



Maritime Provinces Water & Wastewater REPORT

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MESSAGE FROM THE CHAIR

■ BY JERRY VILLARD

I hope everyone's Christmas and New Years with family and friends was enjoyable and you had a chance to recharge for the upcoming winter.

Our 40th Annual MPWWA Training Seminar is being held in Halifax at the Marriot Harbourfront Hotel from April 19 to 22 and registration is now open. Visit mpwwa.ca for details and to register. After three years of trying to host the ACWWA Top Ops competition to decide representatives for ACE in June, we have decided to hand it back to ACWWA due to lack of interest at the MPWWA seminar. We have the preliminary seminar schedule out to everyone, so check mpwwa.ca: Annual Training Seminar or download the MPWWA app on your phone for updates or changes. The theme for this year is: "Growing Our Industry - Environment, Technology and your Future." See the announcement inside for details.

The chosen charity for proceeds from our silent auction is Dreams Take Flight-Halifax. If you have any items you would like to donate for the auction, please contact your zone director or bring them to the seminar and get in touch with this year's auction coordinator, Andre van der Velden, or Bill Cannon. You can also leave them with registration desk.

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Sarah Ness reflects on being first female water operator in Fredericton

From whiskers to test tubes, Ness has 'no regrets' about leaving her early dream of being a veterinarian behind to pursue science

■ BY ANDY WALKER

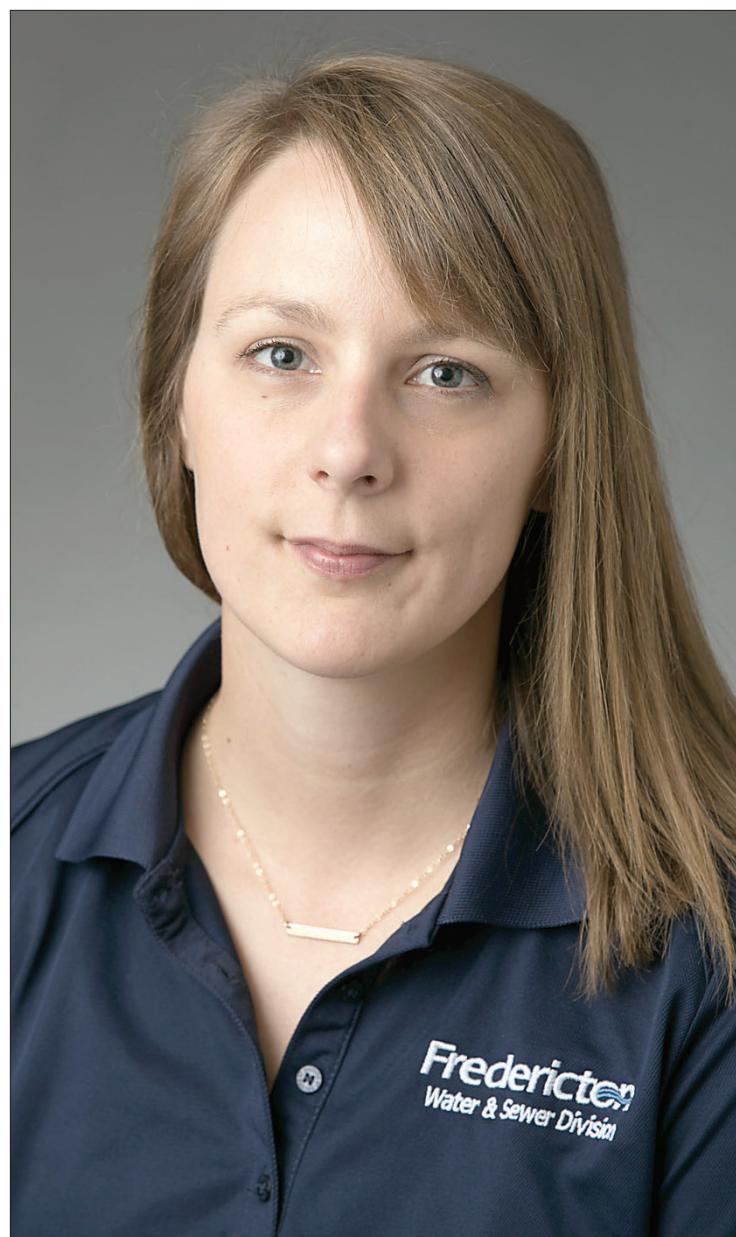
When she was in high school, Sarah Ness was sure of her career path.

"I wanted to be a veterinarian," she says.

However, when she found herself working with animals in a summer job, she began to rethink her career trajectory. What she really liked about working in a veterinary office was the laboratory work, so she thought perhaps a career that allowed her to work in a laboratory setting might be the ticket.

She applied for both the medical technician and chemical technician programs at New Brunswick Community College. The latter program had the first opening and that training eventually enabled her to become the first female operator ever hired by the City of Fredericton's water department.

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Sarah Ness was the first female operator hired by the City of Fredericton's water department. She is now a supervisor and is seeing more women entering the industry.

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MESSAGE FROM THE CHAIR

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I'm looking forward to seeing as many of you as possible attend this year. We're going to have a large equipment trade show again with all types of existing and emerging technologies and products for you to ask the suppliers about.

This year promises to be another challenging one for operators as more regulations come into effect in some areas. This will be one of our workshops for Nova Scotia operators at the seminar. Ask your managers and supervisors now to attend the Annual Training Seminar in April where you can get ex-

posure to products, suppliers, regulators, and most importantly access to operators who are already using it and can give you hands-on insight.

