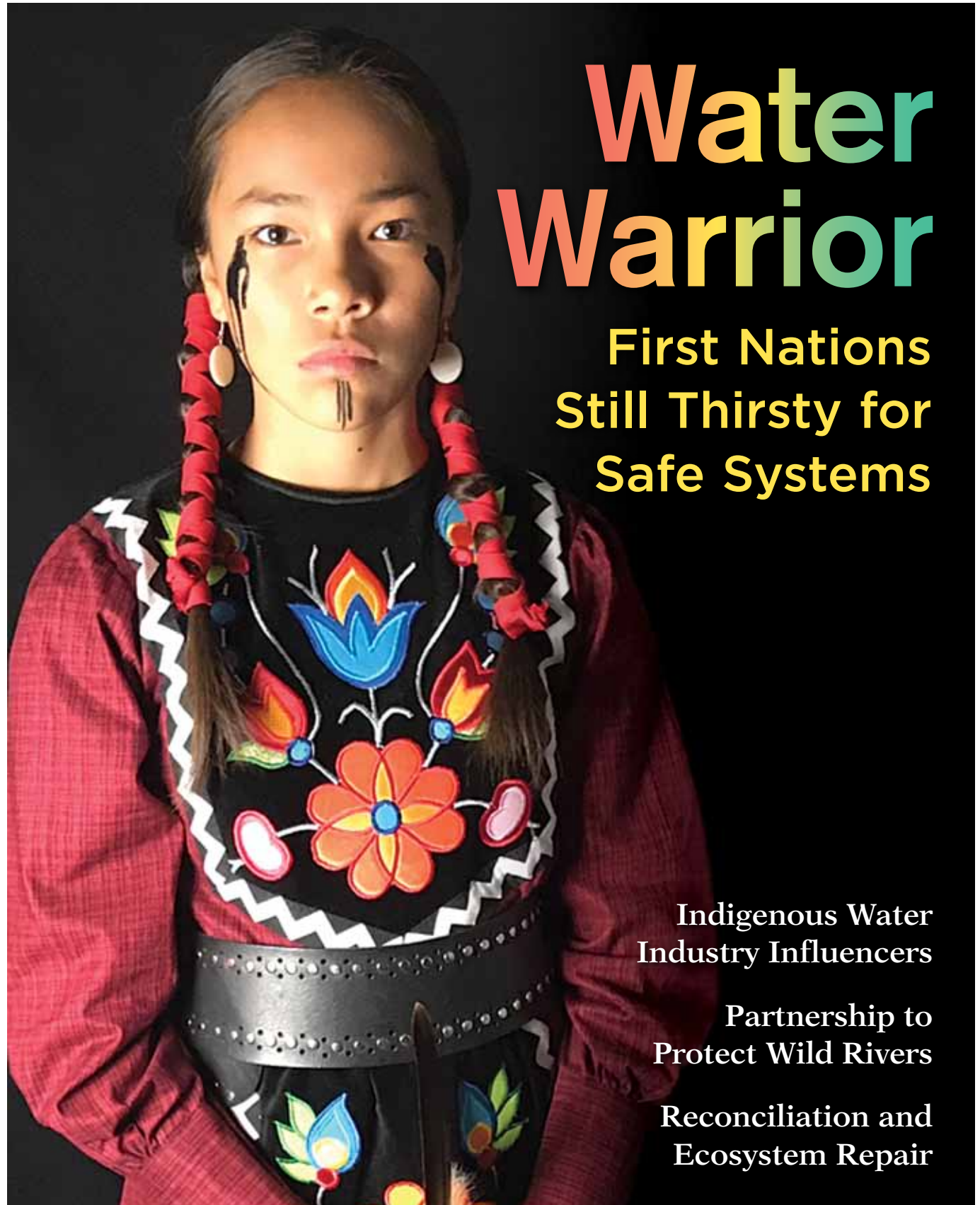


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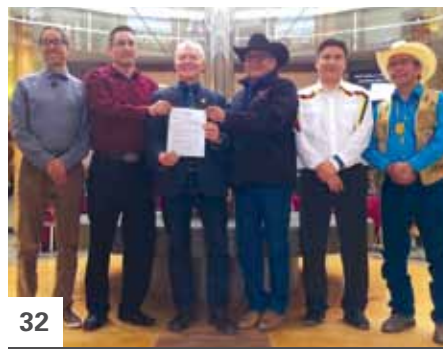
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The Assembly of First Nations invites you to the **2nd Annual AFN National Water Symposium and Tradeshow: First Nations and Water in the 21st Century.**

SAVE THE DATE:

February 26-28, 2019

**Scotiabank Convention Centre
Niagara Falls, Ontario**



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- First Nations organizations and technicians interested in improving the way water and wastewater infrastructure is understood, managed and delivered.
- Consultants, industry, academia and other non-governmental entities involved or interested in First Nations water issues.

