

GO with THE FLOW

THE OFFICIAL PUBLICATION OF THE ATLANTIC CANADA WATER AND WASTEWATER ASSOCIATION



ROV INSPECTIONS

INSIDE:

- Sewer Blockages Caused by Flushables Are the Last Thing We Need
- Natural Treatment Systems

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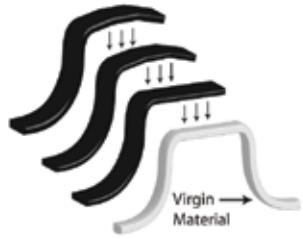


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GO with THE FLOW

FALL 2020



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On the cover: Shoreline of a rocky beach in Nova Scotia. | dreamstime.com



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Thanks, training options & a 2020 virtual conference

I hope you have enjoyed the great weather we've experienced during the summer in the Atlantic Canada COVID bubble and that you are having a great start to the fall season. This is my last message for *Go With the Flow* as Chair of ACWWA – the time has flown by. Thank you for the opportunity to serve as the Association Chair.

While the year was different than what I had envisioned it to be pre-COVID-19, as an Association we have made adjustments and we are adapting to the new norm.

While the ACWWA Board of Directors earlier this year made the difficult but necessary decision to cancel the ACWWA Annual Conference in Fredericton, NB, we have also been discussing and visualizing what a 2020 ACWWA virtual conference would look like and you will soon be hearing more about that along with the dates. There will be a keynote speaker and technical sessions, the AGM will be virtual, and there will be sponsorship opportunities to support this move to a 2020 virtual conference.

As we all prepare for a second wave of COVID-19, it is important that each of us and our team members, as essential service providers, continue to follow all of the recommended safety precautions so that we remain healthy through this pandemic and that we ensure our communities continue to receive the services that so many count on us to provide.

I am very pleased to say that after a significant undertaking, Maintenance Training Systems Inc. (MTS) has delivered the final course materials. The Association now has ACWWA course manuals, slides, and teaching material for Water Distribution 1-2, Water Treatment 1-2, Wastewater Treatment 1-2, and Wastewater Collection 1-2. Thank you to MTS, Lorne Johanson, our Executive Director Clara Shea, and all others who have been involved in this project for your outstanding contributions to producing high-quality ACWWA course materials and for your lasting contribution to the water and wastewater industry in Atlantic Canada. I encourage all of our members to take some time to review online the course offerings and to sign up, as there is something for everyone.

Please take some time to enjoy the Fall 2020 edition of our magazine – *Go With the Flow* – and I encourage each of you to keep an eye out for details on the 2020 ACWWA virtual conference that will be held in November 2020.

If you have any ACWWA virtual conference ideas or suggestions, please feel free to contact me at brent.mcgovern@saintjohn.ca. This Association exists because of the many tireless volunteers we have and I would like to say a sincere thank you to each of them for all they do. If you would like to know more about becoming a volunteer or the opportunities that are available, please reach out.

I look forward to seeing each of you virtually at our 2020 ACWWA conference. Until then, keep well. 



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Meeting the challenges together

Welcome to the Fall 2020 issue of ACWWA's Go With the Flow magazine. This is my first opportunity to report to you as the new AWWA Director for the Atlantic Canada Section. It is a real honour and privilege for me to serve our Section in this capacity. I will do my best to keep you informed and engaged in AWWA news and initiatives.

I would like to acknowledge our outgoing AWWA Director, Dr. Graham Gagnon. Graham served our Section as Director with distinction and he was, and continues to be, very helpful to me as we made the transition. Thank you, Graham, for your service to our Section. I appreciated the opportunity to learn from Graham at the AWWA winter Board meetings this past January in San Juan, Puerto Rico. Unfortunately, I think that is the last substantial 'in-person' meeting I attended before our world was changed with the onset of the COVID-19 pandemic. Who could have imagined at the turn of the calendar that AWWA ACE 2020 would be cancelled, along with virtually every other significant water industry event and education offering? The transition between outgoing and incoming Directors normally happens at ACE. Since that was not possible this year, AWWA has conducted several Board meetings via virtual platforms. Like many of you, navigating flight delays, hotel bookings, and arranging time away from work has now been replaced with ensuring the internet connections are adequate for the next Zoom, Teams, or GoTo webinar meeting.

"I am pleased to report that the AWWA Board recently unanimously adopted the new AWWA Strategic Plan, designed to align the organization's work with its strategic goals until 2025."

I had the privilege of attending the virtual Gavel Passing Ceremony held on June 30, where the outgoing AWWA President, Mr. Jim Williams, passed the gavel to AWWA's new President, Ms. Melissa Elliott of the Rocky Mountain Section in Colorado. Melissa assumes the AWWA presidency in challenging times, and I know we all wish her the best. While AWWA is a well-managed organization with a solid financial foundation from which to build, the effects of the pandemic on the Association's budget cannot yet be known. Staff have been hard at work trying to mitigate the impacts of the pandemic. I am confident that with the support of membership, the Association will navigate its way through these times. As a Board member, I look forward to contributing in whatever way I can in these efforts.

I will provide further details in a future issue, but for now, I am pleased to report that the AWWA Board recently unanimously adopted the new AWWA Strategic Plan, designed to align the organization's work with its strategic goals until 2025.

