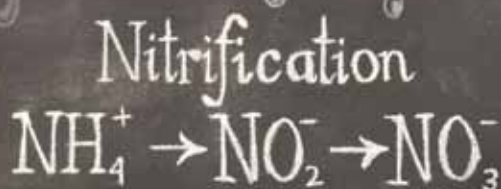


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Embracing Good Ideas

BY KATHERINE BALPATAKY

INNOVATION IN THE WATER SECTOR

has been on my mind lately. With both provincial and federal governments driving the issue forward through policy objectives and funding, the concept of innovation has been central to recent discussions of industry leaders and front line workers. As well, Water Canada hosted the 2016 Canadian Water Summit and Water's Next awards in June, bringing together leaders and champions from industry, government, and non-government sectors to tackle the opportunities and barriers to water innovation—all in recognition that decisions made in the next few years will set our course for decades. There seems to be a consensus that after discussing these issues for many years, we need to reach agreement on how to best implement appropriate solutions. Here's a few ideas that I have gleaned from the conversations:

- Performance-based measures are needed that will allow for flexibility in policy decisions in order to keep up with technological advancements.

- The one-size-fits-all federal approach to regulation can be challenging, as the mechanisms for changing regulations are slow moving (perhaps by necessity); we therefore need to devise ways of moving forward, in spite of these constraints.

- First Nations communities are now a priority for Canadians, and we must fulfill government commitments for improving their water supply in ways different from those of the past—working with these communities towards self-sufficient models.

- While government funds are much needed and appreciated, leadership to support self-sufficiency through full-cost pricing is the only way to ensure that we are on a sustainable path.

- Investment in successful models that link technology providers, researchers, and end users (municipalities and communities), and provide access to capital markets are working and must continue.

- Lastly, we in the water sector have a compelling good news story to tell and promote globally—it has the potential to position Canada as a clean-tech leader for the benefit of both the economy and people.

This issue of Water Canada presents some forward-looking ideas and low hanging fruit (yes, it still exists). We also include some strong voices to assist government leaders in setting the course. The stakes are high. On page 8, we discuss a current stalemate between the International Marine Organization and the United States regarding ballast water treatment. On page 14 (Straight Flush), we delve into an international effort to regulate non-flushable consumer goods that cost municipalities \$250 million annually. On page 7, an Ontario clean-tech company speaks to the need to get beer breweries onside with wastewater treatment before they affect the health of our waters and municipal systems. On page 18, we also honour the recipients of the 2016 Water's Next Awards—people and companies dedicated to on-the-ground solutions to water problems. I hope this issue will inspire new ideas and enable greater understanding between various groups. Yes/no? We want to hear from you! If you see value in maintaining this conversation nationally, please reach out to me. Let's innovate together to protect our precious water resource for future generations. We can then look back and tell the story of 2016 — a historic year in water management. **wc**

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WaterCanada



BRIAN OWENS

Brian is a science journalist and editor whose work appears in *Nature*, *New Scientist*, and *BBC Future*.
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NATHANIEL DAVID JOHNSON

N. David is a freelance reporter and photographer in Port Colborne, Ont.
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TIM VAN SETERS

Tim is a manager of Sustainable Technologies at Toronto and Region Conservation Authority.
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SARAH POLLOCK

Sarah is a freelance photographer and environmental scientist.
COVER and EVENTS



ABOUT THE COVER

Inspired by an edition of *New York Times* magazine, WC's editor drew on a team of close friends to execute this image. Visual artist and curator Chloe Shackelton found the site at Oakville's Clarity Centre, directed the set, and was our model; artist Kat Lantz did the chalk art; and Sarah Pollock did the shoot.

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- **Controversy over Great Lakes water**
- **Canadian River Institute celebrates 14 years of research**

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Off the Grid

Portable system brings wastewater treatment to remote locations. BY BRIAN OWENS

A LARGE WHITE SHIPPING CONTAINER will soon be delivered to CFB Galetown in New Brunswick, but its contents will not be the usual paraphernalia of a military base. Instead, it will house a self-powered, portable wastewater treatment system, designed by PEI-based company Island Water Technologies.

The military deal is the first commercial sale of IWT's Regen system, a portable, solar-powered autonomous wastewater treatment facility that can be installed just about anywhere. Patrick Kiely, chief executive of IWT, said that has been his goal since his post-doctoral work on environmental microbiology at Penn State University.

"A big driver for me was always to do good, marrying wastewater treatment with renewable energy so they didn't need to be tied to the grid," he said.

Inside the box, the Regen system is a fairly standard fixed-film, single pass biofilter system—though Kiely worked with engineers at Carleton University to tweak the plastic substrate, allowing more biomass to grow in a smaller area. The wastewater moves through a first chamber, where the biofilter scrubs organic pollutants from the water, and solids settle to the bottom of the tank. It then moves to a second chamber where there is a trickle filter optimized for high flows, with a further biofilter. A single Regen module can provide wastewater treatment for 75-250 people, and multiple modules can be linked together to expand the treatment capacity.

The goal is to produce an output that is suitable for direct discharge. Rob Jamieson, an ecological engineer at Dalhousie University in Halifax, spent the past year testing a prototype in Truro,

and said that goal has been met. "The effluent is comparable to that seen from any secondary treatment system," he said.

But the main innovation is the ability to go off-grid, and to run it remotely. The system also includes IWT's Sentry remote-monitoring system—an embedded biosensor that tracks the treatment system's performance in real-time, and allows it to be controlled and tweaked from a distance. "It's self-powered, but it's smart," said Kiely. "It can be monitored and controlled remotely."

Being self-powered is important, said Kiely, because wastewater treatment typically accounts for around three-to-five per cent of power consumption. And many of the places that need wastewater treatment are far from the electrical grid. Jamieson, who does research in the Arctic, said it could be perfect for some of the small, remote communities he works in. "They have a lot of challenges for water treatment," he said. "Some of the more traditional energy sources are in short supply."

That portability and self-sufficiency is what attracted the attention of the military, said Kiely. Currently the military trucks its wastewater out of remote locations, like forward operating bases, at great expense, or mixes it with diesel fuel and sets it alight in "burn pits." A Regen module is much more economical and environmentally friendly solution.

Kiely hopes that not only will his own invention be successful, but that it will also be the catalyst that drives innovation in the wastewater industry. "We want to promote a decentralised wastewater treatment system," said Kiely. "We want to be the people who provide the technology that allows that industry to flourish." **WC**

New Brew



Changing mindsets so clean water and industrial growth can co-exist. BY DEREK DAVY

THE CONSUMER THIRST for craft beer and locally made food has been great for small businesses, creating many jobs in both large urban centres and in smaller communities. Sales for craft beer are growing at a rate of 20 per cent annually in Canada, and even faster in the U.S. Municipalities encourage local enterprise, yet are often challenged with the untreated wastewater that comes from food and beverage industries, affecting clean rivers and lakes as well as aging infrastructures that are often at, or over, capacity.

The impact of beer making on water is huge, and more often than not, breweries are in crisis mode when they start to grapple with wastewater management. At ECONSE, we've been sitting down at the table with craft brewers and municipal stakeholders to talk about solutions, and move forward in a positive way. We're focused on designing water solutions with the right mix of technologies for craft brewers, so they can save money by cutting the amount of water they're using and not having the headache of expensive construction.

The situation faced by craft breweries that have been charged or warned by their municipalities is that there are only two immediate choices to stop the contaminated wastewater from entering the system: truck it or treat it. Trucking the wastewater away seems easy enough. It might cost \$500 a load or more one or twice weekly for small- to medium-

sized craft breweries. But it's a stop-gap solution and the companies hauling liquid waste are beginning to turn away from brewery wastewater because they can't legally dump it. So the only other solution is to treat it on-site. Traditional technologies are being brought in to some breweries but they're expensive, require extensive building and specialized skills to operate and maintain. We prefer to use proven new technologies that are more affordable than water fines, and easy to install and operate. We designed our system to be modular, so brewery owners can incrementally install equipment as needed as the operation grows.

Changing people's mindsets and behaviors is the biggest challenge for new solutions going into the market, especially when processes and procedures within organizations plays into decision-making. We're seeing that with both the craft brewers and the municipalities. It's hard to start doing things differently. Let's just start by agreeing that water sustainability matters, that clean water matters to us, our families and our communities, and that we want the best solutions that are easy to implement. wc

This article has been abbreviated for use in Water Canada magazine by Derek Davy, a business development manager for ECONSE Water Solutions. Read the full article online at bit.ly/BrewNew.

Online at
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NEWS: Ralph Pentland's response to the Waukesha Lake Michigan diversion decision. bit.ly/PentlandLMich

AT THE DESTINATION PORT



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Sleeping Giant

Over 80 per cent of the world's trade is carried by shipping, but with it, comes the risk of invasive species. Trojan Technologies is set to revolutionize the industry, but U.S. regulatory hurdles must be overcome.

BY KATHERINE BALPATAKY

ON A HOT SUMMER EVENING IN 1988, a group of researchers from the University of Windsor boarded a small vessel on Lake St. Clair to do a local survey of freshwater species. Upon inspecting a bucket of rocks from the bottom, a young graduate student discovered an unknown species that would soon become so prolific throughout the Great Lakes that it would threaten water quality and health of Great Lakes fisheries, and would cost businesses, governments, and landowners over \$100 million annually.

The tiny creature in the bucket was none other than the zebra mussel, a native of Russia. Travelling as a stowaway in the ballast of a cargo ship, it had been emptied into Canadian waters according

to the standard and necessary practice in order to balance a ship with cargo. The zebra mussel wasn't the first species to migrate in this way. Scientists have known about the problem since the early 1900s. But it became the wake-up call for Canada and governments worldwide concerning the dire consequences of letting non-native species invade their waters. Shortly afterwards, Canada and Australia brought their concerns to the attention of the International Marine Organization (IMO), and thus began a 30-year process of complex negotiations among IMO nation states to adopt global regulations to address ballast water transfers.

In order for the regulations—known

as the International Convention for the Control and Management of Ships' Ballast Water and Sediments (the Convention)—to come into force, they must be ratified by 30 nation states, representing 35 per cent of world merchant shipping tonnage. The Convention currently sits one or two nations short of making this happen. The most significant holdout is the United States, mainly due to concerns related to the certification process used to approve ballast water treatment equipment. To this day, cargo vessels continue to dump untreated ballast water in the Great Lakes (they are merely flushed with sea water). It's just a matter of time before the next devastating invasion occurs.

The Welland Canal is part of the St. Lawrence Seaway, that connects the Great Lakes to the Atlantic Ocean. This photo is taken in Port Colborne, Ont.



Ballast water is taken on board vessels to aid in propulsion by submerging the rudder, reduce stress on the hull of the ship, and to compensate for weight lost from fuel.



Zebra mussels (right) were one of the most devastating invasive species to enter the Great Lakes. Ship-borne invasive species are responsible for at least \$200 million in annual losses in the Great Lakes region.



In response, London, Ont.-based Trojan Technologies, has developed a technology solution that is set to revolutionize the industry and capture a significant portion of this greater than \$15 billion market (by some estimates, a \$34 billion from 2009 – 2020). Trojan has embarked on a journey to convince the U.S. Coast Guard and U.S. Congress that the best available science supports the use of UV treatment, and that Trojan's purpose-built ballast water solution is the most effective and energy-efficient technology in the market to prevent future invasions from occurring.