The symposium is an opportunity to hear updates on: the recent developments and trends that impact First Nations and water; engage in dialogue with others on key issues and future directions for First Nations water/wastewater governance and water/wastewater infrastructure; and to interact with the latest water/wastewater related product and service providers.

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**Please watch for updates at www.afn.ca
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Radical Reform Needed Now

BY CONNIE VITELLO

I HAD AN EYE-OPENING EXPERIENCE at the Art Gallery of Ontario (AGO) recently. While I'm used to reading about environmental pollution affecting water quality in Canada and across the globe, it's another thing to be immersed in augmented reality images of rarely depicted places that are in extreme need of strategic conservation.

One image was a massive phosphor tailings pond in Florida. It's just a short drive from the Magic Kingdom, but there's nothing magical about this man-made formation that is hospitable to algae and not much else. Phosphate mining is land intensive and the fertilizer main byproduct known as phosphogypsum is dangerous. It poses a leaching risk of toxic sludge during hurricane season and the tailings ponds runoff contains algae blooms that threaten water quality, public health, and wildlife.

AGO's "Anthropocene" exhibit illustrates through first rate film and photography how humans, individually and collectively, are leaving an indelible imprint on our world. The expert research and revealing imagery all point to an undeniable truth that the curators argue convincingly. We've reached an unprecedented moment in planetary history: humans now change the Earth more than all the natural forces combined.

Of course, no one knows this better than First Nations communities in Canada. For generations they have endured the onset of settlers and excavators, and various industries setting up shop on their lands and in their rivers and lakes. The relationship between newcomers and Indigenous peoples has been affected by commercial and economic pressures, by shifting alliances and external threats, and by policies of protection and subordination.

Governmental leaders like Prime Minister Justin Trudeau, Minister of Indigenous Services Jane Philpott, and the Assembly of First Nations are working together to right the wrongs and create a healthy and prosperous new normal.

Similarly, civic leaders like Tamo Campos, David Suzuki's grandson, are helping to shed light on the Indigenous led fight against controversial and ill-planned pipelines, dams, mines, and fish farms. Through his documentary work, he reveals the extent of challenges First Nations people continue to endure today and their obstacles in becoming true partners with industries eager to harvest their environment.

Campos is an avid snowboarder and was inspired to take up advocacy as a way of reciprocating his appreciation of his recreation. His sport provides him with a bird's eye view of the pollution and politics affecting Indigenous resources. I attended a screening of his latest documentary and was impressed with his passion and insightful perspective.

"Sure, we have an abundance of national resources, including water," said Campos. "But let's get back to the root of things and demonstrate better respect for our bounty and the Indigenous people who are stewards of it. Just because there's a market for it, doesn't justify it."

In his film, *The Radicals*, he encourages Canadians to "dig into our roots to create radical waves of change." The documentary was released as part of the Planet in Focus 19th Annual Environmental Film Festival and is well worth watching (theradicalsfilm.com).

In this special edition focussed on Indigenous water issues, we are proud to have the Assembly of First Nations provide their perspective on the updates to safe drinking water regulations and their proposed resolutions for real reconciliation for water safety and sustainability (*page 10*).

Also, don't miss our features on amazing Indigenous advocate, Autumn Peltier (*page 15*), and remarkable Water First graduates who are ready to make waves in the water industry (*page 26*). As we work to reconcile a reckless past, it's wonderful to know that the future has a fighting chance. If anyone is going to fix the Anthropocentric affects of our ancestors, it's this generation. WC

Contact Connie at connie@actualmedia.ca



NATHAN T. WRIGHT
Nathan is a freelance illustrator and artist based in Des Moines, Iowa, USA. His cartoon in our previous edition was retweeted by Canadian Prime Minister Justin Trudeau.
PG 8



CALEB BEHN
Caleb is the special advisor-Water to the Assembly of First Nations Housing, Infrastructure and Emergency Services sector.
PG 10



CORRINE PORTER
Corinne works with the Kaska communities on the development and implementation of the Dane Nan Yé Dāh program in British Columbia.
PG 42



HEATHER CROCHETIERE
Heather is a freshwater specialist with WWF-Canada and she leads the Wild Rivers program.
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ABOUT THE COVER

Drinking Water Reform:

In light of too many long-term water advisories, this is a critical look at the *Safe Drinking Water for First Nations Act* and a call to action from the Assembly of First Nations. How can we help address dangerous gaps in drinking water regulations and resources?

Cover photo credit: Linda Roy, Inva Photography (courtesy of Stephanie Pelletier)

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- **Canada's top water projects**
- **New river floodplains research**
- **Women in the water industry**

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Credit: Government of Canada

New Indigenous Guardians Pilot Program

INDIGENOUS COMMUNITIES have always been stewards of the environment, and in a move to support their efforts, the Government of Canada has made a commitment to helping them conserve and protect Canada's nature, diverse ecosystems, and species at risk.