As someone who works for a water and wastewater utility, I know many of you have been met with some significant challenges since the onset of the pandemic. In communicating with friends and colleagues across Atlantic Canada, it gives me a lot of comfort to know that we are all doing our best to stay safe while focusing on our core missions, which is always to provide our customers with safe, clean, reliable drinking water along with the proper collection and treatment of wastewater, despite the challenges we all face. Together, we will get through this. I wish I could close by saying that I am looking forward to seeing you at the ACWWA Annual Conference in Fredericton this fall, but that too is not possible this year. I am looking forward to the 2021 ACWWA Conference in St. John's, NL.

I do want to thank you for the opportunity to serve our Section, and wish all of you good health. Please feel free to contact me with any AWWA-related questions or concerns at scott.grasman@fredericton.ca.

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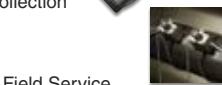
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Get ready for WEFTEC Connect

So, this is the new normal eh... 2020 will be a year to remember! Many of us have been working from home since the pandemic began. As of the end of August, while I am writing this, some of us are back in our offices with certain restrictions. Unfortunately, some may have experienced layoffs. Although the toilet paper panic seems to be under control, we have grown accustomed to maintaining six feet social distance spacing from others, waiting in lines to enter stores, using hand sanitizer like never before, waving and elbow bumps instead of shaking hands or exchanging a friendly hug. In-person meetings have been put on the back burner for the most part. Zoom meetings, MS Teams meetings, and other web-based video chat platforms seem to be an everyday occurrence.

Being a so-called "baby boomer," I looked forward to in-person, face-to-face meetings or phone calls instead of using emails or texts whenever possible. I often wondered why the younger generation spent so much time on their phones communicating via text, Snapchat, Facebook, Twitter, and other social media methods... who knew they were ahead of the curve and we would see this as an essential way of doing business. We all needed to think outside the box to come up with ways of conducting business. A simple task of going for a coffee and a sandwich took on a whole new world. One good thing is that my drive-thru purchases have gone down and I am eating a bit healthier.

Here we are today, all trying to remember to wear our face masks when we enter a public building space and not being able to go to live



www.weftec.org/attend/register/attendee-registration

concerts or music festivals. All the large trade shows and conferences were dropping like flies all over... such as the biggest... WEFTEC. Travel restrictions prevented normal travel anywhere except for local day trips. With all these restrictions in place, WEFTEC has been moved into a total virtual conference/trade show. You can register for WEFTEC Connect, which offers a lot of valuable training and networking opportunities. Visit the link below to learn more.

Have fun and get social at WEFTEC Connect!

Since we can't meet face to face this year, we are bringing fun and social engagement directly to you through WEFTEC Connect. Each day, we have something special planned, so check out the schedule below and gather with friends and colleagues to join in on the fun.

The world of water is gathering at WEFTEC Connect, and we don't want you to miss it. Register today!

Monday, October 5

Movie Night – Brave Blue World

6:00–7:30 p.m. EDT

Watch the 50-minute documentary with your family and friends, followed by a live panel discussion with Q&A text chat.

Tuesday, October 6

Trivia Night

6:00–7:00 p.m. EDT

Rather than meeting at a pub, gather with other attendees for a fun night of online video trivia! Play through three rounds of perfectly balanced, general knowledge questions and categories with an engaging host. Attendees in multiple cities, time zones, and countries can come together to play. Trivia Night is an add-on to your WEFTEC Connect registration.

Please note: To participate in the WEFTEC Connect Trivia Night you will need to create a free Zoom account.

Hosted by Trivia Hub – Ticketed event (\$25/person) with proceeds going to support the Hospitality Cares Pandemic Response Fund managed by the Louisiana Hospitality Foundation and The United Way of Southeast Louisiana.

Wednesday, October 7

WEF Awards & Celebration

Ceremony: 5:00–5:45 p.m. EDT | Celebration: 5:45–6:30 p.m. EDT
Celebrate and congratulate the 2020 WEF Award recipients and Fellows on their accomplishments. During the program, President Jackie Jarrell will share remarks and then “pass the gavel” to Incoming President Lynn Broaddus, who will share her vision for the coming year.

Happy Hour

6:00–7:00 p.m. EDT

Wrap up day three by gathering with fellow WEFTEC Connect attendees at the Wednesday Happy Hour. We are using a cool, new tool that allows you to join virtual “tables” based on similar interests and interact and meet one another via video.

Thursday, October 8

Operations Challenge Awards & Celebration

6:00–7:00 p.m.

Come celebrate and make some “virtual” noise for the achievements of our water heroes who competed all week in Operations Challenge competition. Learn more about the Operations Challenge at www.weftec.org/attend/operations-challenge.

Friday, October 9

It's a Wrap Party!

5:00–6:00 p.m. EDT

Take off your learning caps and put on your party hats! Wrap up WEFTEC Connect in true “New Orleans style” with good friends and good music from the Grammy Award-winning Rebirth Brass Band!

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"ACWWA has prepared many online solutions for you with some instructor-led courses as well as some pre-recorded courses that you can take anytime at your pace."

