wire an onsite wastewater system. The ClickTight Wiring Connection System from Orenco connects a control panel, pump and up to four float switches with simple, quick-connect plugs. ClickTight can save hours of installation time by eliminating splice boxes and wire nuts, plus cut down on callbacks through the use of color-coded wires and terminals that help prevent common wiring errors.

Secure plugs connect float switch cables and a pump to ClickTight, allowing them to be replaced in one easy click. With ClickTight, techs can troubleshoot pump and float issues in minutes. And with a pump adapter, they can attach a wide variety of pumps. ClickTight also connects to a broad range of control panels, and Orenco includes 60 feet of direct-bury cable to help with that. Plus, ClickTight is potted and sealed to help prevent moisture and corrosive gas from reaching the control panel.

For a complete, integrated way to make fast, accurate, secure wiring connections with ClickTight, use the ClickTight Controls Package, which includes the ClickTight, control panel, up to four float switches and an optional pump adapter plug.

Orenco designs and builds decentralized wastewater systems with pride in Southern Oregon. Their products help protect people, neighborhoods and communities everywhere by protecting the world's water. Founded in 1981, Orenco has become an industry leader, with about 400 employees and some 330 points of distribution in North and Central America, Australasia, Europe and Africa. Their systems have been installed in more than 70 countries around the world.

800-348-9843 | info@orenco.com | www.orenco.com

Effluent Pumps Available in Multiple Horsepower Sizes

Heavy-duty effluent pumps from Ashland Pump are available in multiple horsepower sizes for various performance requirements, and feature efficient permanent split-capacitor motors. The oil-filled pumps have an upper and lower ball-bearing design and handle solids up to 3/4 of an inch. They are made of heavy cast iron with cast-iron impellers and are equipped with a piggyback switch (20-foot standard cord) or in manual configurations. They are offered in 3/10, 4/10, 1/2, 3/4, 1 and 1 1/2 hp models.

Ashland PUMP

Ashland Pump is located in Ashland, Ohio, and manufactures a complete line of pump products for the residential wholesale market. Ashland Pump is a family-owned business with over 35 years' experience manufacturing pumps. The company stocks thousands of pumps in its 130,000-square-foot warehouse to ensure there's inventory on hand for customers. The company is thoroughly committed to supporting the professional marketplace with its effluent pumps, along with sump, sewage and grinder pumps for the residential market.

855-281-6830
customerservice@ashlandpump.com
www.ashlandpump.com

Commercial Solutions and Assistance to Solve Increasingly Difficult Challenges

Anua is proud to manufacture and assemble its solutions in the United States. Its decentralized wastewater treatment and odor control technologies are used in commercial, residential, industrial and municipal applications. The company's prefabricated "building blocks" approach is unique to the industry and provides ultimate flexibility in meeting today's challenging project or stringent environmental quality requirements. These challenges are opportunities for Anua to work closely with you to create solutions tailored to the specific need, saving time and money.

Anua's expert team will guide you through every step of the process from design and engineering, to regulatory and installation assistance. Its technologies are designed to excel in a wide variety of situations. They serve the following applications and more!

- Commercial or residential housing developments
- Grocery stores, C-stores and restaurants
- Campgrounds and RV parks
- Hotels and hospitality
- Travel and truck stops
- Schools and day care facilities
- Assisted living or nursing homes

ANUA

Anua is an American manufacturer of Clean Water and Clean Air solutions serving the wastewater and odor control industries. Through the symbiosis of technology, design and collaboration, the company strives to be an industry leader in championing a sustainable future for all.

336-547-9338
info@anuainternational.com
www.anuainternational.com

Anua Addresses Supply Chain Woes Head On

Supply chain and shipping constraints have put the pinch on every business and every industry during the COVID-19 era. For some time, Anua has been proactively engaged in aggressively managing both issues. The company's "building blocks" approach to technology also allows it the flexibility to match raw components with finished goods. So whether it's as simple as a PVC fitting or a more complex control panel, Anua has multiple options and multiple suppliers to hedge against disruption. This ensures that you, the customer, will continue to have a smooth ordering and fulfillment process without delays.

