



Shades Of Grey

With water conservation a growing concern, Greyster's residential recycling solution is poised for prime time.



Greyster Water Systems CEO Mark Sales (second left) with Greyster team.

In recent years, home energy techniques have progressed in leaps and bounds to the point where most experts believe there's only so much more efficiency we can currently squeeze out of a house.

Attention has now shifted to a subset of home energy that, until recently, has not undergone the same kind of advancement – namely, water conservation.

While everyone has been focused on energy efficiency, water efficiency has been bubbling under the surface. And even though it has not been perceived with the same sense of urgency as carbon reduction, water usage is a huge – and growing – concern. The fact that water prices are increasing

an average of 10% to 12% annually in North America further highlights the issue.

That's what makes the technology from Ontario-based Greyster Water Systems Inc. so appealing – particularly in the United States, where water conservation tends to be a larger concern, but also increasingly so here, north of the border.

After many years of development, Greyster reached a huge milestone last March, when the Greyster HOME water reuse solution received certification to the NSF/ANSI 350 standard, which is a rigorous test that establishes material, design, construction and performance requirements for on-site residential and commercial water reuse treatment systems.

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During the six-month test, the Greyter HOME was dosed with a greywater cocktail that included secondary effluent from a wastewater treatment plant. All the while, the system delivered 30 gallons of near-potable water each day and did not require any user maintenance. Greyter is currently the only cost effective, small footprint residential greywater solution that meets the NSF 350 standard for recycling shower and bath water for toilet flushing.

John Bell, Greyter's vice president of business development for residential homes, explains that many U.S. jurisdictions require NSF 350, as it is the emerging water quality standard for residential greywater reuse. Hence, the importance of Greyter's certification: "There is simply no other solution on the market like the Greyter HOME," says Bell. "It is the only practical, cost-effective solution currently certified to NSF 350," he continues.

With water taking centre stage as a valuable resource, many municipalities facing such challenges – and the associated high costs of infrastructure – are working with builders and developers to find innovative solutions to help create water-efficient communities (see issue 12 for more on this dynamic). In fact, in many instances, managing water efficiently is the key to being able to build homes at all – so the Greyter HOME solution is a very welcome product in many regions.

It's also a rather unique product. Greyter's CEO, Mark Sales, says that there is currently no comparable



Co-founder John Bell with the Greyter HOME system.