These are certainly challenging times for most of us as we are adapting to the new "normal" through the COVID pandemic. It has brought a whole new world of challenges to our workplaces as well as personal lives.

The success of the Atlantic Canada Water and Wastewater Association is greatly due to the network of members and volunteers it is comprised of. Through the pandemic, volunteers and our Executive Director kept working to ensure that our members continue to receive the

same benefits, that our courses and training continue, and networking opportunities are still available with possible virtual events being planned as networking is also important to our members.

Many companies today have to find more economical ways, due to the pandemic, to have staff training and continuing education. ACWWA has prepared many online solutions for you with some instructor-led courses as well as some pre-recorded courses that you can take anytime at your pace. Please visit acwwa.ca for the course schedule.

We also want to say thank you to all of our members who participated in our annual photo contest. We have some very talented and photogenic members. We are looking forward to sending you our Annual Calendar in November.

Our contest for referring a member continues with a chance to win a \$50 gift card of your choice.

If you have any questions about your membership, please do not hesitate to contact me at (506) 877-7702 or julie.stokes@moncton.ca.

Welcome new members

Heather	McGuire	Dalhousie University	AWWA/WEF
Tiannie	Paul	Dalhousie University	AWWA/WEF
Annie	Cormier	Dalhousie University	AWWA/WEF
Rebecca	Teddiman	NSCC	AWWA/WEF
Alicia	Fleming		AWWA/WEF
Alvine	Tchonlla		AWWA/WEF
Brandon	Maillet		AWWA
Said	Ghazal		AWWA
Denis	Robichaud	Town of Richibucto	AWWA
Martin	Earle	Dalhousie University	AWWA

As of August 19, 2020

Total AWWA active members: **416** Total AWWA late members: **21** Total active WEF members: **108**
Total WEF late members: **26**



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Winner of the **Silent Hero Award**, **Nigel Crouse**



- 1.** **Job title:** Supervisor, Mill Cove Water Pollution Control Centre.
- 2.** **Who do you work for?** Halifax Water.
- 3.** **Where do you currently live?** Tantallon, NS.
- 4.** **Where did you grow up?** Chester Basin, NS.
- 5.** **When I'm not working, I'm...** at the Chester golf course.
- 6.** **The accomplishment I'm most proud of is...** my two amazing daughters.
- 7.** **If you could go on a road trip with any one person (living or dead), who would it be and where would you go?** My father, with no destination in mind, just to chat.
- 8.** **What is your philosophy on life?** Treat others as you'd like to be treated.
- 9.** **Toughest thing about your job?** Time management. In such a dynamic industry you often find what you actually did, and what you had planned to do, can be two very different tasks.
- 10.** **When you were a kid, what did you want to be when you grew up?** A pro basketball player.
- 11.** **Last movie you saw?** Joker.
- 12.** **What music did you listen to this morning?** Country.
- 13.** **Favourite TV show?** Seinfeld.
- 14.** **What was the best gift you ever received?** My wife.
- 15.** **What's the most useless thing you ever purchased?** A Polaris side-by-side.
- 16.** **What is your greatest luxury?** Golfing at exclusive courses.
- 17.** **What's your favourite famous quote?** "You miss 100% of the shots you don't take." – Wayne Gretzky
- 18.** **Describe your perfect day.** An early morning round of golf followed by a day lounging at the lake.
- 19.** **What three objects would you rescue from your burning house?** Golf clubs, Mustang key, and McDavid jersey.
- 20.** **Who is the most influential person in your life?** My father.
- 21.** **What is your ideal vehicle?** Any Bugatti would be just fine.
- 22.** **How long have you been a member of ACWWA?** About 10 years. 



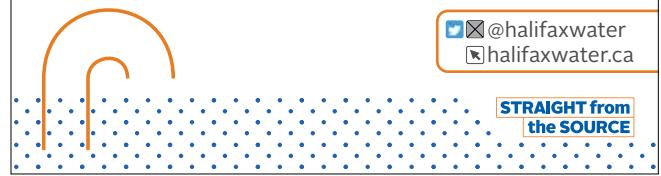
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ROV INSPECTIONS

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outine inspections are a critical component of predictive maintenance of any water storage tank. In the past, potable water storage tank inspections were arduous and sometimes dangerous tasks. There were only a couple of options for completing the job – sending a professional diver into the tank or emptying it for a dry inspection. Using a diver meant completely sanitizing equipment, and there is an inherent danger diving in an enclosed space. Emptying a tank for inspection meant up to a week or more of downtime, leading to potential problems if this was an only-source for potable or fire protection water. An offline, drained tank also presents a problem if issues are detected during inspection. Tank owners have to decide how to plan and schedule the repair. The tank could be left offline longer or filled and re-emptied later to facilitate necessary repairs. Due to these complications, municipalities would delay inspections, sometimes leading to undetected issues growing into more costly problems. Neglecting inspections can leave the build-up of sediments and contaminants unchecked inside the tank. This build-up can lead to corrosion, sacrificing a tank's integrity or, worse, fostering the growth of Legionella bacteria. A Legionella outbreak poses a serious health risk for a community reliant on a tank for drinking water.