Here's a snapshot of some of the steps Anua has taken to offset the woes:

- Hired a new plant manager with a stellar background in manufacturing and material science
- Hired additional operations staff
- Ramped up procurement
- Opened a new warehouse
- Sourced new raw material suppliers
- Implemented new ERP system for supply chain and manufacturing management

The company currently has full packages in stock and ready to ship. If supply chain issues have you down, contact Anua today for a free consultation to see how Anua can help you!

ANUA

Anua is an American manufacturer of Clean Water and Clean Air solutions serving the wastewater and odor control industries. Through the symbiosis of technology, design and collaboration, the company strives to be an industry leader in championing a sustainable future for all.

336-547-9338 | info@anuainternational.com | www.anuainternational.com

Keep Customers' Septic Tanks Secure and Safe with Seal-R Septic Products

Seal-R products from BrenLin Co. are designed to be installed as part of the inspection/maintenance opening to sewer tanks. These products were developed by experienced onsite installers who strove for a product that was not only simple to install, but also provided flexibility and safety.

The products were designed using corrugated dual-wall pipe for the riser material due to the benefits of limited joints and the ability to cut to the exact length in the field. Made from HDPE, Seal-R products offer both durability and longevity. The Seal-R septic ring is designed to attach the riser to the septic tank while creating a watertight seal to prevent infiltration.

The Seal-R septic lid is designed to be mounted on top of the riser at ground surface to provide an access point to the septic tank. Lids are green in color and are provided with the stainless steel hardware needed to securely fasten to the riser pipe. Lids can be customized to include company information.

Seal-R products also come with a few add-on options, including a hinge system as well as lids that can be installed on the inside of the riser for additional safety.

BrenLin COMPANY, INC.

BrenLin Co. Inc. is a family owned and operated manufacturing business established in 1998. Specializing in heavy-duty plastic septic system products, the company designs all products in house and manufactures them in the USA.

888-606-1998 | brenlin@frontiernet.net | www.seal-r.com

Installer Friendly Series Makes Programming and monitoring easy

Newly redesigned IFS panels make programming and system monitoring a breeze. They feature a new color LCD interface on the inner door. With this interface, the panel configuration can easily be converted in the field to either timed dose or demand dose.

Other interface features include touch-safe housing, Pump Hand/Off/Auto Control selectable via menu navigation, tank level indication and setpoint monitoring at a glance, display with remaining time in each active on or off timed dose mode, and RJ45 communication connector for future expansion.

IFS Single Phase Panels are available in both simplex and duplex models. The simplex is designed to control one 120/208/240-volt pump, while the duplex controls two 120/208/240-volt single-phase pumps.

Both panels are housed in 12-by-10-by-6-inch NEMA 4X ultraviolet-stabilized thermoplastic enclosures that are padlockable and include integral mounting flanges, drip shield, heavy-duty cover latches and stainless steel quarter-turn set screw.

Need flexibility when it comes to level monitoring? No problem. These panels can be changed in the field to use either floats or the C-level sensor for continuous level monitoring.

For easy float replacement, these panels can be ordered with the EZ Connex float connection system; it makes replacing floats a snap, with quick release connectors and other labor-saving features. IFS Single Phase Panels are cUL Listed and covered by SJE Rhombus' 5-year limited warranty.

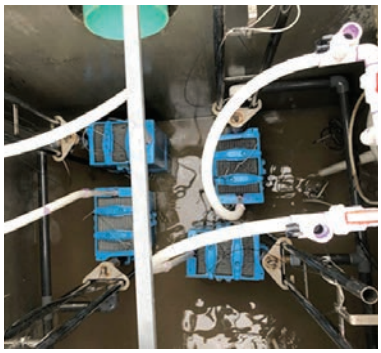
SJE RHOMBUS

SJE Rhombus is a leading manufacturer of liquid level control products including panels, alarms, floats and accessories. They have been servicing the water and wastewater industries since 1975. SJE Rhombus is a brand of SJE, a privately held company with corporate headquarters located in Detroit Lakes, Minnesota. SJE does business globally from multiple locations across the U.S. and Asia.