A way down southern Ontario

To understand Trojan Technologies' position in the world of ballast water treatment, it's important to understand their roots in ultra violet (UV) water and wastewater treatment. The company was

founded in 1976 by a young entrepreneur, Hank Vander Laan, a London Ont. native, who had the foresight to buy the patent for UV treatment of water from a small company which made metal toolboxes.

"When you live in rural areas and drink from a well, there is a pretty good chance that your water will be contaminated at some point in time," said Trojan's president and CEO, Marv DeVries. As DeVries explained, Vander Laan understood that UV could be used to treat well water for households use, and the company later expanded this concept to apply UV treatment for both municipal drinking water and wastewater. The groundbreaking leap occurred when they

set up their very first open-channel UV disinfection system in Tillsonburg, Ont. With some pioneering scientific work done in partnership with Environment Canada, the company tested a system

The zebra mussel became the wake-up call for Canada and governments worldwide concerning the dire consequences of letting non-native species invade their waters.

that would disinfect wastewater using the existing treatment plant setup, by installing UV lamps within open channels. "Before this, all wastewater treatment plants were using chlorine to disinfect their effluent. Tillsonburg was



Trojan Marinex Ballast Water Treatment systems are assembled in Trojan's London, Ont. facility.



Space is limited on a vessel, and equipment needs to be able to fit through access holes and in cramped quarters.



To ensure filtration reliability, Trojan tested its technologies using mixtures of water and marine mud from around the globe to mimic the most challenging of potential treatment demands.



In June, Trojan Marinex received the 2016 Outstanding Private Sector Achievement award from the Reduce Risks from Invasive Species Coalition.



A Trojan Marinex BWT unit being lowered down a narrow hatch.



Resembling a Star Wars robot, the Trojan Marinex unit.

the first open channel UV installation in the world [to be] set up so that there were two halves of the plant, where chlorine and UV could be run side by side. [...] It proved that a very high degree of disinfection could be achieved using UV," DeVries said.

The company's history and evolution have been instrumental to its current position in ballast water because for over 30 years, the team have been aggressively improving the treatment capacity, energy efficiency, and decreasing the footprint of UV systems to meet the needs of municipalities. "If you take a large vessel like a supertanker, it will actually have an intake pipe that might be three feet in diameter," said DeVries. "You are treating

as much water as a medium sized city—in terms of flow rate, about the same as the City of London." The treatment system must also be extremely compact, and the energy requirements of a conventional system are simply not available on a ship. To address these limitations, Trojan has developed a system that uses less than half of the power of any other UV system on the market. As well, using UV eliminates the need to handle and dispose of many chemicals—an advantage for public safety, the environment, ballast corrosion, and other limiting factors.

IMO versus the U.S. Coast Guard

For nearly 60 years, the IMO has convened member nations (now

totalling 170) in order to promote marine safety and pollution prevention, as an established body of the United Nations. For the last 30 years, IMO nations have been working to develop regulations for ballast water management to prevent the spread of invasive species. They have succeeded in adopting guidelines, but have fallen short of legally-binding rules for ship owners, largely because of a difference between the recommended approach by the U.S. Coast Guard and the remaining IMO nations that occurred in 2009/2010. The split is particularly troubling for the shipping industry, because once the Convention is ratified, all ships will be required to implement a ballast water management plan that is

consistent with the rules the next time they dock for maintenance.

"This equipment is not cheap," said Christian Williamson, Trojan Technologies' senior vice president who is working on the ballast water issue. "It is one of the most expensive pieces

5,000 vessels have procured equipment and about 2,000 have installed it. Yet, the estimate of the number of ships that will need to respond within five years of when the decision is made is something in the magnitude of 30,000 to 50,000 vessels.

The U.S. Coast Guard's intentions with their independent standard was to ensure the standard was more robust and reliable—to prevent some countries from exploiting loopholes while gaining certification on measures such as data collection and laboratory testing. Williamson said

that many of the Coast Guard's changes to the IMO Convention are prudent and welcomed. In fact, Trojan has proceeded to adopt many of the measures their own testing of the equipment to ensure it will meet the highest standards.

But the sticking issue lies in a

particular test method that is needed to quantify the effect of water treatment methods on phytoplankton (the class of single cell microbes that are 10-15 micrometres in size). To certify equipment, the IMO has utilized a method known as MPN (Most Probable Number), whereas the U.S. Coast Guard has recommended utilizing another method known as Vital Stains. Each method is used to determine whether new treatment technologies are "capable of removing, or rendering harmless or killing organisms," or in the case of the IMO, whether the organisms are still "viable," meaning, able to reproduce.

"The position that the U.S. has had is, 'you need to kill the organisms'," said Williamson. For Trojan, this detail is crucial because the UV system does not actually kill the organisms instantly; rather, it damages their cells so that they can no longer reproduce. The MPN method measures an organisms' ability to reproduce. "Organisms can't invade, if

Ship owners globally are in this quandary of needing to buy this equipment—but not knowing if it will ultimately be accepted for use in U.S. waters.

of equipment that gets installed on a vessel. From a shipowner's perspective, it's a really big deal to get it right when they purchase the equipment, because they expect it to last the entire life of the vessel, which can be greater than twenty years," he said. At present, only about



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they can't reproduce," said Williamson. This has become such a big issue in the U.S. that the issue was discussed at a congressional hearing in late April. There is also a body of science, including some highly respected new research, that suggests that the Vital Stain method endorsed by the U.S. Coast Guard is not suitable for providing "reliable and repeatable" results, and that the MPN method is the best method available.

Scientific evidence

John Cullen, a professor in the Department of Oceanography at Dalhousie University is one of the world's leading experts on the effects of UV on the marine environment. He has also recently published research that would suggest that the MPN method is preferable to the Coast Guard's Vital Stains method.

Cullen said that he first encountered Vital Stains 30 years ago while collaborating with Professor Hugh

Macintyre in Maine. "We were using them to monitor the viability of certain species in the dark. We found out in fairly short order that they worked very well for certain species, and for other species they didn't work well at all. They were essentially giving us the wrong answer," said Cullen.

Years later, Trojan Technologies approached Cullen's group with an interest in testing the methods to quantify the effectiveness of their UV treatment systems, particularly for phytoplankton. "The questions were interesting and we had the relevant expertise, so we established a university-based research partnership that was ultimately co-funded by the NSERC (Natural Sciences and Engineering Research Council of Canada)," he said. The researchers have since published a peer-reviewed scientific study in a high impact journal that shows conclusively

that the Vital Stain method used by the Coast Guard cannot be considered reliable and accurate for all species of phytoplankton. They also disproved some of the previous doubts regarding the MPN method employed by the IMO.

The Great Lakes are ground zero for the issue of invasive species, and as such, Canada is trying to maintain the relationship with the U.S. Coast Guard.

Cullen said, "When we began our research, the MPN method for counting viable cells in natural phytoplankton communities had a bad reputation, primarily because it was thought that many, if not most species of phytoplankton could not be cultured and thus would not be counted using


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the MPN method. But after we carefully reviewed the scientific literature on MPN over the past 60-plus years, we realized that the method was much less prone to error than previously thought.”

Evidence-based decisions

Having undergone trial testing over three years and its own peer-reviewed research to support the effectiveness of their UV treatment technology, Trojan was the first company in the world to submit its 3,000-page application for certification from the Coast Guard in March 2015. They were one of three companies to submit, including a Swedish firm, Alfa Laval and a Danish firm, DESMI. Given that Trojan had already secured IMO certification in 2014, winning U.S. approval would mean that the company would be able to provide the first universally certifiable option for ballast treatment. In spite of this, the company was denied certification, on account of the MPN/Vital Stains quandary.

“To date, no one in the world has received U.S. certification,” said Williamson. “So ship owners globally are in this quandary of needing to buy this equipment—especially with the IMO getting close to ratification—but not knowing if this equipment will be ultimately accepted for use in U.S. waters. It’s a nightmare situation for vessel owners.”

“Canada is a very important partner in this process because we share a border,” said DeVries. “The Great Lakes are ground zero for the issue of invasive species, and as such, Canada is obviously trying to maintain the relationship with the U.S. Coast Guard.” While Trojan, along with many other stakeholders in the world, are working closely with policy makers in the United States to help reverse the U.S. Coast Guard’s position on the MPN method, their hope is that the Canadian government will also show increased public support.

The opportunity

Shipping moves more than 80 per cent of the world’s commodities and, in doing so, transfers three to five billion metric tons of ballast water every year. The people at Trojan believe that they are positioned as one of the top players to capture the retrofit market, due to the rigour of their testing, and the competitive features of their treatment system. “Our technology is compact and energy efficient; and for the level of robustness, reliability, and rigour of our testing methods—we think that history will show that we are on the right side of this argument,” said Trojan’s chief technology officer, Linda Gowman. “If ever there was a clean technology that’s ready for the market in a place and time that needs it, this is it.” WC

Katherine Balpataky is Water Canada’s editor.

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Toilets are not garbage cans. Fats, oils, and grease should not go down the sink or toilet. These photos show various sewer system infrastructure sites impacted by improper disposal choices.



Straight Flush

Canadian wastewater operators are leading the charge to create an international standard defining what is truly “flushable.” BY EVE KRAKOW

WORKING IN THE wastewater facilities and sewers of London, Ont., Barry Orr has pulled apart many a blockage—huge wads of materials that should simply not be there. The latest culprit: baby wipes. “It used to be dental floss, cotton swabs, feminine hygiene products, maybe a toy. Now it’s [all that plus] wipes, wipes, wipes.”

The problem is twofold: people disposing of regular wipes down their toilets, and wipes marketed as “flushable” that do not actually break down in the sewage system.

Moreover, wipes compound problems already caused by non-desirables such as fats, oils and greases (FOGs), and dental floss, which grab onto the wipes

and snowball into huge blockages, also known as “fatbergs.”

To address the issue, Orr and other members of the Municipal Enforcement Sewer Use Group (MESUG) have been leading efforts to create an ISO standard that would define what can be labelled as “flushable.”

The ISO process

MESUG is a group of Ontario environmental officers, wastewater operators, technicians, managers, and administrators. A few years ago, they submitted a proposal to ISO’s technical committee on municipal water and wastewater services (TC 224) to develop a Technical Specification on Flushable

Products. The proposal was supported by over 14 member countries, including the United States, Great Britain, France, Germany, Holland, Spain, Portugal, Australia, and Japan. In 2014, an international working group was created.

Duncan Ellison, former executive director of the Canadian Water and Wastewater Association (CWWA), is the working group’s convenor. He explains that each country has its own advisory (or mirror) committee to the international group. While the absence of wipes manufacturers in Canada means that Canada’s mirror committee includes mostly wastewater representatives, the mirror committees in the U.S. and Europe are composed equally of manufacturers

and wastewater engineers.

Consensus, therefore, will not be easy. "The dominant manufacturers are looking for performance standards that will allow their [existing] products to be certified," said Ellison. "On the wastewater side, we're looking for performance standards that will ensure rapid deterioration or disintegration of the material that is flushed." Yet he is hopeful, noting there are manufacturing industries in Europe and China producing raw material for wipes that would disintegrate just like toilet paper.