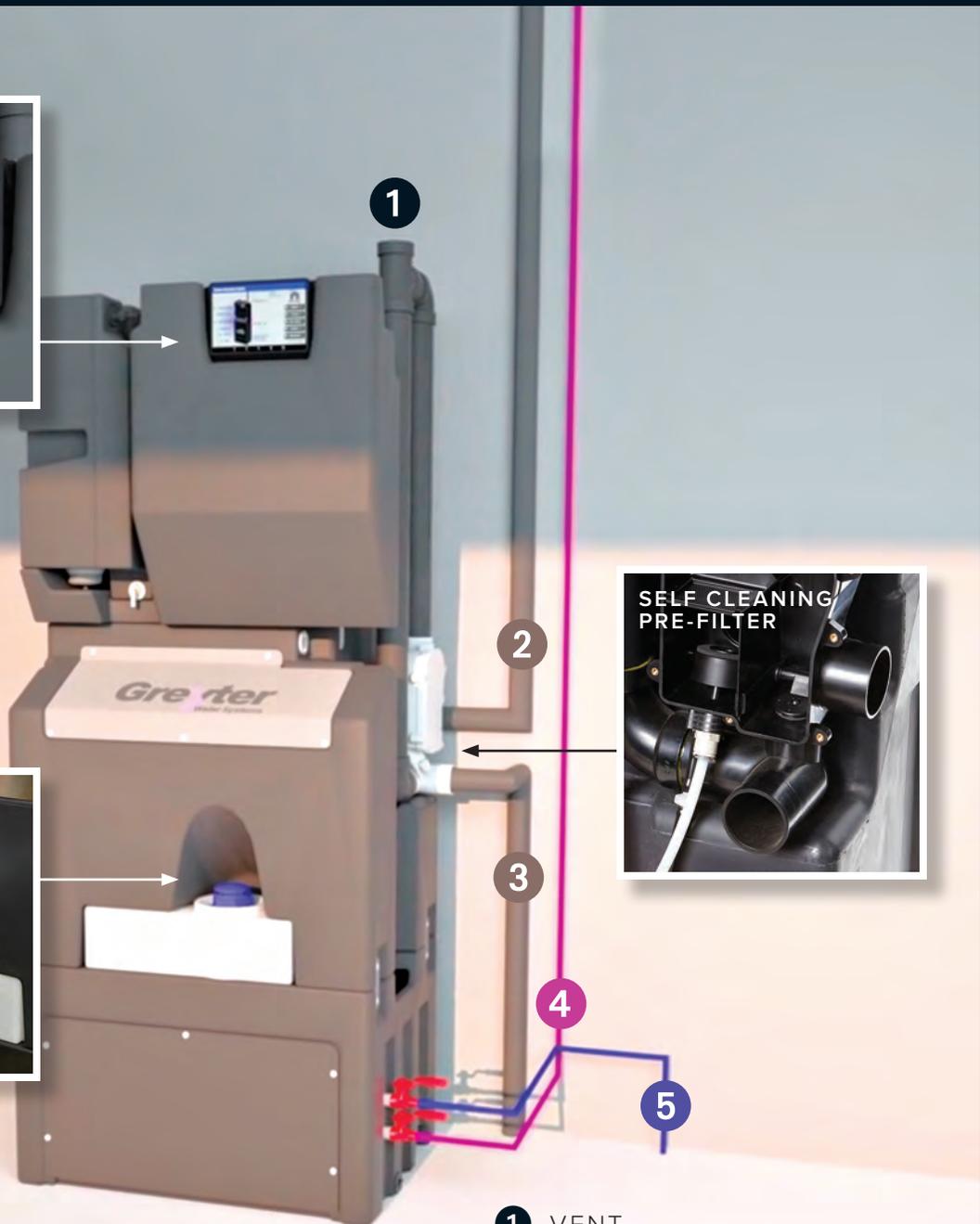
solution in North America. The system uses a non-biological self-cleaning membrane and a self-cleaning pre-filter in order to provide a safe, reliable, high-performing and low-maintenance solution. Many water treatment systems use filters to treat water, which can clog and can require frequent maintenance. Others utilize a biological approach (requiring biomass), which can pose a risk in providing reliable operation.

"We developed the Greyter HOME with the home owner's safety and comfort in mind and so that it was bio-free," says Sales. Not only does the quality of water meet the NSF 350 standard for toilet flushing, but the risk of bacteria passing through is eliminated by the self-cleaning membrane.

In addition to Greyter's proprietary membrane, the company has two patents pending: one to the overall process and a second relating to the company's innovative self-cleaning pre-filter, which remediates large solids and hair before entering the system. Small wonder Greyter's technology is drawing interest from some large players in the industry.

In fact, Greyter and Lennar, one of the leading home builders in the U.S., just recently announced that they have joined forces with the city of Tucson, Arizona's water department to bring the revolutionary residential greywater recycling solution to home owners in Lennar's Santa Rita Ranch and La Estancia communities. This project marks an important milestone in Greyter Water System's efforts to bring the revolutionary residential greywater recycling solution to home owners nationwide, while also providing builders and municipalities with the technology to help create water-efficient communities.

THE GREYTER HOME™ AT A GLANCE



- 1 VENT
- 2 SHOWER/BATH WATER IN
~2 SHOWERS = ~30 FLUSHES
- 3 DRAIN OUT
- 4 GREYWATER TO TOILETS
- 5 FRESH WATER MAKE-UP

For more information and to watch a video about the Greyder HOME greywater recycling system, go to Greyter.com and click on "How it Works"

Greyter's Anatomy

As Greyter sits on the precipice of breaking through, let's retrace the company's steps to get to this stage.

2012 The company launches, starting from scratch, says CEO Mark Sales. Its focus at the time was on-site water reuse solutions for commercial and multi-unit construction, featuring a system much larger than the residential unit currently being rolled out. The goal is to develop a product for single-family home construction.

2013 The company begins R&D relating to what eventually becomes the Greyter HOME product.

2016 The first several field and beta test solutions are installed with the understanding, Sales says, that it would take about two years to optimize (that is, to work out the processing and operation kinks from an automation and energy- and water-efficiency standpoint).

2017 Greyter begins its soft launch of about 30 systems within the Greater Toronto Area. Concurrently, the company sets out to certify to the NSF 350 standard.