ALONG COME ROVS

In recent years, ROVs have become a standard method for completing tank inspections. Remote Operated Vehicles, in the early days, were bulky, expensive, and lacked quality imaging options. As technology improved,

ROVs could be built smaller, to fit in water tank access hatches, and were easier for operators to maneuver. Camera and video technology improved, allowing HD imaging to stream directly to the operators' hand-held unit. Many of these units enable operators to make real-time voice notes during the inspection for reference and review later. Some ROV manufacturers offer a line of accessories that range from water sample collectors to LED lighting for low-light situations. These accessories give operators the option of more detailed inspections.

Built to withstand harsh water environments, ROVs generally require minimal maintenance.

However, the benefits of using an ROV for water tank inspections go beyond the technical basics of the unit. One of the most significant advantages of doing ROV inspections is that tanks can stay online during inspections. Draining, refilling, and recommissioning a potable water tank is costly, wasteful, and can disrupt water service for a surrounding community. Diver inspections require water to be super-chlorinated before the tank goes back in service, which adds additional downtime to the procedure. In cases where a fire water supply tank needs to be drained for inspection, this could mean putting a temporary tank online or risking going without protection during



the process. ROV equipment can generally be brought onsite in a small case by one operator, and an inspection can be completed in one day. As alluded to earlier in this article, issues discovered during an ROV inspection can be documented and strategically planned for when downtime would be less disruptive. This work is part of a complete predictive service plan an experienced tank inspection service can offer – the ability to help manage future maintenance expenses by predicting issues five or 10 years in advance. Another advantage of keeping a tank online during this process is the flexibility in scheduling when an inspection can be completed. Since there are fewer components to coordinate – it can be as easy as booking a day for the operator, equipment, and tank operator to be onsite.

An ROV and its components are easy to sanitize for use in potable water tanks. Proper sanitization allows operators to adhere to strict guidelines and best-practices during inspections. Professional, experienced tank inspection companies may even have an ROV dedicated to potable water tank inspections.

Once the ROV is sanitized, and in the tank, another set of benefits can be seen. With advancements in imaging, ROVs can record 4K high-definition video and capture close-up pictures. This advanced imaging can help service technicians and asset managers review inspection findings and plan for required maintenance. Operators can look at the interior coating and sealant and, in some cases, measure tank wall thickness. Any cracks forming in concrete tanks can be measured and documented. Corrosion forming in welded steel tanks can be brought to the tank owners' attention for tank repair or replacement consideration. Internal appurtenances, such as access ladders, overflow piping or inlets/outlets, can be inspected for loose fittings or corrosion. Another essential item to check during an inspection is the sediment build-up at the bottom of a tank. Sediment must be removed periodically to prevent the growth of bacteria, minimize corrosion, and reduce the risk of contaminants

mixing with the distribution system. A trained ROV operator can maneuver their machine close enough for proper assessment of sediment build-up without disturbing the silt during the process. In tanks where cathodic protection is installed, a detailed ROV inspection can help a NACE Certified service technician determine the condition of the protective anodes. All of this documentation can be referenced when making a strategic plan for future maintenance. It can also be useful in determining if necessary repairs to a tank are too costly, and replacing the tank may be a better solution. Often, the ongoing maintenance and repair costs associated with welded steel or concrete tanks are far more than replacing the tank with an Aquastore® glass-fused-to-steel tank.

CHOOSE THE RIGHT TEAM

It is recommended that most tanks be inspected every 3-5 years, depending on the type and age of your tank. Following a regular inspection schedule allows tank owners to

establish a predictive maintenance plan, which helps extend the life of a tank. Asset managers can use these plans to properly allocate budget money and resources for upcoming expenditures if necessary.

Choosing the right company for your tank inspections can be difficult; many companies offer ROV tank inspections. When deciding on a company, the most important consideration should be what service the company provides after the inspection. Any tank inspection service can show you video from inside your tank. Only a company that has experience building and servicing water storage tanks can advise on what to do about the issues discovered during the inspection. Water tanks are a little like cars; you wouldn't take your vehicle to someone to only diagnose the noise you hear under the hood. It's better to take it to a trained mechanic who can diagnose and properly repair the potential issue.

Finally, it's also essential to choose an ROV inspection team that is established and experienced and adheres to guidelines from the AWWA. The safety of your systems and people should be their top priority. ☺



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SEWER BLOCKAGES CAUSED BY FLUSHABLES ARE THE LAST THING WE NEED RIGHT NOW

BY ANUM KHAN

This article was originally published in the Summer 2020 issue of BCWWA's Watermark magazine. It is reprinted here with permission.

The COVID-19 pandemic has renewed an interest in rising concerns with products commonly labelled and marketed as 'flushable.' While some of these products, including baby wipes, cleaning wipes, facial tissue, paper towel and more, are often used in bathroom settings, wastewater utilities are reminding Canadians to dispose of these products in the trash can. Despite years of efforts to define the term 'flushable' in legislation, the fact is that these products continue to cause a number of reported operational problems in urban wastewater infrastructure.