The international working group was scheduled to meet at the end of June 2016 to discuss the latest draft. Ellison has stepped up the pressure by warning members that if they cannot agree on certain policy issues, he will elevate these points to the technical committee itself. Some contentious issues include whether a specific disintegration test will be mandated or whether an alternative type of test would be allowed, and whether certain types of coatings, chemicals, and materials would be prohibited. Ellison hopes to see the standard published in 2017.

Voluntary vs. regulatory

Although an ISO standard is not binding, it can bring about action in two ways. First, manufacturers may find it to their commercial advantage to adhere to the standard voluntarily, in the same way as hundreds of thousands of companies worldwide are now certified to ISO 9000. Second, it can serve as a basis for national standards. In this regard, an ISO standard would give municipalities and the wastewater community something to bring to legislators and policy-makers.

"When you try and develop localized laws, you want to start from the point of an international standard so as to support trade," explained Robert Haller, current executive director of CWWA.

Parallel to the ISO process, Haller and others are working with the Association of the Nonwoven Fabrics Industry (INDA) to develop voluntary industry standards. While INDA does have a guidance document on this



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issue, known as GD3, the wastewater industry never approved it. "We don't believe GD3 is good enough: products do not disperse quickly enough and are still clogging up systems," said Haller.

This issue is costing Canadian municipalities over \$250 million a year in extra maintenance costs.

Wastewater representatives are therefore working with INDA to develop a new guidance document, GD4. A technical committee is trying to develop a wipe that will break down quickly, while the Product Stewardship Initiative is looking at how items are labelled.

"There's a lot of confusion in the market," noted Haller. So-called flushables often sit side-by-side non-flushables on store shelves. The correct method of disposal tends to be in fine

print. "We want any item that might end up going down your toilet to be labelled non-flushable. Instructions to the consumers need to be clear."

Although Haller is not sure how effective a voluntary program would be, he'd like to eventually see it enforced by regulatory measures. "This would support the industry by protecting companies who are putting in time and money to research and develop a good product."

Taxpayer dollars

Based on its surveys with wastewater operators, MESUG estimates this issue is costing Canadian municipalities over \$250 million a year in extra maintenance costs. "That's not even taking into account operational costs or capital costs," adds Barry Orr. In the U.S., a number of cities have initiated lawsuits against

manufacturers for damages caused by wipes marketed as "flushable."

Although baby wipes are the main target, an ISO standard defining what is flushable would apply to any item that consumers might drop into their toilets. At the moment, all kinds of items are marked flushable, from tampons to scrubbing brushes.

Of course, the problem could be solved tomorrow if people simply put these items in a garbage bin instead. In his 20 years in the business, Orr has never seen so much garbage in our wastewater. "Go into a screening room at a wastewater treatment plant, and it's absolutely horrendous, the amount of garbage coming down the pipes," he said. **WC**



Eve Krakow is a freelance writer based in Montreal.



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Water's Next winners received a plaque and an individually hand crafted glass pin by artisan glassblower Aaron Calenda of Guelph, Ont.

water's next awards 2016

Celebrating Canadian water leaders and champions



Welcome to Water's Next 2016.

WATER CANADA magazine's Water's Next Award program is the only national awards program to honour leadership across the entire water sector—including public servants, non-governmental groups, researchers, municipalities, and technology providers. Since 2010, Water Canada has hosted the awards to help strengthen and celebrate the thriving national community by showcasing Canada's water leaders, champions, and innovators.

We believe that it is important to celebrate these accomplishments, because so many of the accomplishment that our finalists and winners have

achieved go unrecognized by the broader public. And yet, our community knows that clean drinking water, healthy rivers, safe wastewater, and tools to help communities understand water a truly are major accomplishments. Our hope is that by telling their stories, we will inspire the next generation of great ideas and efforts to spur innovation.

This year, we owe the success of the program to the 15 outstanding and well-respected water experts who participated on our selection committee. Their guidance in the selection of our eight finalists demonstrates some great breadth of knowledge and experience.

The Water Canada team is thrilled to profile the stories behind the well-deserved winners, and to have celebrated their success during our 2016 Water's Next Gala on June 23rd at the Hilton Toronto Hotel (*see People and Events on page 40*). A heartfelt thanks goes out to the 30 people and groups who submitted nominations and to the generous sponsors who made the Gala a success.

Lastly, we want to say thank you to the winners and finalists for all that you bring to the water sector, your vision, and persistence to protect our most precious resource. We proudly celebrate you in these pages.



watersnext.ca



Young Professional: Christine Harries, SNC-Lavalin

CHRISTINE HARRIES is a young engineer who believes strongly in the value of networking and mentoring. Her ability to motivate, communicate, and collaborate with people from different fields, to contribute original ideas and to see the big picture permeates both her day-to-day work and the many professional volunteer activities in which she is involved.

Harries studied building engineering in Concordia University's co-op program, graduating in May 2013 with Great Distinction. During her final internship, the Quebec engineering firm SNC-Lavalin offered her a scholarship, and later, a full-time job.

Now an engineer in building structures at SNC-Lavalin, Harries works closely with water process engineers to provide optimal building structure designs for both wastewater treatment and drinking water production for the Greater Montreal area. She is currently working on the structural steel and concrete design for a major new water treatment plant.

Project manager Michelyne Tremblay says the industrial nature of the project demands close co-operation by people from many different fields. "We constantly receive new requests, have to change things, consider new options. Christine contributes and works very closely with all the different disciplines to make it happen." Moreover, many of her recommendations and innovative proposals have led to time, financial and energy savings.

Harries credits her achievements to the trust and respect shown by her supervisor and co-workers. "My boss really gives me an independence and freedom to show what I'm able to do and to be a leader in the structural team," she said.

Her contributions extend far beyond her job. In 2012, Harries joined the young professional network ("Forum") of the Quebec association of engineering consulting companies (AFG), and became a member of the board of directors in

2014. She sits on its building and conferences committee, helping to plan professional development events that bring together not just young engineers, but also young lawyers, urban planners and architects. Last year, Harries represented Quebec on the Young Professional Network of ACEC-Canada (Association of Consulting Engineering Companies). At their 2015 Leadership Summit, she spoke about the importance of networking, mentoring and co-op programs.

This year, she is ACEC-YPN's first female president. She believes that women who are passionate about their work need to step up to the plate. "There are many opportunities for all young engineers to develop the skills to work towards being a leader. It's up to us to put in the time and leg work to seize them."

Whether it's speaking at career fairs, working in her church's community kitchen, participating in the Great Canadian Shoreline Cleanup, or being a judge for the Great Canadian Northern Concrete Toboggan Competition, Harries finds huge benefits in volunteering. "You meet so many different people with whom you otherwise wouldn't cross paths." Through her involvement, she has also gotten to know people within her company who are outside her team, providing her with a network of experts and resources to draw on in her daily work.

Next to buildings, her biggest passion is playing and composing music, especially piano. She loves nature and the outdoors, and is a former lifeguard and ski instructor.

Harries is now working part-time on a Master's degree in structural design at Concordia. Eventually, she'd like to play a more managerial role where she can see the full scope of projects. Above all, she loves having different people around her. "My goal as a leader would be to know my strengths and those of the people in my group, and then to use those strengths to work as a team." —Eve Krakow



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Business:

Pat Whalen, LuminUltra

AS THE SON of a consulting chemical engineer, Pat Whalen developed his keen interest in water treatment at an early age. Now the president and CEO of Fredericton's LuminUltra Technologies Ltd., Whalen has become a highly successful and sought after expert in the management and mitigation of microorganisms in water processes.

His company offers solutions based on the real-time measurement of microorganisms in water and wastewater processes through their innovative second generation ATP test. "[Our] solutions focus on the ability to proactively monitor microorganisms in any type of water-based process," Whalen said. "As the old adage goes, 'If you don't measure it, you cannot control it.'"

Their products are pivotal in helping water operators solve microbiological challenges before they get too serious and cause public health concerns or infrastructure damage. Technicians at facilities that implement LuminUltra's monitoring tools are quickly alerted whenever there is a microbial issue, and the real-time feedback means testing turnaround time can be shortened from several days to mere minutes. This means operators can quickly and immediately identify, address, and validate microbiological control solutions while in the field, saving both time and money.

"I strongly believe that microbiological control is one of the next big frontiers in water treatment," Whalen said. "Both LuminUltra and I are committed to spreading awareness as to the implications microorganisms can pose on water systems of all shapes and sizes."

LuminUltra has expanded from its original focus on

wastewater treatment applications to include testing solutions for other markets, including industrial water treatment, upstream oil and gas, and drinking water management.

Under Whalen's leadership, the company has grown from three employees in 2003 to 33 at the start of 2016, and the company has achieved an average of 35 per cent revenue growth year-over-year for eight consecutive years. They can now also boast about having a global customer base that includes a number of Fortune 500 companies.

Whalen said a customer-first approach goes a long way in fuelling his success. "We always have been and always will be committed to developing solutions based on customer feedback," he said. "Not only do we want to strengthen our connection with each of our customers in order to enhance their experience with our products, but we also want to empower them with robust tools that lead to their achievement of proactive microbiological monitoring."

Later this year, Whalen and his company will launch LuminUltra Cloud, a cloud-enabled expert system that will help customers understand how to best use the data collected from their test kits. They are also working on developing a simplified version of their second generation ATP test, while introducing new tests that provide actionable information about microorganisms such as metagenomics.

Whalen also has his sights set on changing attitudes in the sector. "Both the company and I are working hard every day to change philosophies of microbiological control in water treatment from a reactive to a proactive basis," he said.

—Rachel Phan



Academia/NGO:

The Chiefs of Keewaytinook Okimakanak, Safe Water Project

THE TROUBLING, persistent water issues that have plagued Canada's First Nations communities weave a well-known tale of woe. But, emerging from Northwestern Ontario, is a story of hope, confidence, and empowerment that is ultimately yielding success.

Keewaytinook Okimakanak (KO) is a non-political tribal council made up of the Chiefs of six First Nations communities: Roy Dale Meekis, Joseph Crow, Chris Kakegamic, Vontane Keno, Caroline Keesic, and Alice Sugashie. The Chiefs use their intimate knowledge of their communities to provide services in all areas, including water. Building on the success of the Keewaytinook Centre of Excellence—a water operator training facility in Dryden, Ont.—the Chiefs developed the Safe Water Project, an innovative approach to delivering clean drinking water to First Nations that started in May 2015.

"The Safe Water Project is a community-led approach that provides each community with operational support for their water and wastewater facilities, focused training plans for the local operational personnel, and remote water quality monitoring technology that provides early warning of adverse water quality events," said Barry Strachan, the KO public works manager.

Unlike previous solutions that were imposed on the communities through programs like the federal government's First Nations Water and Wastewater Action Plan (FNWWAP), the KO Chiefs recognized that the only real, lasting solution is one that actually empowers communities to manage their own water. The Project succeeds where federal government programs failed because it garners full participation and investment from its community members (*see "Recipe for Hope" in Mar/Apr 2016*).