More information will be coming to your email inbox shortly with details on the workshops and presenters, tours, and charity auction in the form of a brochure. This was developed as something that could be passed up to superiors to help in justifying attending the seminar. The MPWWA phone app will be updated with any changes that are made until the actual workshop is held. You will see two sections, Annual Training Seminar and Spring/Fall Workshops. Under the latter you'll see upcoming training workshops as they're scheduled, and you'll be able to register from there.

All members should have received your 2020 membership cards. Again, this year at the AGM we have amendments to association bylaws to reflect changes required legally by the Registrar of Associations. The bylaw amendment will clarify what is the definition of a quorum at the AGM. We currently have a definition of a quorum for board of directors' meetings but not the AGM. We will be able to answer any questions members may have anytime between now and the AGM on Tuesday morning at the seminar. Please feel free to contact me if you have any questions and I will ensure you get an answer.

Come see us in Halifax in April. It's a great place to visit anytime!



Sarah Ness reflects on being first female water operator in Fredericton

Continued from page 1

Ness says she never really considered herself a trailblazer as the only female in a department numbering around 40, depending on the time of year. She remembers being a little intimidated before she actually started the job, but says, "Everybody was so welcoming and once I started it was really a non-issue. I work with a really great group of people."

In the eight years since she joined the department, Ness has worked her way up to supervisor and was pleased when the department hired a second female to fill her vacant operator job.

When she first started going to industry meetings like the MPWWA, she again found herself often being the only woman in the room.

"That is starting to change," she says. "Each time I go to a conference there are more and more women."

When asked if women face any barriers entering the water and wastewater industry, Ness says the biggest barrier may simply be fact many women aren't aware of the opportunities. She believes this is changing as efforts within the education

system to encourage more females to think about possible careers in science and technology start paying dividends.

"There's room to specialize and advance," she says.

Last year, her department participated in a science and technology career day aimed at students in middle school and junior high, which she says was a major success.

"I think it opened the eyes of the students that took part about the opportunities that are there," Ness says.

She would like to see the water and wastewater industry do more of this type of education, saying, "For a lot of young people, and many adults for that matter, a career is not the first thing that comes to mind when you think of water."

For students who find themselves looking ahead to the job market, Ness has this advice:

"Even if you think you know what career path you're going to follow, make yourself aware of the opportunities that are out there. You could change your mind. That's what happened to me and I certainly have no regrets."

"For a lot of young people, and many adults for that matter, a career is not the first thing that comes to mind when you think of water."

— SARAH NESS

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Gavin focused on giving back to community through work, personal life

■ BY KEN PARTRIDGE

Operator: Mike Gavin
Maintenance/Sewer and Water Operator

Q. Where do you work?

A. Town of Tignish.

Q. How long have you worked in the industry?

A. 12 years.

Q. When did you join MPWWA? What are the advantages of being a member?

A. I joined in 2008. The advantage of being a member is the continuous training and networking opportunities.

Q. What's the biggest challenge in your job?

A. Working with aging infrastructure.

Q. What is your favourite part of the job?

A. Being a hands-on part of the growth and development of our community.

Q. What is your less favourite parts of the job?

A. The extremely high cost of maintaining and upgrading water and wastewater systems in small communities.

Q. How did you first become involved in the industry?

A. The position became available when I was looking for a career change and wanting to work closer to home.

Q. What's the least understood part of your job? What else should the public know about what you do?

A. Though community beautification and maintenance are what's most visible to the public, it's only part of what it takes to work for a municipality. Maintaining healthy drinking water and a working wastewater system is essential but goes largely unnoticed.

Q. What's something everyone knows about you?

A. How much I love being a part of my community and being a volunteer firefighter.

Q. What's something almost no one knows about you?

A. The reason I try to give back so much is because I survived a car crash



Giving back to his community of Tignish is very important to Mike Gavin.

and spinal cord injury 17 years ago. Without the skill and dedication of our volunteer firefighters and first responders, I wouldn't be here to have the opportunity to help others.

Q. What is your proudest professional accomplishment?

A. Getting all my Level Ones.

Q. What is your proudest personal accomplishment?

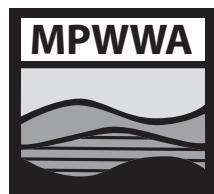
A. My family. My wife works for a large business within the community and my boys are in third year at university and Grade 12. I'm very proud of their work ethic and pride in where they come from.

Q. What's your best advice to a fellow industry member, or someone looking to join the industry?

A. Continue learning and utilizing the contacts you make through organizations like the MPWWA. They have years of experience and a wealth of knowledge, and they're always willing to offer advice or direction.



When Mike Gavin was looking for a career change that would allow him to be closer to home, the water and wastewater industry beckoned.



Maritime Provinces Water & Wastewater

REPORT

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Climate crisis contributing to increased concern over algae blooms

Researcher Helen Baulch is investigating ways to mitigate or prevent blue-green blooms via active intervention in lakes and watersheds

■ **BY JENNIFER THOMA, USASK**

Researcher Helen Baulch is investigating ways to mitigate or prevent blue-green blooms via active intervention in lakes and watersheds

“I used to think blue-green blooms were a really interesting issue, and not one that would cause me to lose sleep at night. Now, my worry is growing,” says Helen Baulch, lead investigator on a USask-led Global Water Futures project looking at developing forecasting tools and mitigation options for diverse bloom-affected lakes.