Now, more than ever, wastewater officials are reporting an influx of consumer products labelled as 'flushable' in sewer lines, given that early March consisted of panic-buying and sold out toilet paper. With residents having no access to toilet paper, they quickly resorted to all kinds of wipes. Similarly, disinfecting wipes began gaining popularity across Canada and the rest of the globe as well, in an effort to combat the virus as a short-term measure.

Last year, researchers at Ryerson University delved into this issue further to explore how exactly these so-called 'flushable' products perform in water, under realistic conditions. The study, entitled Defining 'Flushability' for Sewer Use (www.ryerson.ca/content/dam/water/Research/FinalReport-FlushablesApril1.pdf) shows that out of 101 different products tested for 'flushability' using their disintegration capabilities, not a single one passed the test. The inventory of tested products included those commonly found on supermarket shelves and most widely used by the public. One other shocking part of the study found that even dog waste bags were labelled as 'flushable'!

The City of London sewer outreach and control inspector and co-author of the Ryerson report, Barry Orr, tells us that "wipes are the kryptonite of sewers." Today, we see countless items in wastewater that should not be flushed, including wipes, gloves, masks, feminine hygiene products, plastic applicators and more, says Orr.

HOW COVID-19 BRINGS IN AN INFUX OF 'FLUSHABLES'

During the coronavirus pandemic, water utilities in not only Canada, but around the globe, are putting together a number of educational outreach campaigns in an effort to



combat the rising number of sewer blockages resulting from 'flushable' consumer products. While the costs associated with each reported sewer blockage are hardly determinable, Jennifer Leno, chairperson of the Municipal Enforcement Sewer Use Group (MESUG) of Ontario estimates that 'flushable' wipes add at least \$250 million for taxpayers in additional repairs and maintenance each year to municipal sewer systems in Canada (2017). Throughout the COVID-19 pandemic, multiple reports are being streamlined across the globe discussing increases in 'fatbergs.' The 'fatbergs' described here are congealed masses of non-'flushable' materials that combine with cooking oils, fats, and greases, in sewer systems. In the United States, the Orange County Sanitation District recorded hundreds of 'de-ragging' maintenance calls in a single year and spent over \$300,000 having wipes removed (Porter, 2020). Further, New York City throws out a ballpark figure of \$18 million per year for extra disposal related to non-disposals going down the toilet (Porter, 2020). Countless other cities in the United States are facing the same issues. In late March, wastewater officials from Redding, CA, reported that the city's sewer lines became clogged by pieces of shredded T-shirts! The Miami-Dade Water and Sewer Department (WASD) staff have rising concerns since it has been reported that the County already pulls out 300 tonnes of wipes from pump stations and treatment each month (Brasileiro, 2020). In Australia, Sydney Water reports a 22% increase in blockages caused by a rise in 'flushable' consumer products being disposed of using the toilet. The apparent cost of removing these blockages from Sydney sewers is up to AUS \$8 million annually.

Although the rising trend in wipes' usage is directly proportional to the costs of repairing damaged infrastructure from these wipes, measures that are taken to combat the issue of gross solids are highly reactive. Following the

"DURING THE CORONAVIRUS PANDEMIC, WATER UTILITIES IN NOT ONLY CANADA, BUT AROUND THE GLOBE, ARE PUTTING TOGETHER A NUMBER OF EDUCATIONAL OUTREACH CAMPAIGNS IN AN EFFORT TO COMBAT THE RISING NUMBER OF SEWER BLOCKAGES RESULTING FROM 'FLUSHABLE' CONSUMER PRODUCTS."

recommendations of Joksimovic et al. (2020), reviewing state-of-the-art image-based sensors to deploy in water and wastewater applications could be a sound method for proactively monitoring and mitigating the impacts of 'flushable' consumer products in urban sewerage systems.



FURTHER RESEARCH

The results of the Ryerson study have encouraged Anum Khan, MSc student in civil engineering at Ryerson University, to work with other academics and wastewater officials to develop a monitoring system that will appropriately detect and track 'flushables' in sewer systems. The system is currently in a proof-of-concept state.

The development of an artificial intelligence (AI)-based monitoring system could enable the early detection and identification of 'flushable' consumer products in sewerage systems in quasi real-time. In-sewer, wirelessly communicated images could be programmed to employ innovative processing algorithms to provide detailed information to sewer system managers, providing a low-cost solution that could be mass-deployed to gain a detailed understanding of the sources of 'flushable' products disposed via toilets. Such a system will enable utilities to proactively identify and target problematic serviced areas through a cloud-based application of the monitoring system. The development of such a monitoring system could conveniently apply existing mature technologies to look for optimal viewing conditions in sewer systems under a wide array of settings, informed by pre-existing knowledge. While transmittance of data from buried infrastructure could pose a minor challenge, nothing technologically unsurmountable is envisioned in this system. Risks associated during the development of this monitoring system could include slow computer processing speeds, poor image/video resolution and lighting malfunction during image/video acquisition.

Being self-isolated at home as per the government's orders means caring for the infrastructure you have control over. If you aren't able to leave your place of residence at the moment, then being stuck at home with a backed-up sewer line is the last thing you want right now. However, if these countless horror stories can't keep the public informed and away from flushing these products down the toilet, then a stricter call to action is needed by the government officials to define 'flushability' in legislation to avoid mislabelling of consumer products.