"The communities understand the importance of the Safe Water Project and have provided us with unqualified support for the work we are doing," Strachan said. "Beyond a sense

of hope, there is now a real feeling of pride at the community level stemming from the unprecedented accomplishments that have been achieved in such a short period of time."

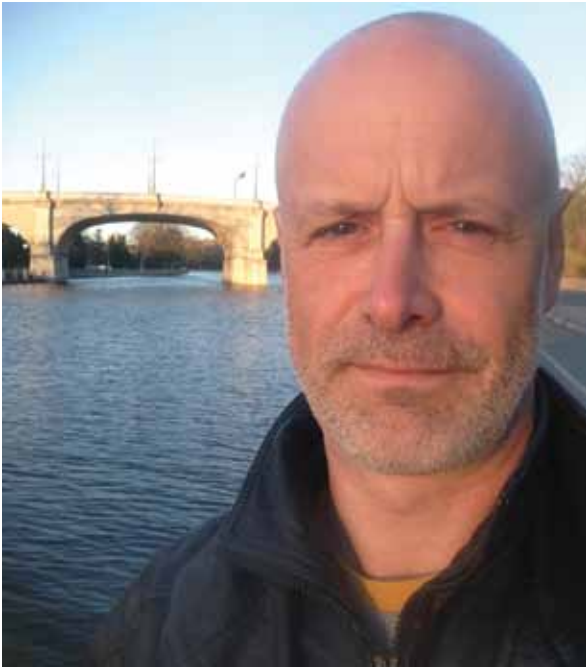
The Safe Water Project is the only First Nations-led initiative in Canada that has successfully been able to eliminate boil water advisories in First Nations communities. In its first year of operations, the Project has already lifted the long-standing boil water advisories in three communities. It is also close to lifting a boil water advisory that has been in place in one community for more than 15 years.

Financially, the Project has eased a number of burdens: cash-strapped communities no longer have to pay for costly alternatives, like having bottled water shipped in or paying third-party agencies to act as a community's saviour. "Our Safe Water Project is a model that shows other communities how improvement in their water and wastewater operations can be improved from within, without external influence," Strachan said.

While the short-term focus for the Project is to adequately train local operators, the long-term goal is to eventually take a step back. "The Tribal Council will continue to provide support services for local operations, but our direct involvement will progressively diminish over time as capacity and confidence at the local level increase," Strachan said.

After a May 9, 2016 meeting with officials from Indigenous and Northern Affairs Canada, the team anticipates that funding for the Project's continuation in KO communities and its expansion to another 14 First Nations communities in Ontario will be approved.

Isabella Tatar, the Project's strategic planner, said, "We feel that we were able to convey the important role that the Project can play in helping the federal government meet its commitment to ending boil water advisories in First Nations communities within five years." —Rachel Phan



Government: François Soulard, Statistics Canada

FRANÇOIS SOULARD'S CAREER has been defined by a number of 'ah-ha!' moments. One of the first occurred while working on his Ph.D. at the Chinese University of Hong Kong in the early 1990s. "I began to really understand how statistics did not need to be overly complicated to provide powerful depictions of the world around us," Soulard said. "The link to natural capital accounting (providing concrete data on the state of natural resources using statistical analysis) came to me intuitively when I saw the extent of the transformation of the landscape in Southern China while doing fieldwork."

The next 'ah-ha' moment for the current Chief of Research & Development of Statistics Canada's Environment Program occurred during the 1998 ice storm, when Soulard had only been with the department for a few months. "I remember pacing the corridors wondering what to do to help, and soon realized that, since we are in the business of providing information, that perhaps I should do just that," he said. "As a result we quickly produced a study of the ice storm that, to this day, is still downloaded a couple thousand times each winter. This is when I realized how much of a treasure chest for environmental data StatCan was—especially from the spatial perspective with incredibly detailed geographic data."

This insight eventually inspired Soulard's work to develop the concept of 'water accounts'. Water accounts are defined as the process of systematically measuring the stock, flow, and renewal of Canada's surface and sub-surface water in physical, quality, and/or monetary terms. Once these data have been collected and compiled, government policy-makers and legislators are able to make evidence-based decisions with respect to water resources.

"François has been working for over fifteen years in the development and improvement of water statistics in Canada and internationally," said Mark Henry, a member of Statistics

Canada's Environment Accounts and Statistics Program and one of Soulard's colleagues. "He has developed, overseen and promoted new and innovative methods and standards for estimating, measuring, and analyzing our water resources and their use." Henry added that Soulard has played a key role in developing international methods and standards through his work with United Nations Statistics Division (System of Environmental-Economic accounting—Water and UN—Experimental handbook on ecosystem accounting), the OECD, and the World Bank; as well as with individual countries like China and regions such as South America. "As a leader within his division at Statistics Canada, He fosters an environment of exploration and innovation among his colleagues and staff and is seen as a champion of water and environment issues within the department."

François Soulard was modest about winning a Water's Next award. He said, "The credit belongs to my team, not just me." He asked that his colleagues be recognized as well. For the record, they are Mark Henry (water asset account; freshwater ecosystem account), Murray Cameron and Chris Tremblay (industrial water use survey), Terry Nelligan (survey of drinking water plants), Avani Babooram (agricultural water survey), Gordon Dewis (households and the environment survey), Matthew Prescott and Joe St Lawrence (physical flow accounts for water), and Jeff Fritzsche (chief of the water surveys section).

"It is always useful and welcome to be recognized by our peers," Soulard told Water Canada magazine. "It is especially gratifying given the importance of the work my team is doing, which is to measure and then translate Canada's water resources such that well-informed decisions can be made regarding their use and protection. Our job is not to set such policy, but to do our best to provide government with the data they need to make good decisions." —James Careless



Drinking Water: AVIVE Water

LIKE SO MANY OTHER COMMUNITIES in Newfoundland and Labrador, Sunnyside had high levels of disinfectant byproducts (DBPs) that far exceeded Health Canada's drinking water guidelines. The high levels of DBPs—produced when chlorine interacts with organics in the water—meant conventional chlorine water treatments were out of the question.

Desperate for a cost-effective and unconventional solution for its drinking water challenges, Sunnyside sought the services of SanEcoTec Ltd. and obtained a hydrogen peroxide plant that utilized the company's AVIVE water treatment system for secondary disinfection.

"AVIVE dosing and monitoring technology is integrated with an existing water treatment process to inject hydrogen peroxide to stop the formation of DBPs, and provide an effective secondary disinfectant residual in distribution," explained Jay Whiteside, SanEcoTec's chief operating officer.

The system proved to be pivotal in providing an immediate reduction of DBPs in Sunnyside's water, which, according to Mayor Robert Snook, had "probably one of the highest [concentrations of DBPs] in the province." After an experimental three-month pilot project that launched in September 2015, the system helped lower levels of the potentially dangerous DBPs by more than 72 per cent. The town's water is now in compliance with Health Canada's guidelines.

The AVIVE system has also proven to be a cost-saving

solution for the town of 450 people. Compared to a traditional water treatment plant that would have set the community back at least \$4 million, the Sunnyside pilot project was cost shared with the province at a total \$338,100. And while in place, the system was effective in reducing the volume of treated water being used to flush the system by more than 50 per cent.

"Because the stabilized hydrogen peroxide is so effective as a residual disinfectant, water integrity in the distribution system improves as build-up and biofilm are cleared up," Whiteside said. "With that, the risk of boil water advisories is reduced, [and] disinfectant and water demand is lowered and operating costs are reduced."

With such promising results, the SanEcoTec team has its sights set on other communities, especially in the rest of Newfoundland and Labrador where more than half of the towns have either DBP issues or boil water advisories. The company also recognizes that the AVIVE system could have tremendous impacts on small, rural, and First Nations communities, where improved water treatment must be imminent and affordable.

As for its "big picture" mandate, SanEcoTec is committed to working toward a reality where people can feel confident about what comes out of the tap. Whiteside said, "We have a vision of 'healthy water' that goes beyond 'water that won't make you sick.' [...] Change is needed in water [and] better methods need to be used. We have one." —Rachel Phan



Wastewater: Pearl Nutrient Recovery Process

A SHIFT IS HAPPENING in the wastewater industry. No longer satisfied with being defined by just their treatment capabilities, wastewater treatment facilities are now dabbling—and succeeding—in recapturing and reusing resources like water, energy, and nutrients.

Playing a key role in making this shift a reality is Ostara's Pearl nutrient recovery process. The innovative closed-loop solution, which was developed at the University of British Columbia, recovers phosphorus and nitrogen at municipal and industrial wastewater treatment plants and transforms them into a highly valuable and eco-friendly fertilizer called Crystal Green.

"Unlike other nutrient recovery systems, Ostara's Pearl nutrient recovery solution is a true example of a circular economy," said Ostara CEO Phillip Abrary. "The key difference is Ostara's process creates a finished product—not a raw material—ready for commercial sale to a global network of blenders and distributors [and] to growers in the turf, horticulture, and agriculture sectors."

The fertilizer, Abrary said, not only "reduces the carbon footprint, but also helps to protect precious waterways from nutrient pollution" because of its unique Root-Activated technology. This means "nutrients are released only when roots ask for them, ensuring nutrients stay in the soil, and do not leach into adjacent waterways."

From an economic standpoint, the Ostara process provides significant cost savings for wastewater treatment plants. Facilities are able to cut back on the amount of chemical treatment needed to tackle struvite and the amount of

sludges that need to be handled, leading to fewer operation, maintenance, and capital costs. To add to that, the production of the marketable Crystal Green fertilizer means treatment plants are able to earn revenue for every ton of the fertilizer they produce. This mix of cost savings and revenue generation results in a payback of the capital costs of the system within five-to-seven years, depending on the size of the facility.

"Traditionally, compliance, risk adversity, and the need to meet heightened regulations drove innovation, but recent trends show sustainability as a major contributor to adoption by municipalities," Abrary said. "[We] have been successful in converting a risk averse wastewater treatment sector, who see Ostara's solution as a win-win economically and environmentally."

Ostara currently has nine commercially operating facilities, including the world's largest nutrient recovery facility, the Stickney Water Reclamation Plant in Cicero, Ill. Six additional full facilities are currently in construction and six are in design. Along with expanding in the North American and European markets, the company also plans to break into the agricultural market with its Crystal Green fertilizer.

"Phosphorus is an essential nutrient necessary to sustain life and grow the crops and plants needed to feed a growing population," Abrary said. "In the ground, it is a finite resource, and once mined, which is a carbon-intensive process, it often ends up back in sensitive waterways through fertilizer leaching and runoff. Fundamentally, this is a broken cycle. At Ostara, [...] we are closing the loop on the phosphorus cycle," he said.

—Rachel Phan



Stormwater: Stormceptor MAX, Imbrium Systems

WHEN IT CAME TIME for the aging Autoroute Felix-Leclerc highway to receive much-needed upgrades to its large stormwater drainage network, Imbrium Systems was there to provide a customized solution.

Located on the northern shore of the St. Lawrence River in Quebec, the highway sees an average of 140,000 cars a day, generating large amounts of potentially harmful pollutants. To comply with new Quebec stormwater treatment regulations, the highway needed to treat the heavily polluted water it was discharging back into the adjacent Orme River. But there was a problem: traditional stormwater solutions, like oil and grit separators, would not have worked in such a large treatment area. The engineers involved in the project needed to turn to custom-designed solutions instead.