2019 March. The latest version is completed as NSF 350 certification is achieved.

2019 Summer. The Lennar pilot in Tucson begins.

2020 Sales indicates that Greyter will move forward with various builders on larger projects.

2022 Greyter's projected major breakout, as per Sales.

Greyter and Lennar, one of the leading home builders in the U.S., just recently announced that they have joined forces with the city of Tucson, Arizona's water department to bring a revolutionary residential greywater recycling solution to home owners.

The pilot project launched in August 2019 and the final Greywater recycling systems were installed in November 2019. A total of nine new Lennar single-family homes received a Greyter HOME solution. This marks the Greyter HOME's first deployment for a large-scale U.S. home builder. And "next year, we'll have an incredible amount of data," Bell says.

In a nutshell, instead of sending shower and bath water directly to the sewer, the Greyter HOME treats it so that it can be used one more time to offset toilet flushing needs. Typically, just two showers a day (approximately 150 litres of water) can meet the demand for toilet flushing for a family of four. This can result in a reduction of water use of approximately 20% to 25%. Less water supplied to the house also means less sanitary outflow to water treatment plants. This can mean reduced costs for municipalities.

Although the Greyter HOME has gone through considerable testing since 2016, that data from the Tucson pilot and larger 2020 projects will allow Greyter to fine-tune its solution even further. Bell says that certain revelations from the pilot have already been adopted within the Greyter HOME to provide for an even more resilient water- and energy-efficient recycling system.

While the U.S. currently remains Greyter's main market, the company is beginning to see more deployment of its technology in Canada. Municipalities further away from water sources, like East Gwillimbury and Tottenham, have already begun to adopt water conservation practices. Bell says Guelph is offering a \$1,000 rebate to home owners who install a greywater recycling system.

An even better example of this is happening in Pickering. As part of John Godden's HERS_{H2O} pilot, a forward-thinking builder in Geranium Homes has combined with Pickering – a municipality that's shown it's serious about sustainability – to create a North American first. This is the first time in Canada that an entire subdivision, 22 homes, will include actual water recycling solutions.

Clearly, Geranium recognized long ago that this was the direction of the future home. "When we first introduced greywater rough-ins at our Copperstone neighbourhood in Ballantrae [in 2013], a residential system wasn't approved for installation in Canada," says president Boaz Feiner.

"However, we knew water conservation was becoming more important to everyone and we



Jim Couperthwaite of Geranium Homes with newly installed Greyster HOME system. Upper right: Typical Model slab on grade design due to high water table. Right: Two-stage furnace with tankless hot water heater for radiant floor and domestic hot water.



committed to providing this rough-in in all our future detached home communities,” he explains.

Installing the Greyster HOME system as a standard feature at Geranium’s Edgewood community “is a progression of our dedication to water conservation,” he says.

As mentioned, Pickering is making sustainability a priority, and Feiner says his company sees eye to eye with that initiative. “Geranium is aligned with Pickering in our desire to offer our home owners – Pickering residents – a way to participate in water conservation.”

Among the other energy-efficient features at Edgewood are:

- Drain water heat recovery unit integrated with the Greyster HOME;
- 96% two-stage furnace with ECM blower;
- Efficient radiant floor heating in ground floor slab-on-grade;

- ENERGY STAR-qualified high-performance windows;
- High-efficiency tankless water heater at UEF –.97;
- Rough-in for future power for electric vehicles;
- R-31 expandable spray foam insulation in garage ceiling and exterior overhangs below living areas;
- R-22 plus 1.5 Excel board in exterior walls and R-60 cellulose insulation in attic above living areas;
- Programmable thermostat;
- Energy recovery ventilator (ERV);
- Water-efficient showerhead and toilet tanks;
- ENERGY STAR-qualified exhaust fans in bathrooms; and
- Third-party ratings, including Better Than Code and HERS_{H2O}.

Bell says Greyster’s current focus is to continue to make inroads in the U.S. while completing the Geranium project.

While Greyster’s technology is currently focused on the builder market, a day may come when consumers will begin to embrace it. Sales says that, with today’s builder mindset coupled with a new generation of home owners who have more of an inclination to energy and water efficiency, he anticipates the Greyster HOME will become standard within the home 10 years down the road.

And that aligns perfectly with his ultimate dream. “My goal since 2012 has been to bring a new appliance into new homes that drastically reduces water consumption so that everyone wins – the municipality, the builder and home owners,” he says. **BB**

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