The frequency and severity of algal blooms and cyanobacteria are increasing across the globe due to higher nutrient loads—mainly phosphorus and nitrogen transported into lakes by runoff from agricultural land, and municipal effluent.

“Overlay this with changes in climate that are warming waters, and things will get a lot worse,” says Baulch, a member of USask’s Global Institute for Water Security.

A water treatment facility has a large matrix of risks to manage, says Baulch, who has been working with such plants over the years to help meet some big challenges.

Microbial risks, such as the cryptosporidium parasite in drinking water that sickened nearly 7,000 people in North Battleford, are the primary concern of treatment plants. Microcystin and other toxins are lower on the priority list.

Baulch has some thoughts about what should be done about future algae blooms. “We need further efforts to mitigate the bloom issue. We also need proactive water treatment in light of what we know about the toxins that can be present.”

Nutrient management is the most important step to mitigate blooms, but direct efforts to treat the ecosystem also are helpful, she says. Lake aeration—bubbling air through the water to add oxygen—is widely used in Canada to address bloom-related issues.

In some areas of Europe where cyanobacteria blooms are severe, direct treatment of lakes with alum and other chemicals has shown promise, Baulch says.

She is investigating what causes lakes to shift to cyanobacteria from beneficial algae such as diatoms, which play an integral role in a healthy lake ecology by producing oxygen and serving as food for other life forms. She is testing a hypothesis that low lake oxygen levels—caused by such factors as algae decomposing on lakebeds—trigger changes that cyanobacteria need to become dominant.

Hundreds of lakes, especially those that are nutrient-rich shallow water bodies, are potentially at risk, and even some lakes in more northern locations are starting to show blooms as waters warm with climate change. In lakes where phosphorus has accumulated



Helen Baulch, lead investigator on a USask-led Global Water Futures project, says a changing climate is making the issue of algae blooms urgent and deeply concerning.

in sediment, the nutrient can be released into the water even decades later. This lag time before efforts to reduce nutrients show a benefit can be tough for policymakers, Baulch says, because citizens expect quick results from mitigation measures.

But a recently released study led by a

post-doctoral fellow in Baulch’s lab shows that carefully controlling inputs (such as fertilizer) on agricultural land can rapidly draw down phosphorus concentration in soil and reduce the nutrient in run-off.

“We thought that there’d be a much longer lag time, so it’s promising that we can get

a fast response in hotspots of nutrient transport,” she says.

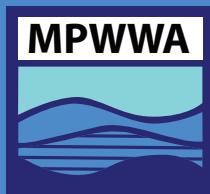
Baulch is working with watershed groups and industry groups to develop workable solutions, employing buoy-mounted high frequency water monitoring tools to gather data that help predict bloom formation.

“There’s a lot that we can do, and have been doing to mitigate problems,” Baulch says. “But with a changing climate adding to the challenge, this issue is urgent and deeply concerning.”

For more information, visit: <https://gwftest.usask.ca/science/projects/p3-form-bloom.php>.

“I used to think blue-green blooms were a really interesting issue, and not one that would cause me to lose sleep at night. Now, my worry is growing.”

— HELEN BAULCH, LEAD INVESTIGATOR, USASK GLOBAL WATER FUTURES PROJECT



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Cobalt designated toxic substance by Health Canada

Cobalt levels within acceptable range in Atlantic water systems, but monitoring is being prioritized

BY ANDY WALKER

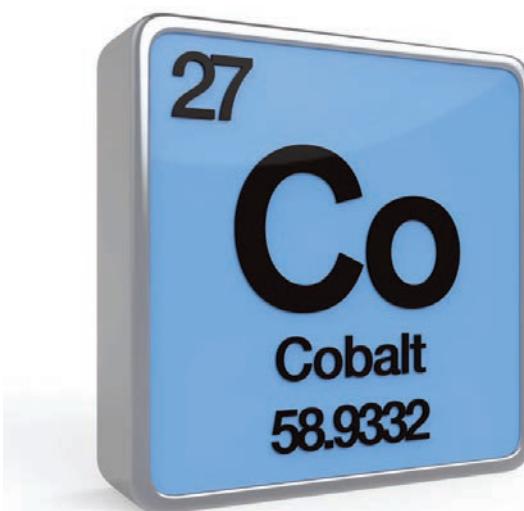
In the wake of a designation by Health Canada adding cobalt to the list of substances dangerous to human health, the Charlottetown Water and Sewer Utility is taking steps to monitor the level of the compound in its system.

Richard MacEwen, manager of the utility, says, "We definitely have had some in our system," and the utility will be monitoring the levels to ensure it isn't a threat to the safety of people using the system. MacEwen says past levels have been well within the Canada Drinking Water Guidelines.

Meanwhile, the 2018 report from the Greater Moncton water system shows cobalt levels of less than 0.1 ug/litre.

Cobalt has a number of uses in Canada ranging from an intermediate in metallurgical processes, non-ferrous metal smelting and refining, to components in alloys and carbides, as feed supplements and fertilizers, and in hard material tools, paints and coatings, plastic, rubber, batteries, and other consumer products.

"Sources of release of cobalt to the environment from manufacturing involve rubber, chemicals, paints and coatings, plastics (polyester resin), fertilizers, and animal feed," says the Health Canada order. "In addition, the following sectors have the potential to release cobalt as a by-product: electricity (power generation), petroleum refining, oil sands, pulp and paper mills, electrical



Cobalt element from the periodic table.

and electronic equipment, waste management, wastewater, and biosolids."