218-847-1317 | info@sjeinc.com | www.sjerhombus.com

Affordable Housing with Stringent Water Requirements

Location: Westport (Noquochoke Village), Massachusetts
Project Size: 12,000 gpd
Facility Size: 50 homes and community amenities



The Boston-based developer of the Noquochoke Village affordable housing project had an uphill battle with proposing affordable housing in Westport, Massachusetts. Allen & Major Associates — working with the design engineer along with J&R Sales & Service (BioMicrobics' Massachusetts distributor) and Wastewater Treatment Services (the installer) — began working to design a decentralized, community-based, aerated membrane bioreactor system in the summer of 2018, and the system was installed and started up in May of 2019.

"In evaluating system design alternatives and service vendors, we were pleased to coordinate with J&R Sales and Service, who brought a wealth of knowledge to the design team on how a BioMicrobics [BioBarrier MBR] system can meet the demands, be adjusted based on varying field conditions, and be reliably maintained," says Phil Cordeiro of Allen & Major Associates.

Installed below the parking lot in locally sourced tanks, the BioBarrier HSMBR system also met water quality requirements for the reduction of chemical and microbiological contaminants and established the material, design, construction and performance requirements for other onsite residential and commercial applications. It consisted of a 10,000-gallon flow equalization tank; followed by a 20,000-gallon settling tank with BioMicrobics SaniTEE effluent screens; two three-compartment 8,000-gallon tanks with BioBarrier HSMBR 6.0-N each with two compartments creating anoxic zones; 3,500-gallon pump chamber; alkalinity feed system, installed but currently not needed, as the MicroC is available as a carbon source; and drip tubing for dispersal.

"We think the most interesting part of this project is that the local regulators were looking for "net zero" nitrogen at the property line and with the BioBarrier treatment train, we were able to achieve a 98% TN removal. The BioBarrier system was selected for this site to meet a local TN requirement of <5 mg/L TN. The system has consistently met this requirement," says Cordeiro.

ONSITE INNOVATIONS

Replacing an Overboard Discharge on a Microscopic Site

Problem: Matt Page, LSE, of Maine Septic Solution was charged with squeezing an onsite treatment system onto a tight difficult site, while ensuring seamless functionality and preserving the aesthetic of a remarkable ocean property on the Maine coast. The lot was 7,000 square feet, with 34 feet to the owner's well, and 53 feet to the neighbor's well. The system needed to fit in a footprint of 10 by 28 feet.

Answer: The Fuji Clean Model CEN7 (design capacity 700 gpd) answered the call. It offers one-tank treatment with a tiny footprint and low profile (99 by 57 by 73 inches). At-grade access ports do not hinder the world-class view. Its whisper-quiet blower (<50 dB) is in sync with serene surroundings, while the lightweight tank (705 pounds) was easy to maneuver into location. One simple 3/4-inch airline hookup minimizes excavation requirements.

FujiClean USA Toward Clean Water

Fuji Clean USA is a wholly owned subsidiary of Fuji Clean Co., Ltd. headquartered in Nagoya, Japan; a leading manufacturer of onsite treatment systems. Fuji Clean USA offers a selection of one-tank treatment systems for both residential and commercial applications ranging in size from 500 up to 6,000 gpd, including its high-performing CEN denitrification models.
207-406-2927 | info@fujicleanusa.com | www.fujicleanusa.com

ONSITE INNOVATIONS

Flat Bed a Fit for Bedrock-Covered Site

Waterloo Biofilter was approached with a water access project with significant bedrock coverage. As reduction in dispersal bed size was most important, advanced wastewater treatment was a requirement. Durable, lightweight Flat Bed treatment units were the perfect choice for the site. These units are modular and can be installed in parallel or series. Additional units can be added to increase the overall treatment capacity. Wastewater is dosed via a low-voltage pump to the Flat Beds where treatment occurs. Treated effluent moves to a disposal bed below by gravity. Flat Beds are installed flush to grade and landscaped into the property with the supplied mulch. No distribution piping is required in the disposal bed resulting in a smaller system footprint and faster installation. With their low profile, Flat Beds can be installed in areas of high groundwater or bedrock without destroying the aesthetics of the property.

Waterloo BIOFILTER

Waterloo Biofilter Systems is a Canadian-owned and -operated company that develops, designs, manufactures and maintains advanced onsite wastewater treatment systems. We are committed to high-quality treatment, low electricity usage and system robustness.
866-366-4329 | sales@waterloo-biofilter.com
www.waterloo-biofilter.com

SYSTEM PROFILE

The Trans-Canada Highway, background, limited what could be done on the Bayside Travel Centre site in Afton Station, Nova Scotia. The shed holds control panels and blowers for the system — its TUF-TITE lids are visible at middle right. (Photos courtesy Anua and Hatch Ltd.)