Enter Imbrium's Stormceptor MAX, a customized stormwater treatment device especially equipped to treat runoff from large areas because of its flexible modular design that fits different site requirements. The device has been used by the City of Toronto to treat runoff on its waterfront to protect Lake Ontario, as well as by the City of Kitchener and in the Alberta oil sands.

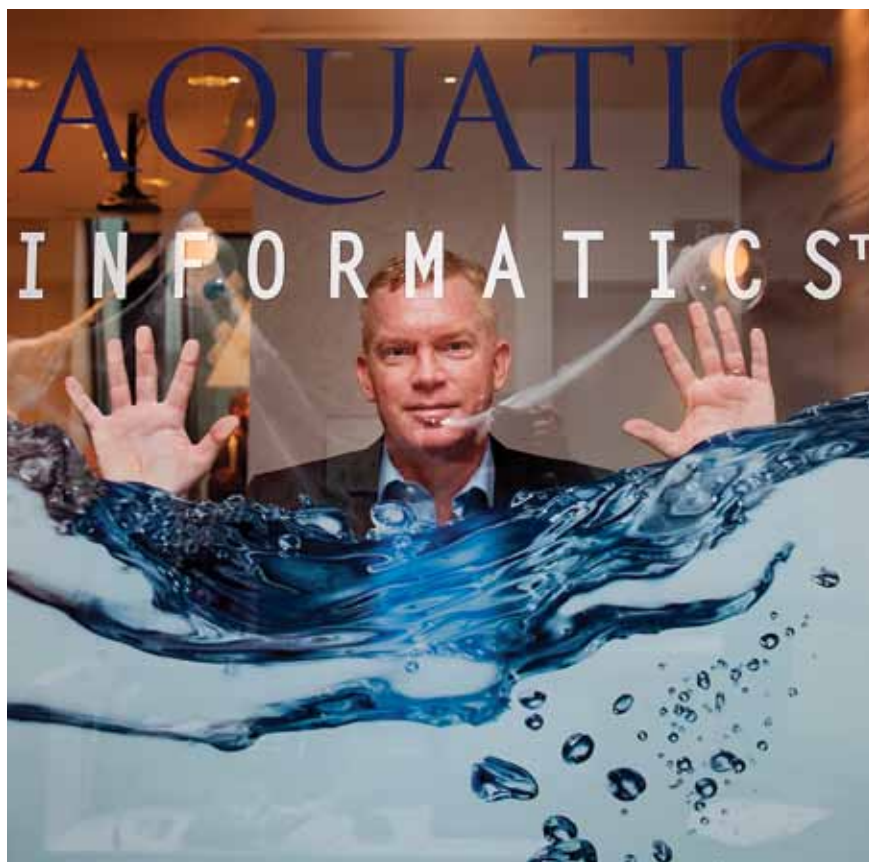
According to Imbrium's regional manager, Reagan Davidson, the Stormceptor MAX device is effective because it "slows incoming stormwater to create a non-turbulent treatment environment," which then allows free oils and debris to rise while sediment settles. The system would effectively remove the high levels of toxic, fine particulate material and oils that were entering the Orme River.

Quebec's Ministry of Transportation, along with engineers at Dessau Longueuil, saw the value of the device and, in 2014, designed a new stormwater management system for the highway that incorporated two Stormceptor MAX systems and new storm drains.

"With 80 per cent of the surrounding surface impervious, the new treatment system is designed to capture an estimated 220 cubic metres—over 150 tons—of sediment annually," Davidson wrote. This, she said, has been pivotal in preserving the Orme River's water quality, while protecting its significant ecosystem. The Stormceptor MAX also offers protection in the face of potential oil spills, which would otherwise be costly and damaging to the local ecosystem and to public health. As a result of the project's success, "further designs and even another one planned for completion of Phase 3 of this project are in the design stages," Davidson said.

Other design engineers, municipalities, and government officials are currently looking at the Stormceptor MAX's many other applications. The system could be used in the rehabilitation of older stormwater ponds, in the construction of new ponds, and even, in lieu of multiple oil and grit separators, among other possibilities.

Davidson said the device's potential as a "potent stormwater treatment tool for large sites" will be especially evident as municipalities continue to grapple with the effects of climate change. Intense storms will become more frequent, leading to "heavier runoff volumes and sediment loads"—the very scenarios the Stormceptor MAX was designed to address. —Rachel Phan



Water Resources: AQUARIUS

AGING ENVIRONMENTAL DATA MANAGEMENT SYSTEMS have struggled to keep up with modern-day realities: massive volumes of data, increasingly stringent guidelines, and demands for information to be fast and accurate.

The AQUARIUS software platform by Aquatic Informatics has positioned itself as the solution to the problem, helping municipalities and agencies make sense of the overwhelming amounts of information, and streamlining the process along the way.

“The integrated, transparent, and equitable use of water starts with information,” said Ed Quilty, the founder and CEO of Aquatic Informatics. “AQUARIUS captures data streaming off sensors in rivers, lakes, reservoirs, groundwater, and in-pipes, and alerts customers on exceedances or unusual events.”

With the AQUARIUS software, users have access to big data right at their fingertips. The software centrally stores, secures, and provides access control to data. Customers then use highly specialized tools to assess the validity and quality of the data in order to complete analytics, generate reports, and share with stakeholders. The data is then used in a multitude of ways—from assessing water quality and treatment effectiveness to determining pollution concentrations and the likelihood of flooding or droughts.

“Today’s authorities rely on AQUARIUS for insight to optimize the social, environmental, and economic benefits derived from limited water resources,” Quilty said. “Accurate data production, advanced record computations, and sophisticated analysis are required to inform decision makers. AQUARIUS creates the insight required to make the right water management decisions.”

The software is used by agencies like the Water Survey of Canada, the U.S. Geological Survey (USGS), and more than 500 other organizations in 50 countries. Quilty credits the software’s success to its rapid and continual technological evolution, its top-down strategic approach—it targets large, influential water agencies like the USGS first—and its focus on customer success.

Loyal customers are not only provided with reliable and accurate data, but the software quickly and efficiently cuts back on the manpower and time needed to handle the information. “The time savings in records reduction has been well worth the investment,” said Loren Smith, the superintendent of Water Division III at the Wyoming State Engineer’s Office. “We have realized about a 50 per cent time savings across the board, freeing up valuable limited staff time for other important work.”

As part of its mandate to rapidly evolve with the market, the Aquatics Informatics team has just released its fourth generation of AQUARIUS software, which Quilty said is “designed to scale to meet approaching limitless amounts of data.” The software’s entire solution suite is also available in the cloud, and the company continues to release new solutions, like AQUARIUS Forecast, which provides advanced environmental modelling.

In the future, the company hopes to “go beyond water” to tackle other environmental concerns. Quilty said the company sees limitless potential for their software solutions. “Our ‘big hairy audacious goal’ is to host and manage all of the planet’s environmental data for the sustainable use of natural resources,” he said. —Rachel Phan



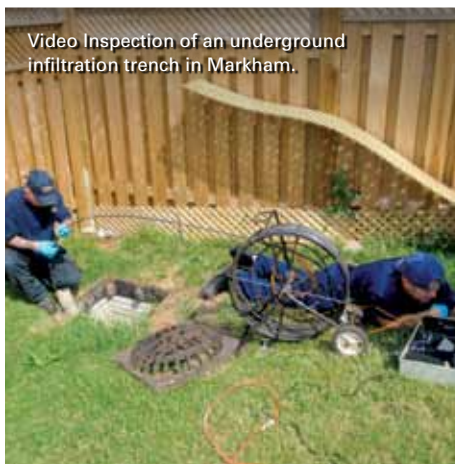
Maintenance of a front yard rain garden in Richmond Hill.



Excavation of sediment from a stormwater pond in the City of Toronto.



Clean-out of an oil grit separator.



Video Inspection of an underground infiltration trench in Markham.



Vacuum cleaning of a permeable interlocking concrete pavement in Vaughan.



Inspection and monitoring of a bioretention cell in Vaughan.

THE FIXER

The continuing challenge of stormwater maintenance.

BY TIM VAN SETERS

MAINTENANCE OF INFRASTRUCTURE is not an exciting topic of conversation. We prefer things that are new and innovative. Stormwater management technologies are no exception. We build the infrastructure with enthusiasm, but pay little attention to their future upkeep. This is true of the last generation of stormwater technologies, and it could well be true of the next generation if more emphasis is not placed on adequate maintenance of the assets.

In Ontario, ponds that sustain a permanent pool of water, referred to as wet ponds, began to be the standard stormwater treatment option for new developments in the early 1990s. In the Greater Toronto Area, there are now over 1,000 wet ponds of various sizes and ages

that help to treat and control stormwater runoff prior to release into streams and rivers. Many of these are past their best before date and are in dire need of maintenance. In 2010, Lake Simcoe Region Conservation Authority measured sediment depths in 98 ponds across their jurisdiction. Results showed that 54 of the monitored ponds needed to be maintained, and 12 were so full that they could no longer be classified as water quality treatment facilities.

Cost is arguably the most important reason for delaying maintenance. A

typical cost for cleaning out a stormwater pond is between \$250,000 and \$550,000, but costs can exceed one million dollars if complications arise. With this high

It translates into a lot of stormwater infrastructure out there that is no longer performing the way it should.

price tag and many competing priorities, it is all too tempting for municipalities to put off stormwater maintenance for another day.

Oil grit separators have suffered a similar fate. OGS are designed to trap

sediment, oil, grease and other floatables in runoff. They are typically installed underground as flow-through devices in the storm sewer network. Although there is no formal tracking of the location and ownership of units, the industry estimates that there are roughly 16,000 units installed in Ontario, with roughly 1000 new units going in each year. Sediment trapped in the units usually needs to be removed at least once a year to ensure its continued function. Best estimates from manufacturer databases indicate that only about one quarter have been inspected, and even fewer have been cleaned out.

That translates into a lot of stormwater infrastructure out there that is no longer performing the way it should. This is certainly cause for concern as the stormwater management industry evolves toward less reliance on centralized end-of-pipe facilities and greater use of decentralized micro-controls, referred to as Low Impact Development (LID). These

LID controls may include permeable pavements, vegetated bioretention, and infiltration trenches that are designed to enhance natural processes of infiltration, evapotranspiration, and filtration that are lost through urbanization.

LIDs present a maintenance challenge because there are lots of them. This requires stormwater infrastructure managers to know where they are and keep detailed records of inspection and servicing activities. Since they are also installed on private property, municipalities need enforcement

tools and other mechanisms to ensure practices are not removed and remain in good working order. How existing bylaws and agreements may be used for this purpose and the need for new regulatory tools is a topic of ongoing debate by municipalities. WC

Tim Van Seters is a manager of Sustainable Technologies at Toronto and Region Conservation Authority.