However, the major danger is the release of cobalt during mining of base metals such as copper and nickel. The cobalt dissolves into the contact water and is then released as mine effluent that continues to be released

"Cobalt, once dissolved in water, may be taken up by aquatic-, soil-, and sediment-dwelling organisms to which it has been demonstrated to cause harm at very low concentrations in terms of survival, growth, or reproduction."

from waste storage areas long after the mine has ceased operation.

The ruling is the last stage in a consultation process that began back in 2014. The order indicates, "Cobalt, once dissolved in water, may be taken up by aquatic-, soil-, and sediment-dwelling organisms to which it has been demonstrated to cause harm at very low concentrations in terms of survival, growth, or reproduction."

The order allows government to propose risk management measures respecting preventive or control actions for toxic substances. Developing an implementation plan and an enforcement strategy and establishing service standards are only considered necessary when a specific risk management approach is proposed, something that isn't recommended in this order.

Efforts under way to remove lead from region's drinking water infrastructure

■ BY ANDY WALKER

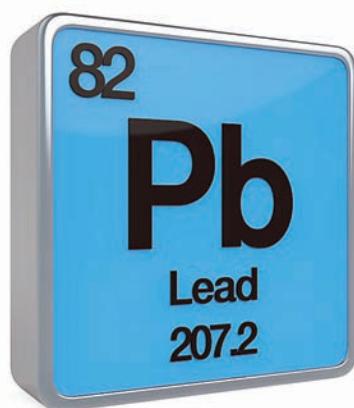
The largest city in the Atlantic region has embarked upon a plan that will see lead piping eliminated from its water system within 20 years.

Halifax Water has been offering customers a subsidy of 25 per cent of the cost of replacing lead piping up to a maximum of \$2,500 for the last several years. As well, James Campbell, communications and public relations manager for the utility, says Halifax Water continues to work on replacing the lead in its own aging infrastructure, some of which is 100 to 150-years-old.

Campbell readily admits the major investigation spearheaded by the Institute for Investigative Journalism played a role in the decision to take more direct steps to “get the lead out of aging parts of the city’s infrastructure.” Lead pipes have been banned in new construction since 1975.

The Institute’s investigation involved more than 120 journalists and nine universities. It revealed that as much as one third of the 12,000 tests conducted since 2014 exceeded the national safety guideline of five parts per billion. The journalists also visited 32 municipalities across the country, seeking volunteers to take part in water testing. Of the 260 tests conducted, 39 per cent failed to comply with the current federal guideline. Halifax was one of the cities in the study and the results showed over one third of tests results were above the guidelines.

A study published in the medical jour-



Utilities around the region are reacting to a journalism project that showed unacceptably high levels of lead in drinking water across the country.

nal Lancet maintains 400,000 deaths in the United States are annually linked to lead exposure from all sources. The Lancet article says, “High levels of exposure have been linked to behaviour problems in children, miscarriages, hypertension in adults, and cardiovascular diseases in adults.”

Campbell says the utility’s subsidization plan originally called for the elimination of lead from both private and public sources by 2050, but it became clear from the study that this time frame is too long. The new plan, which has been approved by Halifax Water’s board, will see the municipality pick up the total cost of taking lead out of the system by replacing the estimated

3,500 private lines, as well as the 2,000 lines owned by the utility.

Campbell says the next stage is an application to the Nova Scotia Utility and Review Board for a rate increase to help cover the \$38.5 million bill for the 20-year program. The cost for replacing the private lines is estimated at \$10.5 million. Campbell says the plan to include private lines is the first of its kind by a municipal utility in the country.

Over the next two decades, Campbell says the utility will make every effort to coordinate replacing the lead pipes in the public system with the paving schedule of Public Works to avoid extra cost.

Campbell says it was hard to predict how long it would be before the project received approval from the provincial regulator, but Halifax Water is hoping to start implementing the plan by the end of 2020. The top priority for private replacements will be homes with high levels of lead in testing, and buildings such as daycares where children might be at greater risk of exposure.

Charlottetown also has some infrastructure that’s well over 100-years-old and the manager of the Water and Sewer Utility says it came as no surprise lead was discovered in its system. However, Richard MacEwen says all the tests to date have shown levels below the federal government guidelines for drinking water.

MacEwen says P.E.I.’s largest municipality is putting together a proposal to the provincial government for a program that

would help fund the replacement of lead pipes for both public and private lines. However, he couldn’t offer any details as the plan has yet to be approved.

Meanwhile, a statement from Saint John Water reassured residents of that city there are “no known publicly-owned lead water services used in the city’s municipal drinking water service, and the quality of the drinking water exceeds Health Canada Guidelines for consumption.”

“High levels of exposure have been linked to behaviour problems in children, miscarriages, hypertension in adults, and cardiovascular diseases in adults.”

— THE LANCET

The statement notes the port city began work to replace lead water services on the publicly-owned infrastructure in the early 1990s, when the city performed a review and created a detailed list of all lead services for the purposes of removing them from the municipal system.

“Between then and the mid-1990s, the city issued several tenders to replace the lead water services with copper water services that remain safely in use today,” the statement says.