On November 13, 2018, Minister of Environment and Climate Change Catherine McKenna, announced that 28 Indigenous projects have been selected for early funding totalling just under \$5.7 million as part of the Indigenous Guardians Pilot Program.

“Our Government is committed to reconciliation with Indigenous Peoples. Indigenous communities are deeply connected to the land and understand the importance of acting now to protect Canada's environment and conserve biodiversity. The Indigenous Guardians Pilot Program gives First Nations, Métis, and Inuit the support they need to be the best possible stewards

of their traditional lands, waters, and ice. The work we do together today will ensure a healthier environment for the generations that follow,” McKenna said.

The program recognizes rights and responsibilities to the land, waters, and ice of traditional territories and provides support for environmental conservation. Through the program, the federal government is working closely with First Nation, Métis, and Inuit groups to develop an individual approach in communities across Canada.

Budget 2017 committed \$25 million for the Indigenous Guardians Pilot Program, which has received more than 60 applications for consideration. As part of the government's ongoing reconciliation efforts, this program aims to support progress that reflects each group's unique rights, responsibilities, and perspectives. — Staff

Online at WATERCANADA.NET



NEWS: Inuit Impact and Benefit Agreement on Tallurutiup Imanga.
bit.ly/Tallurutiup



NEWS: Anishinabek Nation Calls for Stricter Rules in Great Lakes Withdrawals. bit.ly/GLakes



NEWS: AFN Chiefs Express Concern Over Effluent Release. bit.ly/Effluent



NEWS: MOU Supports Reconciliation and Watershed Rehabilitation.
bit.ly/WaterMOU



Above: Panelists included: Merrell-Ann Phare, principal of Phare Law Corporation and founding executive director of the Centre for Indigenous Environmental Resources; Irving Leblanc, director of Housing, Infrastructure, and Emergency Services for the Assembly of First Nations; and, Elizabeth Hendricks, vice-president, Freshwater, WWF Canada.

Right: Zafar Adeel, professor of Professional Practice, Resource & Environmental Management at Simon Fraser University.



National Water Vision for Canada

RYERSON URBAN WATER partnered with Simon Fraser University's Pacific Water Research Centre to host a water symposium at the 2018 Canadian Science Policy Conference on November 9, 2018 in Ottawa. Two moderated panels were composed of 12 speakers from politics, environmental law, academia, non-profits, and First Nations communities. The panels addressed the current landscape of water governance in Canada, the position of Canada's freshwater resources globally, the Indigenous perspective, the threat to freshwater in Canada, and the challenge to engaging Canadians around this issue.

The symposium sought to untangle the steps to developing a framework for a true "National Vision for Water in Canada." Elements of the Vision include: collaborating with First Nations communities on the next steps, enabling and updating existing legislation such as the 1970 Canada Water Act, engaging Canadians about fresh water resources, and positioning our water supply on a global level.

Speakers included: Nick Reid, executive director, Ryerson Urban Water; Courtney Bridge, graduate student, Simon Fraser University; Zafar Adeel, professor, Resource and Environmental Management at Simon Fraser University,