The Toronto and Region Conservation Authority recently completed two comprehensive inspection and maintenance guides. The guides are designed to aid managers of stormwater infrastructure develop and implement effective stormwater best practice inspection and maintenance plans and asset management programs. The guides are available at sustainabletechnologies.ca

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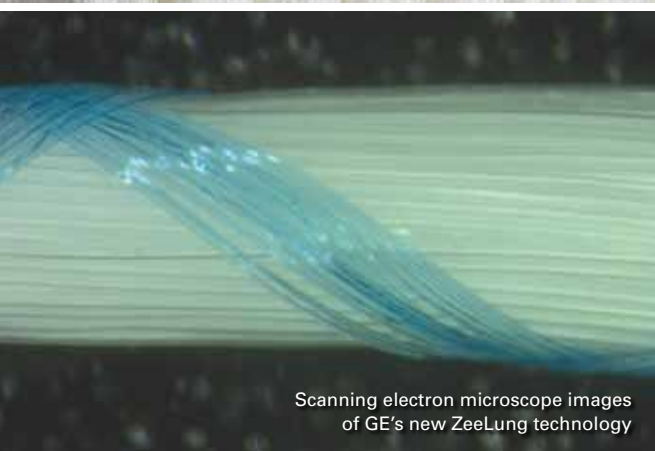
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GE ZeeLung MABR membrane up close.



Scanning electron microscope images of GE's new ZeeLung technology

Wastewater of the Future

GE's ZeeLung technology has made energy-neutral wastewater a reality.

BY JEFF PEETERS

A MAJORITY OF the municipal wastewater treatment facilities that are in operation today were built before “going green” was a thing. Back then, treatment performance was a priority and energy efficiency—let alone energy neutrality—was not top of mind.

According to the U.S. EPA, community drinking water and publicly owned wastewater systems in the U.S. use 75 billion kWh of energy per year—as much as the pulp and paper and petroleum industries combined, or enough electricity to power 6.75 million homes. The EPA also identified energy as the second-highest budget item for municipal drinking water and wastewater facilities, after labour costs, with utilities spending about \$4 billion annually on energy. Energy consumption by drinking water and wastewater facilities can comprise 30 to 40 per cent of a municipality's total energy bill.

Because of rising energy costs, the idea of becoming energy efficient or energy neutral is gaining momentum. Due to growing populations, tightening environmental regulations, and the ever-increasing demand and cost for electricity, the push to conserve energy is strong, prompting wastewater treatment facilities to thoroughly review operations. Energy neutrality is an option because the amount of energy present in wastewater is two-to-four times the amount that is required to treat it. The challenge is reducing the energy consumed in treatment and harnessing the energy in a manner that's reliable, efficient, and cost-effective for both new and existing facilities.

In Oakville, Ont., GE Water & Process Technologies has been leading the effort to enable energy neutral wastewater treatment. One area of focus has been biological treatment, a critical process that removes nutrients and organics from sewage. Bacteria metabolize these nutrients and organics during secondary treatment with the help of oxygen, which is typically pumped through diffusers to create bubbles. The process requires more than half of the energy demand in wastewater treatment, but with most of the oxygen rising to the surface unused, most of that energy is wasted.

A leap forward in wastewater treatment

Recognizing this as an opportunity, GE's Oakville team, along with their colleagues in Europe, set out to create a more efficient way to transfer oxygen. The solution replaces conventional bubble aeration with a membrane that delivers oxygen to a biofilm by diffusion. Oxygen is transferred without bubbles through a gas-transfer membrane, which favours the establishment of a nitrifying biofilm. The technology, a new hybrid membrane-aerated biofilm reactor (MABR) known as ZeeLung, operates in a high mixed liquor suspended solids (MLSS) environment, making it suitable for use in a conventional activated sludge process.

All photos: GE Water & Process Technologies

Utilities are facing a growing challenge of meeting more stringent discharge regulations. While the industry has solutions for addressing this challenge, they typically involve increasing the complexity and energy demand of treatment plants. This pattern is not sustainable, particularly in a world with increasing energy costs and attention to reducing greenhouse gas emissions. ZeeLung's MABR technology is an innovative solution that allows utilities to upgrade existing facilities to meet more stringent discharge regulations while significantly reducing the energy used for treatment.

The building block of the new ZeeLung MABR is a flexible, yet unbreakable "cord" that is constructed of dense-wall, oxygen-permeable hollow fiber membranes distributed around the circumference of a yarn reinforcement core. Multiple cords are potted into top and bottom headers to create a module. The top header delivers and distributes air to the inside of the fiber lumens and exhaust gas is collected in the bottom header. Modules are installed in cassettes for deployment in biological reactors. Reactor mixing and biofilm thickness control is provided with minimal energy input by a coarse bubble aeration system integrated into the ZeeLung cassette.

In addition to reducing energy consumption, ZeeLung MABR improves capacity for nutrient removal or expansion in existing tank volumes. The biofilm that is supported on the ZeeLung membrane increases the inventory of bacteria in the bioreactor, enabling increased treatment performance. This allows utilities to avoid the need to build new bioreactor volume, thus saving plant footprint and capex.

Partnering for success

GE operates a research facility at the Environment Canada Wastewater Technology Centre in Burlington, Ont. This facility plays an important role in the development of new technologies as it allows testing of new products and processes in real wastewater conditions. In partnership with teams in the U.S., the U.K., and Hungary, GE's Oakville team designed and fabricated a

ZeeLung MABR system for pilot testing at the Wastewater Technology Centre. The study mirrored a full-scale plant and proved that GE's ZeeLung MABR concept was indeed a viable solution for improving nutrient removal in a small plant footprint while significantly reducing energy consumption compared to conventional treatment.

ZeeLung MABR is an ultra-low energy biological treatment process, and just one of the fundamental components for energy neutral wastewater treatment that GE provides a solution for. The other three components include:

● **Enhanced primary treatment:**

Considerable energy is needed to treat suspended organics. By shunting them away from biological secondary treatment to sludge treatment, facilities reduce consumption while increasing energy production.

● **Advanced anaerobic digestion:**

The organics shunted from the biological treatment are processed through advanced anaerobic digestion, converting sludge into biogas that can then be converted to electricity while producing biosolids for agriculture or other beneficial use.

● **Energy recovery:**

Biogas produced during advanced anaerobic digestion is converted into electricity and heat by gas engines or recovered as natural gas.

The future looks bright

Looking ahead, the GE Oakville team will continue to commercialize the technology by incorporating ZeeLung into both greenfield and retrofit applications. The overall goal is to ensure wastewater treatment plants can accommodate increasing demand and more stringent effluent requirements with a simple, low-energy solution that supports the move to energy neutral operations. WC



Jeff Peeters is a senior product manager with GE Water & Process Technologies.

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CREATE A WATER REGULATOR FOR ONTARIO: REPORT

A five-metre deep sinkhole that opened up in downtown Ottawa in early June as construction crews worked on the city's new LRT tunnel.

New report urges Ontario to adopt a water board.

BY JEFF SANFORD

ONTARIO POLITICIANS and members of the water infrastructure construction industry gathered at the provincial legislative in mid-May to celebrate the release of a major new report on water infrastructure, *Bringing Sustainability to Ontario's Water Systems*.

The report, published by the Ontario

Sewer & Watermain Construction Association (OSWCA), was the topic of conversation at Queen's Park recently as members of the OSWCA spent a day at the legislature in Toronto meeting with Ontario politicians, talking up the report and attending a reception in the MPPs dining room. Executive director of the

OSWCA, Giovanni Cautillo, focused on the central concern: the need for the government to create a provincial water regulator authority in the province.

"One of the key items we're calling for is a regulatory board in the water sector like the Ontario Energy Board," said Cautillo. "Our population is growing. It's

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time we had an Ontario Water Board in this province.”

Having a province-wide organization dedicated to coordinating water infrastructure projects would be a big step forward in terms of updating and modernizing the funding environment around water projects in Ontario. The report suggested the creation of an Ontario Water Board (OWB) could eventually lead to a provincial-wide management system that was based on existing natural watersheds rather than the current municipal boundary-based system. “We have to look at water on a regional and watershed basis. Having a water regulatory body at the provincial level would allow a coordinated approach to infrastructure. You need to have a plan. You can’t have one municipality working against another. We need planned maintenance,” Cautillo said.

The report also recommend that the government include a dedicated line item in the Ontario budget to consolidate water sector revenues into a single category. Creating a single budget entry separating funds for water-related projects out of other government funds would represent another important step toward in terms of providing so-called ‘full recovery’ in the Ontario water sector. “We need to know that funds from water bills are directed back into water systems rather than being diverted into other government programs. We need this as a line item in the Ontario budget,” said Cautillo. “A line item is the easiest fix.”

The report updates one released 25 years ago by the OSWCA. That document, the so-called Fortin-Mitchell

report, contained a recommendation that metering be extended to all Ontario homes. The good news is that the policy recommendation has been achieved, with metering now “nearly universal, having gone from 81 per cent in 1991 to 98 per cent by 2009” in the province.

A white paper released in conjunction with the report suggested the creation of Ontario Water Board (OWB) would also allow for more robust form of full cost accounting around water systems. “Most Ontario municipalities can claim that they are at or approaching full-cost pricing,” according to the report. However, these municipalities only do so by overlooking other important factors such depreciation, upgrades to existing systems and expanded resilience features. As a result, there there is still a “considerable distance to travel” to achieve true full-cost accounting. The creation of an OWB, would help achieve that as the mandate of the organization would be to “analyze and rule on municipal water service business plans and asset management plans,” as well as to set municipal water rates to represent the true cost of providing water according to the documents.

According to one of the authors of the report, Harry Kitchen, a professor emeritus at Trent University, municipalities need to charge a more realistic price for water. “If there is one thing I’d like to leave it’s that, we need a better price for water,” said Kitchen. “It’s always a tough proposition for municipal politicians, but ‘If you don’t charge for water, why should we give you infrastructure?’ It’s a scarce resource and

we’re underpricing it.”

As water issues continue to crop up in the news Cautillo says the issue of water continues to be on the mind of many. He points out the benefit to a politician that backs the recommendations. According to Cautillo its an obvious policy choice, as voters will be glad to see politicians taking a proactive approach on water issues. “I tell politicians, ‘Tell the public about this. Advertise this.’ Tell them, ‘Look, we’re doing something about this,’” said Cautillo. “You can get people to rally around this issue.” WC



Jeff Sanford is a freelance journalist in Toronto.



The OSWCA represents over 700 companies and up to 10,000 employees during the peak of construction season.

The full text of the report can be found at bit.ly/OSWCA2016WaterStudy

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Embracing a more holistic, decentralized approach to water management

BY DENNIS F. HALLAHAN

HISTORICALLY, the evolution of drinking water and wastewater management has shifted towards a centralized scheme because of urbanization and the concentration of pollutants. Centralization became the norm and the public perception that followed deemed centralized management as superior. The push for centralized infrastructure through the 1900s and the lack of maintenance thereafter has led to the current state of degrading and dated infrastructure. This has become too much of a financial burden for budget-strapped communities and detrimental to environmental and human health. If we are to adapt in a sustainable fashion, we need a change in perspective.

Some communities are turning to public-private partnerships (P3s) to finance necessary infrastructure improvements, but this approach is not widespread due to local constituent's resistance to private sector involvement in public water projects. In the recently released 2016 budget, the Canadian government earmarked \$5 billion for water, wastewater, and green infrastructure projects including \$2

billion over four years for a Clean Water and Wastewater Fund. The budget notes that there is an "urgent need" to modernize water and wastewater infrastructure and to build partnerships.