Building Plan Changes Throw a Wrench Into Nova Scotia Project

A last-minute bump in the size, scope and wastewater treatment needs challenge the designer and installers of a Canadian travel center

By David Steinkraus

For a long time, the small triangular property near Afton Station in northeastern Nova Scotia couldn't be developed. The Trans-Canada Highway runs across this community land of the tribal Paqtnkek Mi'kmaw Nation, and the controlled-access highway divided the southern triangular parcel from the large northern property where the Paqtnkek Mi'kmaw have a health center and other buildings.

Then, in 2018, the Nova Scotia Department of Transportation and Infrastructure built a new interchange that included a bridge over the highway to connect the north and south community lands, says Matt Delorme, a professional engineer with Hatch Ltd. in Halifax. As its first economic development effort on the newly available southern parcel, the Paqtnkek Mi'kmaw built a travel center with two restaurants and plenty of room for trucks and other vehicles. Delorme designed the wastewater system, which had to be done in March 2020.

The system

Wastewater from the bathrooms and the restaurants exits the building in 8-inch pipes. Because of the BOD in restaurant wastewater, the two streams are initially separate.

Wastewater from the bathrooms flows into a 3,500-gallon concrete settling tank. Tanks, plus TUF-TITE lids and risers, came from Brookfield Concrete in Brookfield, Nova Scotia.

Restaurant wastewater flows through a Proceptor SV 3000 oil-grease separator from Zurn Industries, and then makes a 90-degree turn to join the wastewater stream flowing into the primary settling tank.

Next, wastewater flows into a 4,500-gallon equalization tank with two pumps from EBARA Corp. that dose a pair of 2,000-gallon tanks connected in parallel as aeration chambers. Each aeration chamber contains three PuraACE high-strength pretreatment pods from Anua.

Winter construction in Nova Scotia means temperatures of minus 13 degrees Fahrenheit (minus 25 Celsius). Insulated tarps and heaters kept the work going.

Construction of the Bayside Travel Centre in Nova Scotia took place during winter. Installers from Francis J. Boyle Construction used a pair of Caterpillar excavators to complete the project.

System Profile

Location:	Afton Station, Nova Scotia, Canada
Facility served:	Bayside Travel Centre
Designer:	Matt Delorme, Hatch Ltd.
Installer:	Francis J. Boyle Construction, Afton Station
Type of system:	Anua PuraACE and AeroCell
Site conditions:	Silty sand
Hydraulic capacity:	6,500 gpd

Flows recombine and move by gravity to a 2,000-gallon clarifier tank. Sludge is continually pumped from the clarifier and returned to the upstream primary settling tanks for additional treatment.

That's what is neat about this system, Delorme says: It's like a municipal wastewater treatment plant scaled down.

From the clarifier, effluent moves to a pair of 3,000-gallon dosing tanks. The first has two STEP 50 pumps from Sta-Rite (Pentair). Pumps alternately dose five of the 10 Anua AeroCell IM1530 pods in the system. The second dosing tank receives 80% of pod effluent for further treatment. The remaining 20% of effluent discharges through an Anua Puralinity passive pH buffer basin to a drainfield made with about 490 feet of 4-inch perforated pipe. Piping is divided into five laterals bedded on crushed stone.

Technicians used a pair of Cat excavators, a 320 and 315, to do the job along with a Cat 930 loader and a pair of Cat 300 rock trucks, says Brent Boyle, project manager for installer Francis J. Boyle Construction of Afton Station.

The job went smoothly given that construction was done in January and February, he says.

"We were cold. We were minus 25 Celsius," Boyle says. That's minus 13 Fahrenheit. Insulated tarps and heaters kept the job moving, Boyle says. "We're used to that kind of weather."

Challenges

Waste strength was a concern from the beginning, Delorme says. During the design phase, restaurant tenants hadn't been selected, so it was unclear just how strong influent would be.

The two restaurants that eventually contracted for space were a fried chicken shop named Mary Brown's Chicken, and a branch of Tim Hortons, a chain of stores selling coffee, tea, baked goods and other quick-serve foods.