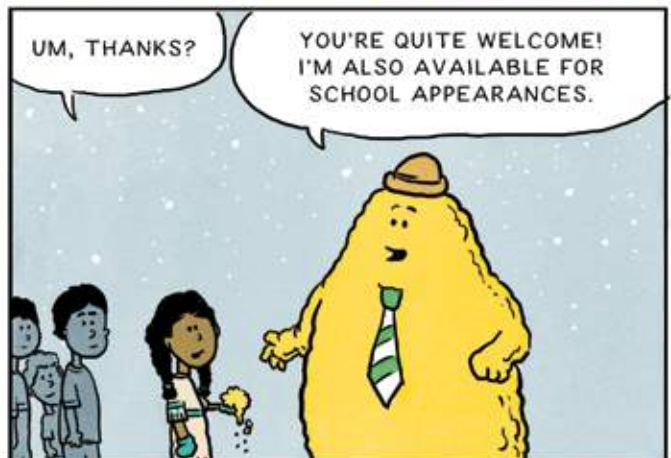
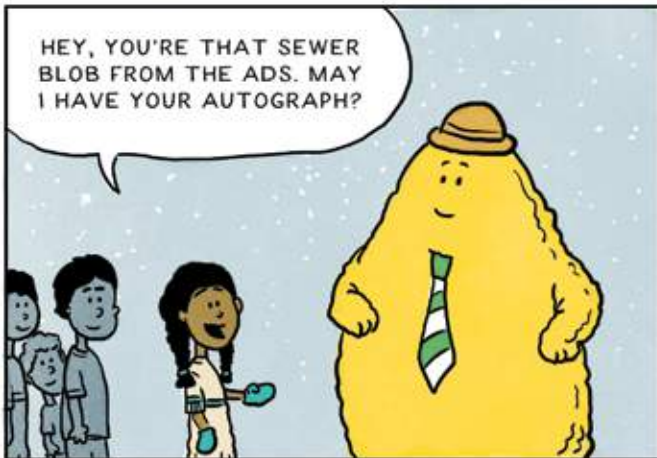
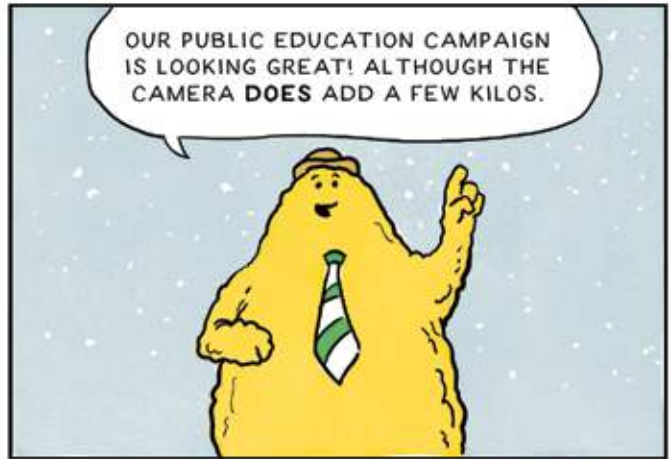
and executive director, Pacific Water Research Centre; Banu Örmeci, professor and Jarislowky Chair in Water and Global Health, and Canada research professor, Carleton University; Larry Swatuk, director, Master of Development Practice, and associate professor, School of Environment, Enterprise and Development at the University of Waterloo; Merrell-Ann Phare, executive director, Centre for Indigenous Environmental Resources; Irving Leblanc, director, Housing, Infrastructure & Emergency Services, Assembly of First Nations; Elizabeth Hendricks, vice president, Fresh Water Program, WWF Canada; Jeff Hall, professor in the School of Civil Engineering, Queens University; Nancy Goucher, knowledge mobilization specialist, Global Water Futures, Water Institute, and University of Waterloo; Francis Scarpaleggia, Member of the Canadian Parliament for Lac-Saint-Louis; Julia Baird, assistant professor, Environmental Sustainability Research Centre at Brock University; Ogimaa Kwe (Chief) Linda Debassige, M'Chigeeng First Nation; and, Lisa Prime, principal consultant, PRIME Strategy & Planning, and Ryerson Urban Water Advisory Board Member.

— Angela Murphy, Ryerson Urban Water

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STORY & DRAWINGS BY NATHAN T. WRIGHT



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Nathan T. Wright is a freelance illustrator and artist based in Des Moines, Iowa, USA.

International Water Cooperation for a Resilient and Sustainable Future

BY THE CONSULATE-GENERAL OF THE KINGDOM OF THE NETHERLANDS IN TORONTO



Prime Minister Justin Trudeau welcomed his Dutch counterpart Mark Rutte in Ottawa on October 25. A visit that strengthened the strong historical ties and the amicable relationship between the two countries, and reinforced the shared commitment to building a resilient future for all. The Netherlands announced to endorse the Canada-led Ocean Plastics Charter in the fight against ocean pollution, whilst Canada announced to join the Netherlands in the Global Commission on Adaptation. This new initiative, spearheaded by the Netherlands and chaired by former UN Secretary General Ban Ki-moon, is aimed to catalyze a global movement to bring scale and speed to climate adaptation solutions. These actions are in line with the COP 21 Paris Agreement, the recently released UNFCCC 1.5 report and of course, the United Nations' 2030 Agenda for Sustainable Development. They all serve as a blueprint to make the world a better place by 2030.

Dutch expertise on water management

Ensuring availability and sustainable management of water and sanitation for all, is one of the Sustainable Development Goals (SDGs) and it is in the connection with all other SDGs that water makes the difference. "Water is crucial to the world, to everyone. Understanding water

challenges and integrating the social, economic, environmental and cultural values of water into an inclusive comprehensive approach will ensure peace and security, health and equality, a good economy, sustainable urbanization, and a rich ecology, cooperation and innovation" says Henk Ovink, Special Envoy for International Water Affairs for the Kingdom of the Netherlands. "If we fail in doing so, all of the above will collapse, and unfortunately, it happens far too often in too many places around the world. Living with water means that you are often challenged by it, but water also offers big opportunities, it is the leverage for real sustainable change. And it is not just what you do, but more so how you approach water. Our Dutch water-culture is built around cooperation and innovation."

A cooperation that transcends borders, as Dutch companies provide their water-related services on a global scale.

In Canada for example, Dutch dredging companies provide their extensive knowledge and world-class expertise for various projects.

Ovink, who is also a Sherpa to the High Level Panel on Water of the United Nations, travels around the world to share the Dutch expertise on water

management with third countries, including Canada. Upon the 2015 Canadian-Netherlands Resilient Cities summit, Ovink was appointed member of the strategic advisory body for Waterfront Toronto. Moreover, he advises the City of Vancouver with their new to be developed resilience challenge.