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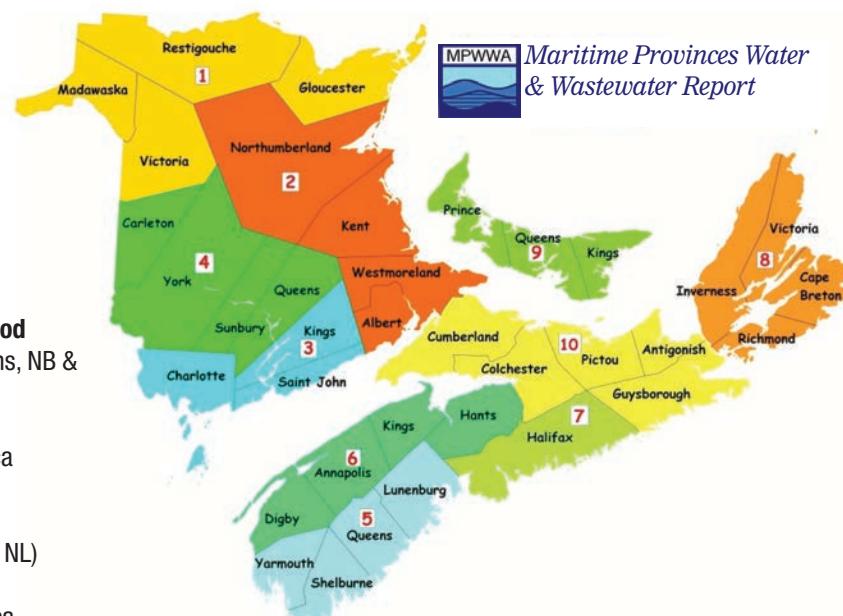
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Report suggests ways to control inflow/infiltration in new sewer construction

■ BY ANDY WALKER

As the first step towards developing a standard around inflow/infiltration (I/I), a foundation document is suggesting ways sewers can be constructed to mitigate the risk.

The report was developed for the Standards Council of Canada by Barbara Robinson from Norton Engineering Inc., Dan Sandink of the Institute for Catastrophic Loss Reduction, and David Lapp from Engineers Canada.

Inflow/infiltration refers to any water other than domestic, commercial, or industrial wastewater that enters sanitary sewer systems. Inflow refers to excess water that flows directly into a sanitary sewer system while infiltration covers industry entry into the system through cracks or loose joints.

The report's authors say the unwanted water can take a toll on a water system, including increased wastewater treatment costs, wastewater treatment plant expansion costs, reduced capacity in trunk sewers, reduced opportunity

for municipal revenues associated with development, increased administration costs for municipalities, reduced lifespan of sewers, and increased risk of insured and uninsured damages associated with basement flooding.

The document concentrates its efforts on new sewer construction, noting identifying sources of I/I in older systems is costly, as is elimination, and not always effective. The document is centered on work done by Norton Engineering in Ontario between 2015 and 2019, including an analysis of low monitor data, site inspections, and interviews with industry members.

The project was also supported by an 18-member expert stakeholder committee representing municipalities and municipal utility agencies, national and provincial construction code development agencies, consulting companies, industry associations, and manufacturers from across the country.

Continued on page 9



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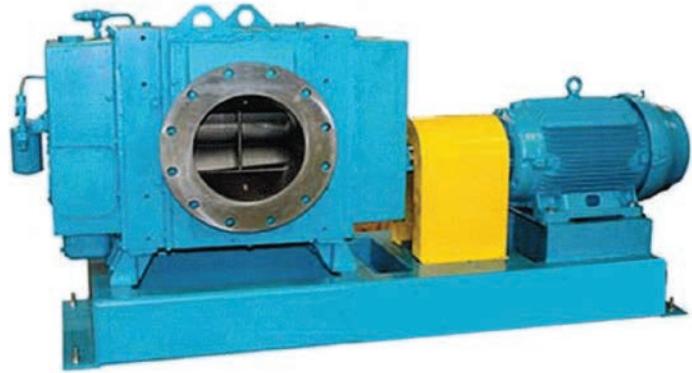
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Nominees being vetted for 2020 National First Nations Water Leadership Award

There are people who, by their everyday actions, guide, influence, and inspire. We call them leaders. Recognizing these leaders was the inspiration behind the creation of the National First Nations Water Leadership Award. Marc Miller, minister of Indigenous Services, is now considering potential honourees from across Canada for the 2020 awards.

The award is an annual recognition of First Nations individuals or organizations demonstrating leadership and outstanding dedication to the advancement of clean and safe drinking water in First Nations communities.

Nominees for this year's award include First Nations individuals (community members or leaders), and First Nations organizations or communities. Examples of initiatives the award seeks to recognize include:

- creating, promoting, or advancing Indigenous community-based outreach or programs in support of clean and safe drinking water.
- making concerted efforts and providing leadership during community drinking water emergencies or water infrastructure challenges (such as ending long-term drinking water advisories).
- developing and advancing innovative practices in relation to drinking water.
- showing dedication, work, and achievements which support clean and safe drinking water, including water system operation, relationship-building, planning and prevention.

• showing extraordinary involvement in First Nations water-related issues.

An advisory committee consisting of First Nations partners, organizations that support Indigenous communities, and representatives of Indigenous Services Canada review nominations and provide recommendations to Miller.

The winner will be announced later in the year.

Indigenous Services Canada established the National First Nations Water Leadership Award in 2018 as an annual award. The recipient of the inaugural National First Nations Water Leadership Award was Lorraine Crane, chief of Slate Falls Nation, in recognition of her outstanding leadership and dedication to the advancement of clean drinking water in her community.

Deon Hassler, former water operator from Carry the Kettle Nakoda Nation, received the 2019 National First Nations Water Leadership Award.