"Right from the outset we knew Tim Hortons was potentially on board, and they have a substantial engineering department, so we were looking at their typical waste streams when considering the system. They also have a decent grease separator and food trap within their facility, as does the other restaurant," Delorme says.

But tenants can change as time passes, and sometimes people don't maintain systems well, he says. That's why the design splits the waste stream and uses the Proceptor separator, which can be maintained independently by the travel center owner.

Another concern was the chemicals used in restaurant dishwashing and cleaning. Delorme wanted to minimize "quats," the quaternary ammonium compounds that can be toxic to microbes in wastewater systems. That will be addressed with tests to measure quat concentration and, if needed, conversations with the restaurants about their processes.

Plans change

"Our original plan was to go with a conventional onsite system," Delorme says.

It would have used a large sand filter for final treatment. Then the project changed. Initially the travel center was to have been 9,500 square feet with a single drive-thru restaurant and a large lot for trucks and other vehicles. As design continued, the building expanded to 16,000 square feet, and a second drive-thru restaurant was added. A wetland on the north side of the property, and the parcel's triangular shape, limited siting options for the sand filter.

"With the building changes, we ended up halfway through the project saying, 'No, no, we don't have room anymore for our initial plan,'" he says.

As the projected cost of the system escalated, he says, engineers thought about directionally drilling under the Trans-Canada Highway and connecting to the municipal wastewater system serving the clinic and other buildings. But that plant was sized for future needs and had no spare capacity.

That led to the current system. Because treatment is largely handled

Workers from Fancis J. Boyle Construction prepare a tank for the Bayside Travel Centre in Afton Station, Nova Scotia.

A redesign of the Bayside Travel Centre system simplified siting components. Because treatment was largely done in tanks, those could be sited more easily. This settling tank, for example, is on a slope across the road from the travel center building.

"With the building changes, we ended up halfway through the project saying, 'No, no, we don't have room anymore for our initial plan,' **... Our original plan was to go with a conventional onsite system."**

Matt Delorme

with enclosed components, those could be sited on sloping parts of the site, Delorme says. And because effluent is so clean, he says, there is no biomat formation in the drainfield, infiltration rates are higher and the drainfield can be smaller.

"Our target is 30 mg/L on the BOD, and my last test said it was running at 7," he says. Influent BOD is between 250 and 500 mg/L, but the system is designed to treat higher flow rates and BODs expected when the second restaurant comes online soon.

At one point, the design team worried that the radical shift in treatment technology would delay the spring opening of the business, Delorme says. But local Anua distributor Sansom Equipment, plus Anua itself, Brookfield Concrete, and installer Brent Boyle — went above and beyond, Delorme says.

"Especially the Sansom guys — I was talking to them before Christmas break, and we were putting designs together over Christmas break to meet manufacturing deadlines," he says.

From government approval of the revised system to commissioning of the installed system was three months, he says. "From past projects, I literally thought this was impossible to meet."

For the Bayside Travel Centre, this team delivered the impossible.

featured products

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(See ads on pages 32, 33)

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

Delaware County Clamps Down on Onsite Developments

By David Steinkraus

After a couple of years of flirting with the issue, the New Castle County Council in Delaware imposed a permanent moratorium for large developments built with septic systems.

The vote came on Aug. 31, after several hours of public comments and debate, reported Delaware Public Media. New Castle County covers the northern Delaware, including the city of Wilmington and the western shore of the Delaware River.

Mostly affected is the rapidly growing and rural southern portion of the county. The moratorium forbids the development of more than five parcels on the same septic system.

Advocates of the ban cited the risk to water quality from onsite systems, and County Executive Matt Meyer has promoted the ban as part of what he calls his environmentally friendly Green Agenda. Opponents cited the risk to farmland value and the loss of potential retirement income for farmers.

Originally, the moratorium was supposed to be temporary so county planners have time to develop a master plan for that section of the county. In January 2020, the council extended the moratorium for 18 months after pressure from farmers prevented a permanent ban on septic systems. A nonprofit that promotes responsible economic policy also praised the delay because it would give people time to think about the issue.

The population in southern New Castle County is projected to increase by more than 8,000 people by 2050, says an advocacy sheet produced by the county government.