Canada's Catastrophe Conference

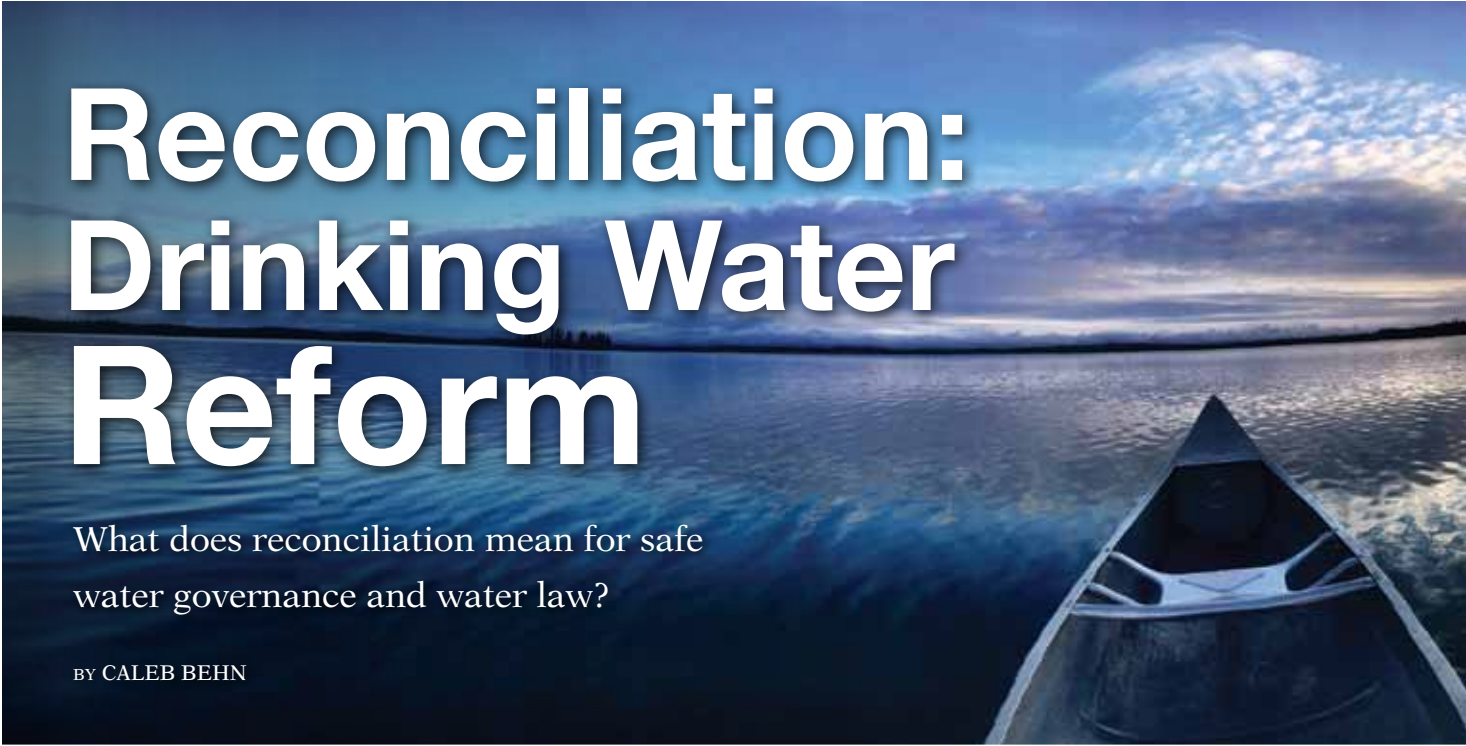
His next visit will be for Canada's Catastrophe Conference in Toronto (February 4-6 2019), where he will participate in a fireside chat and connect with stakeholders from government, private sector and knowledge institutions. Ovink: "90 Percent of all disasters is water-related and the climate challenge is enormous. Cities, governments, companies, researchers, all must learn from past disasters. A disaster is like an X-ray: it exposes the vulnerabilities of our infrastructure and society. Technology and innovations are important, but will not suffice. It is a matter of connecting

"We have no choice, better, it is our best chance for an amazing future!"

head and heart, it is about the way we work. To begin with, we must dare to understand the complexity of the problems, we must look ahead, the future should be our reference not the past. No silver bullets but comprehensive approaches. And we have to learn to radically work together and work across borders. Prevention pays, our economists, academics and insurers agree. We must dare to step up to that future and mitigate and adapt. Safeguarding our economies, our planet and people. We have no choice, better, it is our best chance for an amazing future!"



Henk Ovink is the Special Envoy for International Water Affairs for the Kingdom of the Netherlands.



Reconciliation: Drinking Water Reform

What does reconciliation mean for safe water governance and water law?