The need is also clearly identified, as the Environment and Climate Change Canada (ECCC) has estimated that approximately 150 billion litres of untreated or undertreated wastewater flows into Canadian surface waters from centralized sewers, making sewers the number one polluter of Canadian surface waters. Comparatively, an estimated 20,000 replacement septic systems are installed yearly nation-wide, the flow of which would amount to approximately 0.03 per cent of the untreated wastewater discharged by sewers to Canadian surface waters.

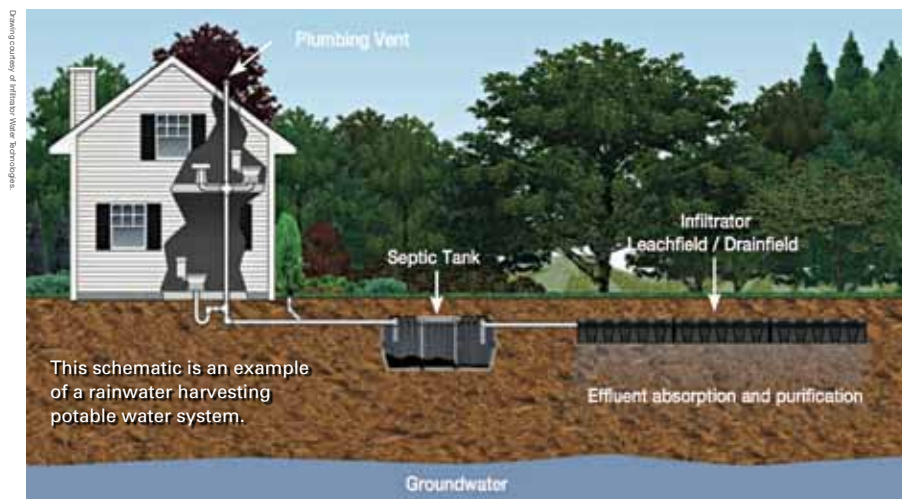
Progress in solutions

There are a growing number of design options within the decentralized industry to provide differing levels of treatment and a move towards clustered systems. Clustered systems keep treatment and groundwater recharge localized, while still providing opportunity for third-

party operation, maintenance, and management. Yet zoning and regulations tend to favour centralized infrastructure. Homeowners and developers need to educate and lobby for improved decentralized regulations. Communities should be able to make a choice to move past the stigma of onsite systems and focus on the environmental and fiscal sustainability of decentralized wastewater management.

One of the holistic approaches is to embrace water reuse, even with wastewater. For example the technologies are available to and treat wastewater to the necessary standards prior to reuse. Irrigation for landscaping may require lower levels of treatment whereas reuse for non-potable indoor uses such as toilet flushing or cooling would necessitate treatment. This is where the fundamental shift of thinking can occur; in lieu of disposing wastewater by dumping to a river or sea, the water is reused, thereby decreasing the demand upon potable water sources.

Both public stigma and regulations can be barriers to the acceptance of water reuse. The perception of using



wastewater as a potable water source seems unnerving and dangerous without proper education; in reality—we are continuously reusing water/wastewater. In fact, all municipal water systems that draw water downstream from a wastewater treatment plant are implementing de-facto water reuse. Decentralized water reuse simply offers

a more direct and sustainable practice.

A still largely untapped water source is rainwater. From small residential rainwater harvesting systems to those designed for large-scale commercial applications, the technology in components, filtration, and controls is propelling this water supply alternative to the forefront. With little treatment,

rainwater can be used for irrigation, toilet flushing, and cooling. With further treatment, rainwater becomes viable as a source of a potable water supply.

As populations continue to grow and shift, it is imperative for all aspects of the water cycle to be optimized for sustainability. Receptivity to new approaches to finance these infrastructure improvements is critical for communities to move ahead with safe and sound water and wastewater infrastructure programs. Implementing next generation decentralized wastewater treatment, water reuse, and rainwater harvesting approaches are three potential solutions to move toward a dependable, safe and sustainable water cycle. Water is required for life; let's treat it as such. **WC**



Dennis F. Hallahan is a technical director for Infiltrator Water Technologies.

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Double Up

Canada's infrastructure future should include asset
management and levers for innovation.

BY ROBERT HALLER

THE TWO KEY ELEMENTS for us to successfully address our infrastructure challenges are asset management and innovation. We need municipal financial planning and we need immediate financial supports from upper levels; but even when money is not a concern, we need to approach this properly. As professionals, we want to commit the "right funds to the right project at the right time," as they say. And we want to do so using the best and most practical technologies available. The new federal budget seems to share these same elements, identifying asset management and Canadian innovation as major goals. Those of us in the water utility sector are anxious to see how these funds will roll out and how the process will work.

The funds are there. We see a commitment to \$20 billion for green infrastructure, including the Canadian Water and Wastewater Fund. In reality this is an even greater investment as federal contributions are matched by provincial and local governments. A total of \$50 million has been allocated directly for community capacity-building to support the use of asset management best practices. This is critical support for small and medium-sized municipalities in need of adaptable templates and affordable solutions. We are excited to work with the Federation of Canadian Municipalities (FCM) and other municipal associations on how this program might roll out.

This federal budget is clearly

about more than just passing down infrastructure funding. The government has set targets for addressing climate change and for stimulating the Canadian economy, and this funding is a way to move us toward those targets. To achieve local goals, you must also

How can the government encourage municipalities to consider new innovation and select alternate solutions?

show how you are contributing to these national goals. There is renewed support for the FCM's Green Municipal Fund (\$125 million) and another fund (\$75 million) specifically for municipal projects addressing climate change. Most exciting is the commitment to innovation and advancing the Canadian innovative economy.

How can the government encourage municipalities to consider new innovation and select alternate solutions? The advancement of Canadian innovation won't happen on its own. There will need to be systematic changes to lead communities down this road. The consideration of innovation will need to be a requisite for any application for federal funding. This might start with a review of all grant applications by the Ministry of Innovation,

Science and Economic Development to refer this to Canadian firms; demanding that the local procurement process be forcibly opened to accept innovative bids. For many years, pre-selection of the same old technology has excluded Canadian innovators from even getting a foot in the door.

We are seeing many more municipalities using output-based procurement—defining the end product or solution and accepting any technology that can meet provincial and federal requirements. This may need to be a requisite of the grant application.

If our industry truly embraces this openness to innovation, I know we will be pleasantly surprised with the solutions that are proposed. wc



Robert Haller is the executive director of the Canadian Water and Wastewater Association.



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APPOINTED



Carl
Bodimeade

Carl Bodimeade has been appointed a Senior VP at Hatch Infrastructure. The move reflects a division within the company, effective April 26, whereby Hatch Mott MacDonald separated into two independent and unaffiliated businesses. In this new role, Bodimeade is responsible for strategy and business development. His responsibilities in that role include working with clients and project teams to achieve project expectations for cost, schedule, scope and community benefits; assisting clients in liaising and coordinating with key project stakeholders; and business unit strategy.

HIRED

The Faculty of Environment at Simon Fraser University is pleased to announce that Dr. **Zafar Adeel** will join SFU on July 1 as executive director of The Pacific Water Research Centre. Adeel



Dr. Zafar
Adeel

is an environmental engineer with a PhD from Carnegie Mellon University. In this role, he will be responsible for the overall leadership, strategic planning and management, research, teaching, networking, and community engagement and communications. Adeel is also facilitating the development of a research partnership between SFU and the University of Utah. Dr. Adeel brings a wealth of experience in global and Canadian water challenges, having served for ten years as Director of the Hamilton, Ont.-based United Nations University Institute for Water, Environment and Health. An environmental engineer by training, he chaired UN-Water from 2010-2012, coordinating the water-related work of 30 United Nations bodies and over 35 international water organizations.

Nineteen-year-old **Quentin Rae** has been hired as the new operator-in-training at the North Spirit Lake First

Nation water treatment plant. North Spirit Lake is 800 kilometres northwest of Thunder Bay. Quentin graduated from high school last year, which made him eligible to become an operator-in-training. When Quentin finishes his first level of certification, the boil water advisory in North Spirit Lake can be lifted. The initiative was funded as a pilot project in 2015. Since then, three of the First Nations involved have been able to lift their boil water advisories.

AWARDED

The boutique environmental consultancy Hemmera was recognized by Mediacorp Canada Inc. as one of Canada's Top Small and Medium Employers of 2016. This annual competition recognizes the nation's best places to work—small and medium enterprises (SME) that lead their industries in attracting and retaining employees through forward-thinking human resources policies.

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Understanding vulnerability within the water sector: Enabling Resilience

Integrating Climate Risk into Infrastructure Management

Credit: Sarah Pothoven/Water Canada



Minister Sohi connects with a young professional after his closing keynote.



Mary Jane Loustel, IBM's national aboriginal program executive.



Hein Molekamp from the Water Alliance shares his watermark story with the Lake Ontario Waterkeepers.



Consul General to the Netherlands in Toronto, Anne Van Leeuwen; Blue Events' Todd Latham; Emmy Scholten, Consulate of the Netherlands.



Morning plenary panel on "big picture water issues" with (L-R) Peter Nicol, Alex van der Helm, Jonathan Radtke, Matthew Howard, Dianne Dillon-Ridgley.



Breakout session on multi-sectoral partnerships; (L-R) Lindsay Telfer, Elizabeth Thelan.

Canadian Water Summit Toronto, ON

With a focus on the "Business of Water Infrastructure Across the Entire Lifecycle of Water Use," the 2016 Canadian Water Summit hosted close to 230 business, clean-tech, government, and non-government leaders. The 7th annual event engaged "non-traditional" actors to advance discussions around innovation, leadership, and water resilience; including craft brew masters, airport managers, corporate aboriginal executives, and venture capitalists.

Prior to the big event, Water Canada hosted a roundtable with the Toronto Region Board of Trade to discuss corporate water risks and what businesses can do to get ahead of them. That evening, gold sponsor Toronto Region Conservation Authority hosted a networking mixer at a local pub for young professionals that was well attended.

On June 23, the 2016 chair of the water Summit, **Brenda Lucas**, welcomed guests and Ontario Minister of the Environment and Climate Change **Glen Murray**. Minister Murray delivered an impassioned opening keynote address to kick off the morning, followed by the morning plenary with **Dianne Dillon-Ridgley**, **Matt Howard**, **Jonathan Radtke**, **Alex van der Helm**, and **Peter Nicol**, who explored the global issues and trends that are driving the "3.0" in

advanced water management. "We've gone from trying to manage nature, to partnering with it," said Nicol, the global water business group president for CH2M. The following plenary led by WaterTAP's **Peter Gallant** featured an "electrifying" discussion with Real Tech Inc.'s **Jodi Glover** on the business lifecycle for clean-tech entrepreneurs, WatrHub's **Sunit Mohindroo**, and **Usha Srinivasan** from MaRS.

U.S. Consul General **Juan Alsace** described the importance of water to Canada-U.S. relations before introducing *Globe and Mail* columnist **Roy MacGregor**. MacGregor stirred a few laughs and inspired exploration with his luncheon keynote about his experiences with former Prime Minister Stephen Harper and time spent researching an ongoing Canadian rivers project.