This year's recipient will receive a trophy and a piece of Indigenous artwork at a later event.

The recipient will also be honoured through the creation of three bursaries in their name to support water operators in their professional development.

For more information on the awards, email Indigenous Services Canada at aadnc.proprepnh2o-cleanfnh2o.aandc@canada.ca.

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Charlottetown connects East Royalty wastewater to pollution control plant

■ BY ANDY WALKER

Charlottetown is now treating all its wastewater at its pollution control plant.

Using funding from the Clean Water and Wastewater Fund, a sewer lift station and forcemain was constructed to allow wastewater from the lagoon in the neighbourhood of East Royalty to be pumped to the plant on Riverside Drive near the city's eastern boundary.

"This is great news for the City of Charlottetown and its citizens as we now have all wastewater within the municipality being treated at one top-notch facility," says Mayor Philip Brown.

The Charlottetown Water and Sewer

Utility operated the East Royalty Sewage Collection and Treatment System since East Royalty became one of five communities incorporated into the capital city in a 1995 amalgamation. The system, which was located between Bonnie Blink Drive and Robertson Road, was constructed in 1987 and serviced more than 1,600 people.

"This project reduces our overall impact on the environment and ensures sustainable wastewater treatment into the future for East Royalty and the surrounding area," says Charlottetown Deputy Mayor Jason Coady, chair of the City's Water and Sewer Utility Committee. "This work should give residents in the area peace of mind knowing they are now connected to a state-of-the-art facil-

ity. We thank our partners at the federal and provincial level for their support in making this possible."

For the construction of a sewer lift station and forcemain, the Government of Canada invested \$1.925 million while the Government of Prince Edward Island and the City of Charlottetown each contributed more than \$962,000. For the upgrades to the gravity lines leading to the Charlottetown Pollution Control Plant, Ottawa invested \$2.2 million under the Clean Water and Wastewater Fund while the Government of Prince Edward Island and the City of Charlottetown each contributed \$1.1 million.

"It's great to see progress continue on this project, which will give East Royalty

residents better access to improved wastewater services and more protection to our environment," says Charlottetown-Hillsborough Park MLA Natalie Jameson.

Brown says with the East Royalty project now in the books, "we can focus on the final upgrades at the wastewater treatment plant and taking on the flows from the Town of Stratford at that facility, which brings us one step closer to a regional pollution control system."

Work is now under way to build a delivery system that will allow wastewater to be shipped to the Pollution Control Plant across the Hillsborough Bridge, which connects Stratford to the capital city. Birch Hill Construction was awarded the \$17,590,642.82 tender last September.

Report suggests ways to control the inflow/infiltration in new sewer construction

Continued from page 7

"An initial review of low monitoring data for 35 new subdivisions in southern Ontario indicated that 34 of them demonstrated excessive I/I rates," the document notes. "Information provided directly by municipalities indicates that 85 subdivisions in Ontario demonstrated excessive I/I."

Sources identified for the I/I in the document include construction practices on the public and private sides of the property line, inconsistent application of testing and quality assurance practices; construction in locations where groundwater is located above the lowest sewer elevations; lack of clarity in codes, standards, and guidelines; and jurisdictional issues, notably related to responsibilities and construction requirements on private and public sides of the property line.

The authors say mitigating the problem in new construction requires concerted action on both the private and municipal sides by everyone involved in the development of new subdivisions.

"Collection of low monitoring data from new subdivisions is starting to take place across Ontario," the document says. "A recommendation from this project is that municipalities not only continue to collect relevant data, but also that a commonly accepted method for analyzing this data be developed. It is recommended that the technical committee involved in the development of the national standard or guideline pursue development of a set of recommendations for data collection and analysis."

The report says time-of-sale requirements (which are now applied in some American jurisdictions) may help control excessive I/I. The requirements include such things as CCTV inspections of laterals and review of the records by municipal

staff, which must be done before any sales processes can be completed.

"Measures have been effective where applied, but they have not been applied in Canada," the authors say. "Further investigation of this method is warranted."

The document says I/I has the potential to be affected by climate change concerning extreme rainfall. "Managing I/I in new construction supports numerous provincial climate change adaptation policy documents. For example, provincial climate change adaptation plans have highlighted the need to adjust codes and standards to increase resilience to extreme natural events and climate change, and have highlighted the need to address flooding associated with short-duration, high-intensity weather events."

The authors recommend a national standard be developed for new construction.

"The development of a national standard will require ongoing consultations with all affected stakeholder groups across Canada, notably municipalities, which are typically responsible for regulation of sewer infrastructure design and construction, and the development sector, which is directly tasked with construction of the infrastructure. Further, several opportunities exist to review and potentially refine provisions contained within national and provincial building and plumbing construction codes, as well as local regulations that may be applied to govern sewer construction on the public and private sides of the property line.

"Sewers overburdened by excess water limit the potential for new and expanded development in Canada's urban areas and increases the risk of flooding and environmental damage," says Chantal Guay, chief executive officer of the Standards Council of Canada. "This report is an important step toward establishing a clear national standard for preventing unacceptable I/I.

Put into practice, this knowledge will save public money, reduce the risk of basement

sewer backups, and contribute to more resilient urban infrastructure in Canada."



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Wastewater, biosolids not significant contributors to PFAS contamination

PFAS are a family of chemical compounds commonly used in many different products we encounter in our daily lives, which is how we're exposed to them and how they end up in trace amounts (parts per billion or less) in wastewater and biosolids and other residuals, such as septage, paper mill residuals, digestates, composts, and soils.