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AWWA/SWAN International Smart Water Symposium to proceed as virtual event Nov. 10–11

Source: awwa.org

To protect public health during the ongoing COVID-19 pandemic, the American Water Works Association (AWWA) and the Smart Water Networks Forum (SWAN) announced that the Nov. 10–11 AWWA | SWAN International Smart Water Symposium will proceed as a virtual event. Details related to this event are available on AWWA's Events and Education webpage.

"While our commitment to public health protection during the ongoing pandemic prevents us

from hosting the symposium in-person in Austin, Texas, AWWA and SWAN are excited that attendees will have the opportunity to explore the latest in smart water innovations using a first-rate virtual platform," said AWWA CEO David LaFrance. "A virtual event is a fitting way to deliver content on data-driven, digital solutions, and we look forward to an outstanding learning experience."

"In these critical times, there is a great desire to learn about the

latest smart water innovations and industry trends," said SWAN Executive Director Amir Cahn. "Following our successful SWAN 2020 Virtual Conference, we're excited to keep sharing new ideas and further engage with global leaders to advance the water sector."

AWWA offers resources to assist utilities in dealing with the challenges that arise during the COVID-19 pandemic at awwa.org/coronavirus.

New study estimates amount of plastic in Atlantic Ocean

By Simran Chattha

Source: watercanada.net

The mass of 'invisible' microplastics found in the upper waters of the Atlantic Ocean is approximately 12–21 million tonnes, according to a new study.

This figure is only for three of the most common types of plastic litter – polyethylene, polypropylene, and polystyrene – in a limited size range. Yet, the figure is comparable in magnitude to estimates of all plastic waste that has entered the Atlantic Ocean over the past 65 years: 17 million tonnes. This suggests that the supply of plastic to the ocean have been substantially underestimated.

"Previously, we couldn't balance the mass of floating plastic we observed with the mass we thought had entered the ocean since 1950," said Dr. Katsiaryna Pabortsava, biogeochemist at the National Oceanography Centre (NOC) who was the lead author of the study. "This is because earlier studies hadn't been measuring the concentrations of 'invisible' microplastic particles beneath the ocean surface. Our research is the first to have done this across the entire Atlantic, from the UK to the Falklands."

"If we assume that the concentration of microplastics we measured at around 200-metres

deep is representative of that in the water mass to the seafloor below with an average depth of about 3,000 metres, then the Atlantic Ocean might hold about 200 million tonnes of plastic litter in this limited polymer type and size category," added Richard Lampitt, a professor at NOC and co-author of the study. "This is much more than is thought to have been supplied."

Pabortsava and Lampitt collected their seawater samples during the 26th Atlantic Meridional Transect expedition that took place from September to November 2016. They filtered large volumes of seawater at three selected depths

in the top 200 metres and detected and identified plastic contaminants using state-of-the-art spectroscopic imaging technique.

"In order to determine the dangers of plastic contamination to the environment and to humans we need good estimates of the amount and characteristics of this

material, how it enters the ocean, how it degrades, and then how toxic it is at these concentrations," said Lampitt. "This paper demonstrates that scientists have had a totally inadequate understanding of even the simplest of these factors, how much is there, and it would seem our estimates of how much is dumped

into the ocean has been massively underestimated."

The study builds on the NOC's research into marine plastic contamination, which aims to better understand the magnitude and persistence of exposure to plastics and the potential harms it can cause.

Glace Bay, N.S. receives federal and provincial investment in water & wastewater systems

By Simran Chattha

Source: watercanada.net

Glace Bay, Nova Scotia has received federal and provincial funding to upgrade its water and wastewater systems.

"The upgrades to Glace Bay's water and wastewater systems will not only improve water quality, but keep our people working and improve road conditions," said Mike Kelloway, member of parliament for Cape Breton-Canso. "Our government is and will continue to invest in projects that improve drinking water, transportation, connectivity, and job creation."

The announcement was made by Mike Kelloway, member of parliament for Cape Breton-Canso, and Geoff MacLellan, minister of business and member of the legislative assembly for Glace Bay, and Cecil P. Clarke, mayor of Cape Breton Regional Municipality.

"Reliable infrastructure is the foundation for building strong, sustainable communities," said MacLellan. "We are pleased to fund this project that will provide increased

access to high-quality potable water and will improve the efficiency of the wastewater system ensuring

residents and businesses have the wastewater and water services they expect and depend on every day."



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The project involves installing a water distribution main. It also involves separating the combined sewer main to replace it with new sanitary and stormwater mains. The improvements to water and sewer systems on many streets in and around Glace Bay will improve the quality of services for residents and protect the environment.

"Good, clean water is essential, and this project helps us provide that to our citizens," said Clarke. "It also provides 11-kilometres of road rehabilitation, 3,000-metres of sidewalks, and 53 direct jobs for each year for the duration of the project."

"No other municipality in Nova Scotia has the high-priority regulatory wastewater obligations we do, so I

greatly appreciate the federal and provincial governments collaborating with us to achieve this positive change for CBRM Citizens," added Clarke.

The governments of Canada and Nova Scotia are each investing \$4 million in this project through the Rural and Northern Communities Infrastructure Stream (RNIS) of the Investing in Canada plan. 