The afternoon breakout sessions addressed sector-specific challenges and opportunities related to issues such as food and beverage wastewater management, sustainable infrastructure finance, and challenges in cross-sector collaboration. Highlights included a frank conversation about the federal government objectives with respect to water infrastructure and climate change with parliamentary secretary for the Ministry of Environment and Climate

Change **Jonathan Wilkinson**; and a powerful reminder of water's spirit by IBM's national aboriginal program leader **Mary Jane Loustel**.

While sessions and networking breaks went on, Canadian and Dutch businesses met in an adjacent room to explore synergies and opportunities for partnerships in the Dutch B2B sessions organized by the Consulate of the Kingdom of Netherlands.

The event ended with a heartfelt and poetic story from federal minister of Infrastructure and Community, the Hon. **Amarjeet Sohi**. Sohi described his personal experience immigrating with his family to Canada from Banbhaura, India—where access to clean water is not taken for granted—and working as a bus driver for many years before his foray into politics. He said, "Ask any immigrant to Canada, and they will tell you that our infrastructure has helped them reach their full potential."

Finally, the week concluded with three intimate field trips—two kayak tours of Lake Ontario to view plans to move and restore the mouth of the Don River and a green infrastructure and urban renewal tour of sites that TRCA has developed in the city. The organizers have set June 22, 2017 as the date for the 2017 Water Summit in Toronto.

Credit: Evan Kivimä

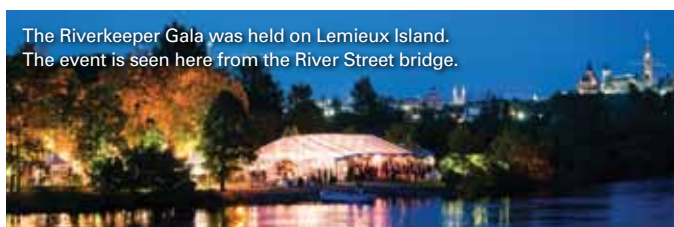


AJ Leitch accepts an award on behalf of Aquatic Informatics for its AQUARIUS technology, winner of the Technology-Water Resources category, with Kevin Jones from BLOOM presenting.



(L-R) Jim Shubat, founder and CTO, Jay Whiteside, COO, Els Vanbeckevoort, founder and CEO, Delilah Snook, Sunnyside, NL, Mayor Robert Snook, Sunnyside, NL, Dr. Colin Guthrie, business development manager, Robert Tyssen, project development manager.

Credit: Martin Lipman



The Riverkeeper Gala was held on Lemieux Island. The event is seen here from the River Street bridge.



2016 Honorary Riverkeeper Sophie Grégoire Trudeau, left, shares a laugh with Catherine McKenna, Minister of Environment and Climate Change.



Ottawa Riverkeeper Meredith Brown, left, and Sean Finn, executive VP of corporate services and chief legal officer of CN Railway. CN Railway was the Chairman's Reception sponsor for the Riverkeeper Gala.

Ottawa Riverkeeper Ottawa, ON

On June 1, over 400 river lovers descended on the grounds of the Lemieux Island Water Purification Plant to celebrate the Ottawa Riverkeeper Gala. And while it may be difficult to envision a wastewater treatment plant as magical, the setting—surrounded on all sides by the river—aglow with candles, chandeliers, and hanging lights was certainly that. The dress code for the evening was “river chic.” Former CBC broadcaster **Evan Solomon** was the master of ceremonies, and Minister of Environment and Climate Change **Catherine McKenna** an honoured guest. Both the Riverkeeper, Meredith Brown and new executive director, Patrick Nadeau explained the mission of the organization. Madame **Sophie Grégoire Trudeau** was presented a handcrafted paddle as the 2016 Honorary Riverkeeper. She gave a moving speech on the healing power of water and the importance of the natural world in raising a family. Mayor **Jim Watson** was the recipient of the 2016 Water Leader award. Watson expressed his commitment to ensuring a swimmable, drinkable, fishable Ottawa River for generations to come. **Louise Summers** of RBC presented Ottawa Riverkeeper with a Blue Water Leadership Award totalling \$100,000 to support the organization's programs. The night capped off with a performance by Canadian singer and musician **Serena Ryder**.

Water's Next Gala Toronto, ON

It was a festive celebration of water leadership and innovation. On June 23, following the Water Summit, Water Canada celebrated its 2016 Water's Next winners and nominees at a gala awards ceremony in Toronto. The Water's Next Award program is the only national awards program to honour leadership across the entire water sector—including public servants, non-governmental groups, researchers, municipalities, and technology providers. Since 2010, Water Canada has hosted the awards to help strengthen and celebrate the thriving national community by showcasing Canada's water leaders, champions, and innovators. With 45 submissions and nine award categories, the winners were announced on June 23 at the Water's Next Award's Dinner. *See page 18 to read about the winners and visit watersnext.ca to submit your nominations for 2017.*



CWN CEO
Bernadette Conant.



Nancy
Kodousek



Lou Di
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Blue Cities Toronto, ON

On May 18 and 19, over 150 change makers and senior leaders in water management attended the Blue Cities conference. This event is focused on finding solutions to water management challenges and identifying opportunities for innovation in order to increase resiliency in Canadian cities. “Blue Cities is about getting the right people in the room together to have strategic conversations about municipal water issues,” said **Bernadette Conant**, CEO of Canadian Water Network. The program focused on themes of extreme weather and resilience, maximizing taxpayers' investments, asset management, and communications. Mayor **Berry Urbanovic** of the City of Kitchener and Mayor **Keith Hobbs** of the City of Thunder Bay participated in the morning panel. The afternoon sessions featured **Michael D'Andrea**, City of Toronto; **Carl Yates** of Halifax Water; and **Nancy Kodousek** from the Region of Waterloo.

Window on Ottawa Ottawa, ON

The Window on Ottawa is Canadian Water and Wastewater Association's core event featuring presentations from federal departments and national organizations on new initiatives and regulatory developments on a national level. Intimate by design, Window on Ottawa offers delegates a chance to interact with the senior government officials developing policies and programs that will impact operations. The conversations delved into the specific challenges faced by municipalities and water operators in relation to provincial and federal regulations; as well as highlighting emerging concerns such as cyber attacks, and opportunities like the forthcoming Water and Wastewater Funds. The organizers also presented several awards; and MP **Francis Scarpaleggia** delivered a keynote address following the dinner, describing his longstanding interest and commitment to water issues and the knowledge and value he has gained from such events.



Glen R. Murray, MPP, speaking to over 100 delegates.



Busy trade show floor, featuring 17 manufacturing, educational and product booths.

Grey To Green Conference Toronto, ON

The Grey To Green Conference, held in Toronto, brought together green infrastructure professionals for two full days in June. Technical sessions and keynote speakers, including **Glen Murray**, MPP, focused on the importance of recognizing, protecting and managing green infrastructure and its irreplaceable role in mitigating against and adapting to climate change.

New this year, Grey To Green ran a Low Impact Development (LID) course in partnership with Credit Valley Conservation which described how to properly construct LID projects that can treat and manage stormwater runoff.

On June 2nd, a networking event took place at Waterfront Toronto with old friends and new colleagues. And, on June 4th, conference delegates toured Toronto's most innovative green infrastructure projects, including the University of Toronto's GRIT Lab, Ryerson University's quarter-acre rooftop farm, the former Pan Am Village and the iconic Waterfront Sugar Beach and Sherbourne Common.

canadian 7th Annual water summit 2016

(L-R) Usha Srinivasan, Jodi Glover, Peter Gallant, Sunit Mohindroo



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New Brunswick's new water strategy is an opportunity enshrine best practices.

BY STEPHANIE MERRILL

IN THE DECEMBER SPEECH from the Throne, New Brunswick Premier Brian Gallant announced that the Department of Environment and Local Government “will begin in partnership with stakeholders and communities to develop a provincial water strategy. The water strategy is a comprehensive approach to managing New Brunswick’s surface and ground water resources to ensure quality and availability for people, nature and the economy, now and into the future.”

The news was welcomed, since New Brunswick is one of the last provinces to develop an overarching water strategy to guide its protection and use. Many organizations and environmental policy leaders in the province had been calling for one for many years.

In the early 2000s, New Brunswick was a leader in watershed management in Canada, especially in source water protection. Following the Walkerton tragedy in Ontario, the New Brunswick government was called upon for advice regarding water regulatory reform, but the province has since fallen behind. Many well-intentioned water protection discussions have been thought through, including a water quality classification program, wetland conservation policy, coastal areas protection policy, and a flood risk reduction strategy, however none of these have yet been implemented. The

good news is that when you are the last out of the gate, there is a fantastic opportunity to learn from, and build on, the work done elsewhere and to come out on top.

This water strategy could be the umbrella that brings together the existing good work done by New Brunswick government departments, such as enforcing the much anticipated Water Classification Regulation under the *Clean Water Act*, and the best from other jurisdictions, especially British Columbia, Northwest Territories, and Prince Edward Island, who all have relatively new water strategies and associated legislation.

While the water strategy development process is still in its infancy, the discussion document released in February has the potential to be a strong backbone. The vision is strongly worded and inclusive of people and nature; the guiding principles are rooted in science, conservation, and watersheds as natural management boundaries. The document also acknowledged the importance of the capacity built and role to be played particularly by community-based organizations.

Notable weaknesses of the document include its intentions around precaution and pollution prevention before water quality issues arise and indications of if or how the strategy will be incorporated into modern legal framework. The last

thing we need is another strategy on the shelf, and there is little public appetite for lip service to water protection and meaningless public consultation.

That was evidenced by the fact that public concern about the intent of the water strategy initiative dominated once the discussion document was released and public open houses were held in April. The province’s recent history on developing meaningful water policy and legislation has left much to be desired. There is a particularly bad taste lingering over its aforementioned 13-year ill-attempt to enforce the water classification program.

With public trust in the gutter, the initiative has a rare opportunity to make amends.

After a lot more work ahead with advice from scientists and policy experts, public discussions and input including First Nations communities, and strong political will still needed to make this a gold-standard strategy, New Brunswick should be back as a water protection leader again soon. **WC**

Stephanie Merrill is the director of the Freshwater Protection Program at the Conservation Council of New Brunswick (currently on a leave of absence), the province’s longest-running environmental charity.



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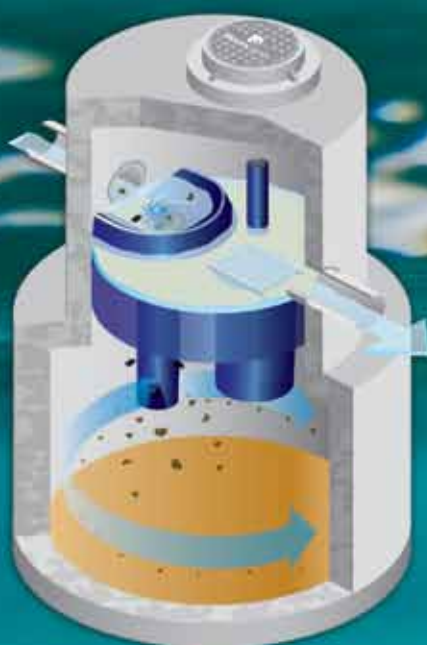
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