However, noted the *Delaware Business Times*, there is no timeline for providing sewer infrastructure to serve people in the area. Without that, developers turned to proposals for subdivisions that would rely on onsite systems.

Massachusetts

A Falmouth committee is looking at requiring a 300-foot buffer zone around water bodies in which advanced treatment units would be required.

Nitrogen is the pollutant of concern to the Falmouth Water Quality Committee and is endangering the health of several ponds in the municipality. Of 12 estuaries, only two could meet total maximum daily load limits using ATUs within 300 feet of the shore, consultant Kristen Rathjen of Science Wares told the committee, according to the *Falmouth Enterprise*. More examination is needed for other water bodies, she said.

* * *

Mashpee will require inspection and pumping of septic systems within 300 feet of Santuit Pond.

About half of the homes near the pond have not had their systems pumped in the last 10 years, Glen Harrington, the town's health agent, told the Board of Selectmen in August. There are 121 systems within that 300-foot border. Excess nitrogen and phosphorus have caused cyanobacteria blooms in the pond, reported the *Cape Cod Times*.

Mashpee and nearby Barnstable have been sued by the Conservation Law Foundation over water pollution. The suit claims the municipalities have known for decades that nutrient pollution was the cause of declining water quality and have violated their own regulations by allowing water quality deterioration to continue.

New York

Federal pandemic funds will be used to double onsite grants to homeowners in Nassau County, said County Executive Laura Curran. State money of $2 million will be matched with another $2 million from the federal American Rescue Plan.

Applicants to replace or repair failing septic systems and cesspools will be eligible for up to $20,000 instead of $10,000, reported Newsday. About 90% of the county, which is on Long Island and abuts New York City, has municipal sewer service, but thousands of homes and small businesses along the county's north shore rely on some type of onsite system.

* * *

Another phase of New York's septic system replacement program is open for residents of Jefferson County. There is no additional money, but more people will be eligible.

Properties on the St. Lawrence River and Guffin Bay on Lake Ontario were added to the program after reports suggested wastewater from failing onsite system was leaking into those bodies of water, reported the *Watertown Daily Times*. The program pays half the cost of replacing failing systems, up to a maximum of $5,000, for properties within 250 feet of the shore.

Michigan

In the department of the more things change, the more they stay the same, we offer this item posted by the *Manistee News Advocate* and taken from its Aug. 12, 1961, edition:

"A large audience of 130 people attended a public meeting of the Onekama village council last night at Farr Center to discuss the pollution of Portage Lake near the village area caused primarily by inefficient outlets of septic tanks. The meeting and large turnout was prompted by the posting of pollution signs at the beach at Village Park on Friday morning due to the high bacteria count of water samples taken there."

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

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-Site Sewage 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

CANADA

ALBERTA

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

MANITOBA

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

PRODUCT SPOTLIGHT

Geoflow drip system aims for even effluent distribution

By Tim Dobbins

Drip irrigation techniques date to the 1860s, but this strategy for dispersing water has come a long way since then, and its range of applications has largely expanded.

For the better part of six decades, Geoflow has been producing drip systems for agricultural use, and over their span of production, they transformed those techniques into subsurface drip systems for onsite wastewater use.

The subsurface drip system is recommended by Geoflow as a way to disperse secondary reclaimed wastewater for commercial, municipal, residential, industrial and agricultural applications. The idea is that because the effluent is spread underground, it is absorbed directly into the biologically active soil layer, eliminating any surface contamination, ponding, runoff issues and foul odors.

"Geoflow's Wasteflow dripline is made specifically for the high biological load we see at many onsite applications," says Karen Ruskin Ferguson, president of Geoflow. "As water is becoming scarcer, the dripline is being used more and more for reuse in the landscape."

The dripline is a half-inch in diameter and made to be buried directly into the soil. The company also concentrated on ensuring uniform flow rates across the entire span of the system. "Each emitter has a tortuous flow path and, in some cases, a rubber diaphragm, to regulate the flow so the rate of flow between the emitter closest to the pump will be the same as the emitter furthest from the pump," Ferguson says. Burying the line also makes the Wasteflow drip system an option for areas with regular freezing conditions with correct design.