BY CALEB BEHN

Reconciliation means “...that if you are a child living on reserve, you should be able to turn on the tap and have clean water come out. Water that you can drink, and bathe in, without fear.”

— Right Honourable **Justin Trudeau**, Prime Minister of Canada (speech to the AFN on December 6, 2016)

THESE WORDS of the Prime Minister reflect a dark truth; the mismanagement of water infrastructure for First Nations is a shameful part of Canada’s past. Yet it also holds lessons for the future.

Currently, there are long-term drinking water advisories in dozens of First Nations communities affecting approximately 45,000 First Nations citizens who do not have access to safe drinking water or adequate sanitation.

This despite the United Nations General Assembly reaffirmation of the human rights to water and sanitation in 2015 by saying that they “...entitle everyone, without discrimination, to have access to sufficient, safe, acceptable, physically accessible, and affordable water for personal and domestic use and to have physical and affordable access to sanitation, in all spheres of life, that is safe, hygienic, secure, and socially and culturally acceptable and that provides privacy and ensures dignity.” First Nations know all too well why these rights are critical.

The Assembly of First Nations (AFN), instructed by Chiefs who are informed on the state of First Nations water and wastewater infrastructures, operates with the view that water is more than a commodity or a “resource to be managed.” Rather, water is a sacred relation and a transcendent gift. Traditional ceremonies, spiritual teachings, First Nations laws, and the most up-to-date scientific inquiry all converge on this truth: water is life.

The question that confronts the AFN is how to chart its course to advocate for safe and secure water sources for the future. While there are human rights to water and sanitation from a First Nations perspective, “rights” and “responsibility” are innately connected. It is not just the violation of rights that is the problem, it is also the removal of the ability to fulfill First Nations responsibilities as stewards of the land and water that are at issue as well. The era of “reconciliation” involves creating significant improvements throughout society as governments and institutions

step forward and step up to implement reconciliatory calls to action and to ensure that policies and laws are aligned with the United Nations Declaration on the Rights of Indigenous Peoples.

What does reconciliation mean for water governance and water law?

Thirsty for regulation reform

National Chief Perry Bellegarde has defined his time as National Chief with three simple words: “closing the gap”. The questions often given in response by government have been how, when, and for how much?

On World Water Day 2018, Chief Bellegarde emphasized this view: “Water is sacred for First Nations and key to a healthy environment and the health and well-being of all living things. Yet too many First Nations are living at risk with no access to clean water. It affects our health, education, and livelihood. This is unacceptable in a developed country like Canada. The federal government’s goal of ending all

There has been widespread opposition to the SDWFNA due to a lack of consultation, a lack of funding for its implementation, and a lack of consideration for the needs of First Nations.

The natural environment of the territory of the Dish With One Spoon, shared Anishinaabe, Mississaugas, and Haudenosaunee territory, keeps the author motivated to fight for better water regulations.

drinking water advisories in First Nations by 2021 is clearly a challenge, but we can achieve it by working together in a spirit of partnership and reconciliation.”

The gap in understanding and the gap in resources has contributed to the First Nations drinking water situation in Canada. But as problems arise, so do the opportunities for progress.

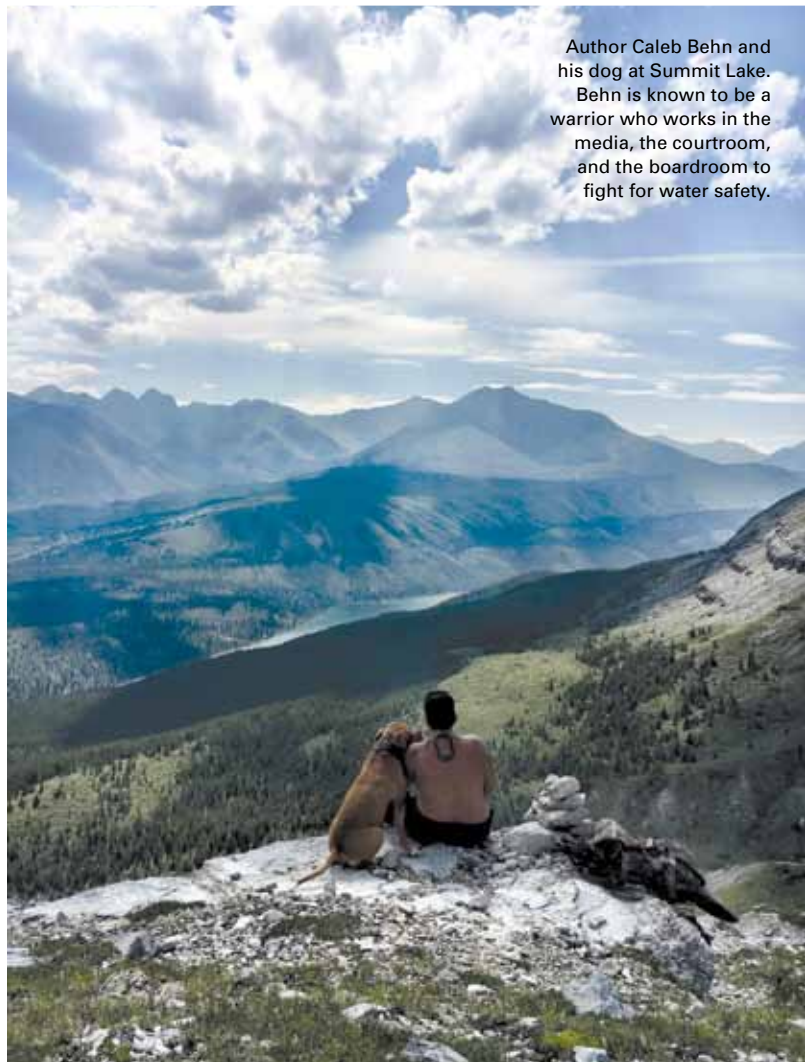
Many remember the Walkerton drinking water contamination tragedy of 2000 and what followed. Some will also remember the Expert Panel on Safe Drinking Water for First Nations and the recommendations to government. Summarized simply, they were: address the critical issues first, fund it properly, and work with First Nations to develop the answers. None of this occurred.