Fortunately, PFOA and PFOS, the most concerning and most-researched PFAS, have been mostly phased out, reducing potential risk. Such source reduction is the most efficient action to reduce risk and it reduces potential concerns related to PFAS in recycled biosolids and residuals.

Industry, military uses, and fire-fighting are sources of significant PFAS contamination in the environment (example: Pease International Tradeport drinking water well impacted by fire-fighting foam: 2,500 ppt PFOS in 2014). In contrast, wastewater, septage, and biosolids are part of low-level "ambient background" levels.

Almost all known sites with high levels (above 70 ppt) of water and soil contamination by PFAS are directly related to: industrial uses of significant volumes of PFAS with direct discharges to land or air; or fire-fighting and fire training sites, including military sites and airports. These are the sites that deserve and are getting the highest level of federal Department of De-

fense, Health Canada, and provincial environmental agency attention.

Wastewater, septage, biosolids not "sources" of PFAS

Wastewater treatment processes don't utilize PFAS chemicals. Wastewater, septage, and biosolids convey traces of PFAS used and encountered in daily life. Only in a few worst-case scenarios have wastewater and biosolids been implicated in PFAS water contamination at levels of concern (e.g. near or above 70 ppt in water).

These rare cases are where industrial facilities using significant volumes of PFAS engaged in ongoing discharges to the sewers. In these rare situations, PFAS levels in wastewater and biosolids have been reduced efficiently by investigating industries discharging to the sewer system and stopping their discharges through industrial pre-treatment requirements and other source controls.

PFAS exposure from biosolids, residuals unlikely and minimal

Risk assessments have determined direct contact, inhalation, or ingestion of typical biosolids, and other recycled residuals pose no significant health risk, including from the traces of PFAS they contain. Typical levels of PFAS in modern residuals are about 10 times less than the most stringent direct contact standard for soils, which is 300 ppb. And, when biosolids and residu-

als are applied to soils, they're diluted (typically 200 times), further reducing potential exposure.

Can PFAS leach from soils amended with biosolids and residuals to affect ground and surface water?

This is the one concern raised regarding PFAS in biosolids and residuals. Limited research shows this is a possibility. But that research and investigations by regulators indicate typical biosolids with no direct large industrial inputs are unlikely to impact ground and surface waters at levels above 70 ppt. Therefore, the PFAS conveyed in modern wastewater, septage, biosolids, and other residuals are like numerous other incidental, minor releases of PFAS to the environment and are no greater risk to public health than those other releases from daily activities.

What can be done?

Wastewater treatment facilities and biosolids and residuals managers are taking proactive measures to address potential risks from PFAS in wastewater, biosolids, septage, and other residuals. Further research is ongoing on the potential leaching of PFAS into ground or surface waters. The most significant action we can all take is to support removal from commerce of chemicals of high concern. That reduces the potential concerns related to wastewater, biosolids, septage, and other residuals.

Health Canada proposing to raise standard for aluminum in drinking water

■ BY ANDY WALKER

Health Canada is currently in the process of considering changes to the guideline value for aluminum in drinking water.

A 90-day consultation period ended August 30 and the federal department is now in the process of reviewing the guidelines. The existing guideline technical document on aluminum, developed in 1998, recommended OG values for treatment plants using aluminum-based coagulants as follows: less than 0.1 mg/L (100 µg/L) for conventional treatment plants and less than 0.2 mg/L (200 µg/L) for other types of treatment systems (e.g., direct or in-line filtration plants, lime softening plants).

A maximum acceptable concentration (MAC) of 2.9 mg/L (2900 µg/L) is proposed for total aluminum in drinking water, based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. An OG value of 0.050 mg/L (50 µg/L) is proposed for total aluminum to optimize water treatment and distribution systems.

Richard MacEwen, manager of the Water and Sewer Utility for the City of Charlottetown, isn't expecting the changes will mean any major changes for operations in the Island capital. MacEwen says the utility doesn't use aluminum as part of its treatment program.

Aluminum salts are often added as coagulants during water treatment to remove turbidity, organic matter, and microorganisms. Aluminum is also an impurity found in other water treatment chemicals and can leach into drinking water from cement mortar pipes or linings.

James Campbell, communications and public relations manager for Halifax Water, says the utility does

use aluminum-based coagulants, and while it doesn't foresee a challenge meeting the new MAC, the reduced operational guideline could pose some challenges, particularly in cold weather.

The discussion document from Health Canada notes the main source for Canadians' exposure is through food, followed sequentially by exposure through soil, drinking water, and air. Aluminum concentrations in water vary across Canada, with surface water generally presenting higher concentrations than groundwater.