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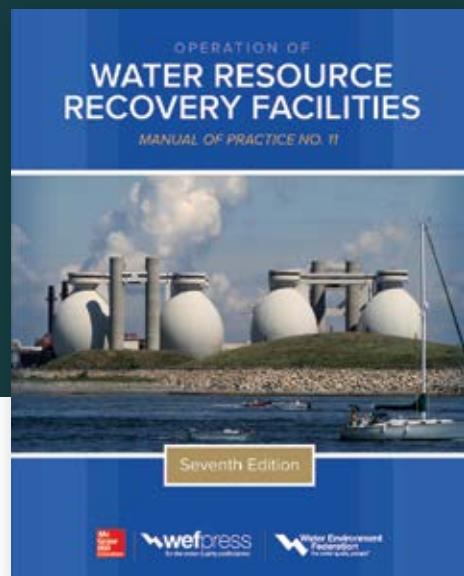
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Natural treatment systems

Most wastewater treatment processes mimic biological, physical, and chemical processes in nature. Treatment systems provide the condition or environment for these natural processes to work efficiently and, in some cases, for selected microorganisms to proliferate and dominate the process. Some of these treatment technologies can reduce the footprint (i.e., surface area covered by the treatment system) and increase loading rates compared to the capacities of the natural environment to assimilate the contaminants.

Natural treatment systems comprise a wide variety of treatment technologies including soil adsorption, lagoons, aquatic and emergent plants, and constructed/engineered wetlands. This type of treatment system tends to be the most cost-effective where adequate land is available. There are inherent drawbacks and advantages to these technologies. We will try to point some of these out in this article.

Soil adsorption systems can include on-site treatment systems (i.e., contour systems, septic systems, etc.). On-site systems consist of one or more septic tanks which provide sedimentation and digestion of settled solids and floatable material, followed by a series of gravel-filled trenches which provide biological treatment and filtration of the septic tank effluent before percolation into the ground to recharge the groundwater. The main advantages to these systems are the ease

and low cost of operation and maintenance (a certified operator is likely not required) and the absence of an effluent discharge. A few disadvantages include the need for a level dispersal field with permeable soil and possible replacement of the bed in the not-too-distant future, depending on use, maintenance, and soil type.

Lagoon systems are quite common in the region. This type of treatment technology was discussed in a previous article so our discussion here will be limited. Lagoons and wetlands are good at reduction of organics (BOD) in the wastewater. However, there is a limit to the ability for lagoons to convert ammonia (which can be toxic) to less toxic nitrogen compounds like nitrites and nitrates. This conversion of ammonia to nitrites-nitrates is called nitrification. Lagoons and wetlands may be able to nitrify under limited circumstances and not consistently. Depending on effluent targets, some systems may require additional treatment components to provide nitrification, such as the addition of fixed film process, to address acute toxicity issues in the effluent. Figure 1 presents the installation of one type of fixed film process marketed under the name Biocord. There are many other configurations that have been tried to achieve nitrification with lagoon systems, with varying degrees of success, and costs. Lagoons can generate algae which can increase the effluent suspended solids concentration and which may, in turn, negatively impact the disinfection capacity of the facility.



Figure 1 – Biocord reactor installation.

Lagoons take up a lot of land area compared to mechanical plants. For example, a lagoon may have a hydraulic retention time (HRT) of 30 days whereas an activated sludge plant may have an HRT of 24 hours.



Figure 2 – Aerial view of lagoon converted to SBR and sludge holding pond.

Constructed or engineered wetland systems typically comprise a bed or channel filled with media (sand or gravel). There are three primary categories of constructed wetlands: free-water surface, subsurface flow, and vertical flow.

Wetlands treatment would typically require at least preliminary treatment upstream of the process, such as screening, grit and scum removal. A septic tank can be effective as the preliminary treatment stage upstream of wetlands treatment. Wetland treatments have

a large footprint, typically more than a lagoon. Some wetlands use gravel as media which allows passage of wastewater and sites for attachment of fixed film microorganisms. Other configurations may have emergent plants that provide sites for fixed film attachment. It is predominantly the fixed film microorganisms that are responsible for the biological consumption of the organics in the wastewater.



Figure 3 – Wetlands treatment.

There are some treatment technologies that use aquatic (macrophyte) and emergent plants as part of the treatment process. Plants are typically bedded in gravel or sand, allowed to float, or are suspended in the water column.



Figure 4 – Greenhouse treatment system.

The plants can serve a number of functions: uptake of phosphorus, provision of sites for fixed film microorganisms, evapotranspiration of the wastewater, and uptake of nutrients. These facilities are often installed in a greenhouse to allow penetration of sunlight for the plants and protection

against weather. Depending on the types of plants selected, the greenhouse may need to be heated, which can be a tremendous cost in our northerly climate. Maintenance of wetlands includes caring for and harvesting of the plants, dredging of settled solids, and cleaning or replacement of media. 