Instead what was introduced to First Nations in 2013 was unhelpful in spite of the name: the *Safe Drinking Water for First Nations Act* (SDWFNA).

The SDWFNA came into effect November 1, 2013. The Act was designed to enable the government to develop enforceable federal regulations to ensure access to safe, clean, and reliable drinking water and to better manage the effective treatment of wastewater and the protection of sources of drinking water on First Nations lands.

As it stands now, the Act allows the Government of Canada, in collaboration with

Author Caleb Behn and his dog at Summit Lake. Behn is known to be a warrior who works in the media, the courtroom, and the boardroom to fight for water safety.



Drinking Water Advisories



Progress on lifting long-term drinking water advisories.

Indigenous Services Canada recently released an update on its progress in ending long-term drinking water advisories on reserve among First Nations.

“More progress was made in our government’s commitment to lifting all long-term drinking water advisories on public systems on reserve,” said Minister of Indigenous Services Jane Philpott.

Minister of Indigenous Services. “Three long-term advisories were lifted, with 74 having now been lifted since November 2015.”

The federal government continues to work towards ending the remaining 67 long-term advisories, closing the gap in water and wastewater infrastructure, and preventing further short-term advisories from becoming long-term.

Quick facts

- A drinking water advisory becomes long-term when it has been in place for over a year.
- There were 105 long-term drinking water advisories on public drinking water systems on reserve in November 2015. As of October 31, 2018, 74 of these advisories have been resolved and 36 have been added. Working in collaboration with First Nations, the Government of Canada has committed to ending all long-term advisories on public systems on reserves by March 2021.
- Budget 2016 provided \$1.8 billion over five years toward water and wastewater infrastructure. These investments have supported 468 water and wastewater projects in 580 First Nations, serving 458,000 people.
- Budget 2018 provided an additional \$172.6 million over three years to help accelerate progress on lifting drinking water advisories and to ensure more infrastructure projects can be completed prior to 2021. Budget 2018 also proposes support for repairs to high risk water systems, recruitment, training and retention initiatives, and the establishment of innovative First Nations-led service delivery models.

First Nations, to develop federal regulations to ensure:

- Access to safe, clean and reliable drinking water;
- Effective treatment of wastewater; and
- Protection of sources of drinking water on First Nations lands.

The SDWFNA, in its current form, focuses on 11 essential regulatory components:

- 1 Protecting sources of drinking water from contamination.
- 2 Location, design, construction, modification, maintenance, operation, and decommissioning of drinking water and wastewater systems done according to applicable standards and by licensed individuals.
- 3 Distribution of drinking water and collection of wastewater by truck by a licensed professional in approved containers.
- 4 Training and certification of operators who have undergone an operator certification process.
- 5 Treatment standards that meet drinking water quality standards based on the Canadian Drinking Water Guidelines.
- 6 Monitoring, sampling, and testing via accredited laboratories and meeting minimum requirements for monitoring of drinking water quality and wastewater quality including frequency of sampling and testing, methods to be used, and reporting of adverse test results.
- 7 Collection, recording, and reporting of information with minimum requirements for collection, recording, reporting, and retention of information related to drinking water quality, wastewater treatment, and effluent quality.
- 8 Handling, use, and disposal of wastewater treatment products meeting requirements for the disposal of wastewater treatment products such as solid wastes, sludge, and bio-solids.

For further information, visit canada.ca/water-on-reserve

9 Emergency measures in response to the contamination of drinking water including duties to report potential drinking water quality contamination or illness events and duty to inform and take action if a malfunction or event might affect the drinking water quality, or the quality/quantity of discharged effluent.