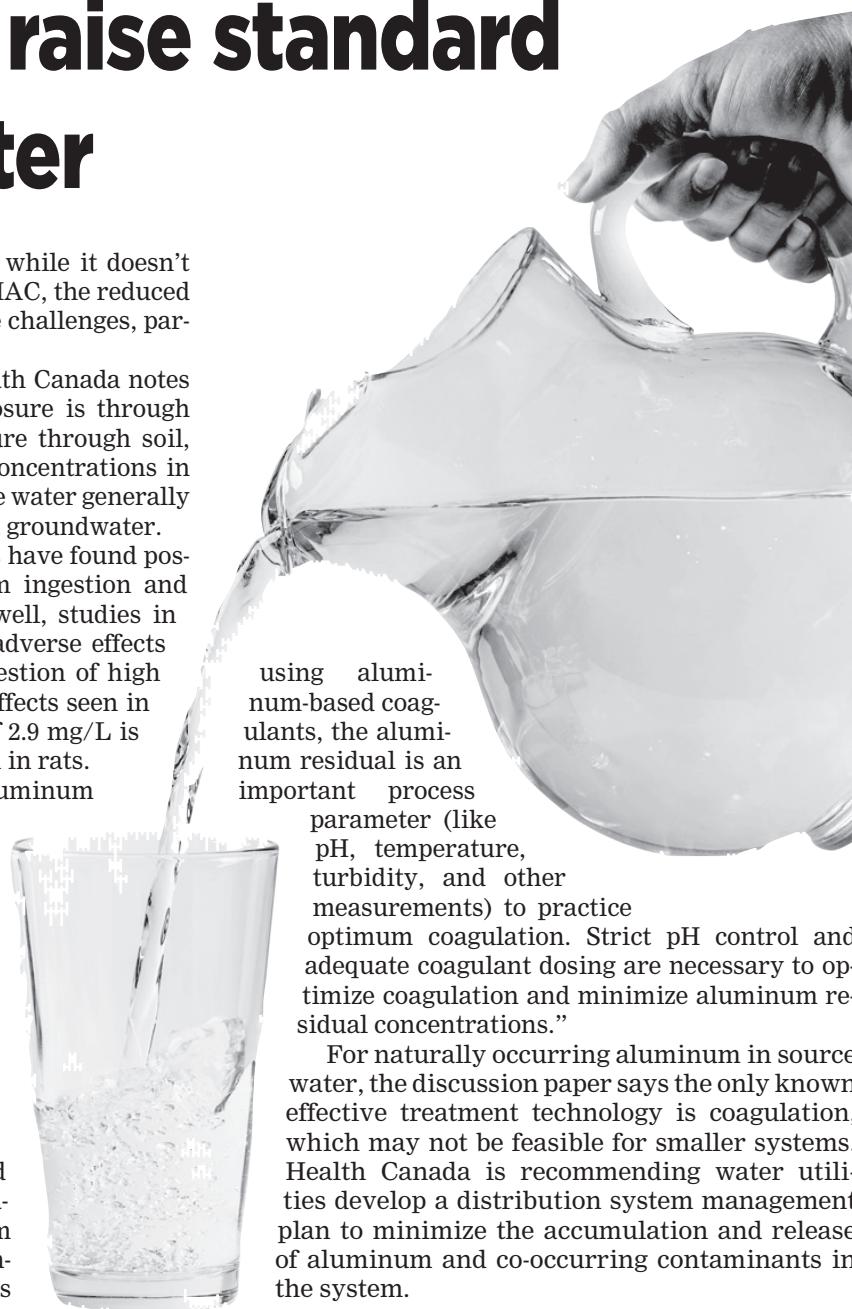
The department notes some studies have found possible associations between aluminum ingestion and diseases of the nervous system. As well, studies in animals have consistently observed adverse effects on the nervous system following ingestion of high levels of aluminum, which supports effects seen in human studies. The proposed MAC of 2.9 mg/L is based on neurological effects observed in rats.

The discussion document notes aluminum can act as an accumulation sink for such other contaminants as arsenic, chromium, manganese, and nickel. It can also influence the concentrations of lead and copper. The metal can also coat water mains, service lines, and water meters, resulting in pressure losses, meter malfunctions, or turbid/discoLOURED water. An OG of 0.050 mg/L is proposed for both the entry point and the distribution system to avoid these issues as well.

"Water treatment strategies should minimize the aluminum concentration that enters the distribution system from the treatment plant," Health Canada says. "For water treatment plants

using aluminum-based coagulants, the aluminum residual is an important process parameter (like pH, temperature, turbidity, and other measurements) to practice optimum coagulation. Strict pH control and adequate coagulant dosing are necessary to optimize coagulation and minimize aluminum residual concentrations."

For naturally occurring aluminum in source water, the discussion paper says the only known effective treatment technology is coagulation, which may not be feasible for smaller systems. Health Canada is recommending water utilities develop a distribution system management plan to minimize the accumulation and release of aluminum and co-occurring contaminants in the system.



Charlottetown approves upgrades for Miltonvale wellfield

■ **BY ANDY WALKER**

The mechanical and electrical system at the Miltonvale wellfield will be getting a \$97,000 upgrade.

Charlottetown city council has approved expenditures of \$94,052 on sine wave filters and \$3,365 on an additional electricity meter that allows for net metering associated with a solar power system.

Charlottetown has always sourced its water from the Winter River-Tracadie Bay Watershed and there have been several occasions over the last several years when many of the small streams that are part of the watershed have stopped running during dry periods.

The development of the Miltonvale Water Supply Project began in 2014 and the project was officially commissioned last spring while delegates were in the

capital for the MPWWA seminar. The final price tag for the project was almost \$15 million.

The newly commissioned wellfield, located on an 80-hectare parcel of land just north of Charlottetown, is designed to provide up to 80 litres per second from a network of five groundwater wells. The project includes nearly four kilometres of 500-millimetre diameter transmission mains to deliver the water into the city.

A 100-kilowatt solar photovoltaic installation is included in the project to demonstrate the use of renewable energy production for water supply. The system design includes disaster resilience measures including on-site electricity production and underground wiring for the wells closest to the hurricane-rated control building.



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