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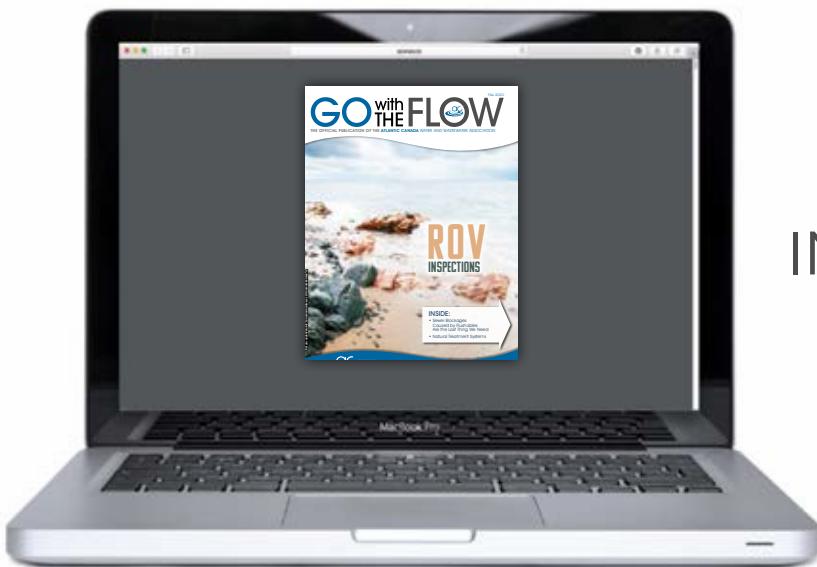
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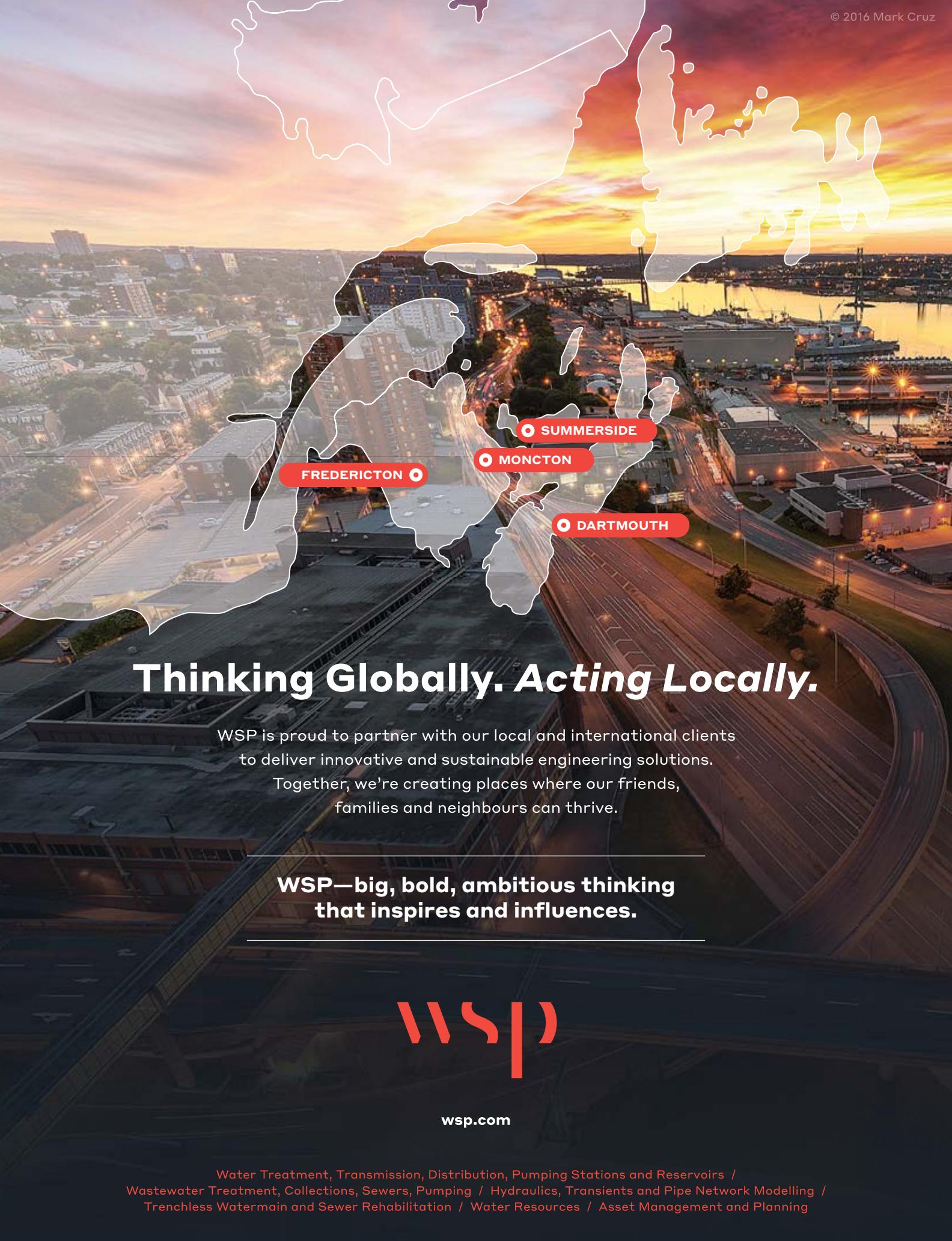
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