According to Geoflow, a large part of the success of the Wasteflow drip system is due to the Geoshield lining inside the pipe walls. "Geoshield is an exceptionally smooth teflon-like bactericide to keep bacteria from sticking and growing inside the dripline," Ferguson says. "We also have a band of ROOTGUARD, a pre-emergent herbicide that maintains sufficient concentration over time to keep roots from growing into the exit holes of the dripline."

Wasteflow can be used on sites with limiting layers, difficult soils, steep slopes and smaller setbacks. "It can be used on marginal lots where other technology is not appropriate, and has really helped in repairs of outdated systems, areas with heavy clay or areas close to water bodies," Ferguson says. "With subsurface drip, secondary reclaimed wastewater can be used, eliminating the ongoing cost of additional effluent treatment." **800-828-3388; www.geoflow.com**

SNAPSHOT

Pump Chamber Setbacks Would Help Preserve Canada's Clean Inland Waters

A member of the Ontario Onsite Wastewater Association promotes a regulation that would protect an important resource

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 Ontario Onsite Wastewater Association.

Danielle Ward
onsite wastewater specialist

Business: Adams Brothers Construction,
Parry Sound, Ontario

Age: 27

Services we offer: We do septic design, installation, inspection and pumping, and provide diagnostic and consultation services.

Years in the industry: 5

Association involvement:

I am a member of the Ontario Onsite Wastewater Association, currently serve on the board of directors and as treasurer.

Benefits of belonging to the association:

Education and training, assisting others in the onsite wastewater industry, and the annual convention, which is a great event.

Our crew includes:

We have several different crews and team members. Each individual is a huge part of our team, from laborers, truck drivers, equipment operators and many more. Without our team we wouldn't be able to accomplish what we do and serve our community.

Typical day on the job:

My day starts with organizing and getting crews going to their job sites. If it's a new site, we go and set everything up to get them started. During the rest of the day, I could be doing septic permits and designs, diagnosing a system with a problem, looking at new building sites or replacement systems, or doing inspections.

The job I'll never forget:

We have dug up and replaced some pretty interesting sewage systems. Back in the day there were some weird things used as septic tanks and buried in the ground — old trash containers, 30-foot steel tanks that looked like torpedoes, and even a Volkswagen Beetle.

My favorite piece of equipment:

That has to be my RIDGID sewer camera. It helps with diagnosing systems and finding problems, it saves a lot of dig time — and it saves the homeowner money.

Most challenging site I've worked on:

We are in a beautiful area with a lot of bedrock. The most challenging sites are mostly bedrock with little native soil and homeowners wanting to put a large building on them. They typically end up with a treatment unit that takes up less room. We have to get creative with design and placement so homeowners can build their dream home and have an aesthetically presentable septic system.

Oops, I wish I could take this one back:

We had a job site where the homeowner's cottage was beside a massive rock cut. A giant boulder about six feet wide broke off the rock cut and landed right on top of the pump chamber and crushed it into the ground. The homeowner had beautiful landscaping and no access to the pump chamber with an excavator by land. We agreed to break the rock with air hammers and remove it. Eventually we craned a 1.8-ton excavator in to install the new chamber. But I don't think any of our guys ever want to use an air hammer again.

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

I've had customers ask why they can't just run a pipe from their sewage line in the house to the lake.

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

I would add a regulation for pump chambers to have some sort of setback to bodies of water. We see so many pumps fail and the pump chamber is so close to a body of water that it overflows and runs into the lake. Having high

level alarms certainly helps to avoid this — however, sometimes it still happens. If a setback can't be met for a building such as a boat house, then the pump chamber should be in a large watertight compartment.

Best piece of small business advice I've heard:

I received advice from a former employer and have always carried it with me — the Golden Rule should be applied not only in life, but in business practices as well. Treat your employees and co-workers the way you would want to be treated. If the Golden Rule is consistently practiced, your employees will be more productive, enthusiastic and loyal. Knowing your employees and co-workers enjoy coming to their job every day makes for a very positive workplace.

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

Hopefully be a full-time firefighter. Currently I am a volunteer. That is the career I would certainly pursue if I wasn't in the wastewater industry.

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

I see the wastewater industry utilizing technology more and systems becoming more advanced. With residential lots getting smaller and buildings getting larger, I see a much higher need for these types of systems and believe that one day conventional systems will be far outnumbered by technology. ☐

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.

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