10 Mechanisms and verification of compliance with the regulations including enforcement.

11 Appeal mechanisms stipulated in regulations that would require a mechanism for appeals, such as appeal tribunals, and the right to appeal provides a mechanism to assure some checks and balances with appropriate public involvement around regulatory decision-making.

However, those with legal backgrounds or Indigenous knowledge are especially offended by the clause that illustrates the paternalistic and colonial mentality that pervades the legislation:

S. 7 – Regulations made under this Act prevail over any laws or by-laws made by a First Nation to the extent of any conflict or inconsistency between them, unless those regulations provide otherwise.

This clause does not reflect reconciliation. And the intentional evisceration of First Nations water laws and legal orders does not reflect the Prime Minister's words that "[N]o relationship is more important to me and to Canada than the one with Indigenous Peoples."

Since its proposal and adoption there has been consistent and widespread opposition to the SDWFNA due to a lack of consultation, a lack of funding for its implementation, and a lack of consideration for the needs of First Nations. In 2017, the Crown thought that it could amend this law into compliance with the Constitution and with the needs of First Nations, and again there was widespread opposition.

The SDWFNA purports to enable

the government to develop enforceable federal regulations to ensure access to drinking water, the treatment of wastewater, and protection of source water on First Nations lands. These regulations can be unilaterally developed and passed by the government at any time and represent an active threat to First Nations rights and title and governance. The SDWFNA was widely resisted and calls for its repeal were put forward by the AFN, the Chiefs of Ontario, the Union of BC Indian Chiefs, and the Federation of Saskatchewan Indian Nations (now the Federation of Sovereign Indigenous Nations) amongst others.

Resolutions on the horizon

Four Resolutions have been passed by the Chiefs-in-Assembly since 2017 mandating the AFN to seek repeal and replacement of the SDWFNA. Resolution 01/2018 mandates the AFN to aggressively pursue repeal and replacement of the SDWFNA utilizing a co-development process, but

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the opportunity to accomplish this before the federal election was lost.

A Chiefs Committee on First Nations Safe Drinking Water Legislation is being appointed to support and advise the AFN throughout the process of co-development of replacement legislation. Resolution 26/2018 mandated the AFN to proceed with national engagement with all First Nations on what the replacement legislation should include. This will be conducted throughout the fall of 2018 and early winter of 2019 utilizing the “Preliminary Concepts” document that was endorsed by the Chiefs-in-Assembly at the July 2018 Annual General Assembly as well as a forthcoming discussion paper.

The second National Water Symposium, hosted by the AFN, from February 26 to 28, 2019, in Niagara Falls expands on this dialogue. The end result of all of this work will be a co-developed Draft Framework for the new legislation.

The intention is to advocate to have this legislation passed by government during which formal consultation with First

Nations—the rights holders—will occur. Once the federal legislation is passed in early 2020, a co-drafting process for regional regulations will need to occur across all regions to create the necessary regional regulations, approaches, and structures for implementation.

A First Nations Water Commission is also under consideration. Resolution 74/2015, First Nations Water, Infrastructure and Housing Commission, directs the AFN to “support the establishment of a First Nations Water, Infrastructure and Housing Commission.”

Despite the dissatisfaction with the SDWFNA, the AFN, and many First Nations commend Prime Minister Justin Trudeau and Minister of Indigenous Services Jane Philpott, for their work to remove many long-term drinking water advisories (LT-DWAs) plaguing First Nations.

Looking forward, Canada’s water community must be mindful that reconciliation is about more than human-to-human interactions. Reconciliation can be a way for us to

transcend the anthropocentric lens, particularly embedded in our legal system, and reconcile our contemporary circumstances with natural law, Indigenous laws, and legal orders.

We must think beyond what used to define our relations and courageously chart a shared course. The AFN is working to build the legal space for that to occur in the context of water with federal counterparts, and is looking to the water community in Canada for partnership to help secure safe and sustainable water for all First Nations for the future. WC

Caleb Z. Behn is the special advisor – water with the Housing, Infrastructure and Emergency Services Sector, at the Assembly of First Nations in Ottawa. He is Eh-Cho Dene and Dunne-Za from the northwestern edge of Treaty No. 8.



To read a complete copy of the SDWFNA, visit bit.ly/SDWFNA

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Warrior Up for Water

Advocate **Autumn Peltier**
makes waves across the world

BY CONNIE VITELLO

AUTUMN PELTIER is a phenomenal 14-year-old from the Wikwemikong First Nation who has garnered national and international recognition for her advocacy work. She is a strong force in the fight for clean water for Indigenous communities in Canada. Her story is inspiring as are her plans for future.

Peltier is not your average grade nine student. This water warrior has made some significant strides and her resume is already full of amazing accomplishments.

In 2015 she spoke at a Children’s Climate Conference in Sweden. In 2016 she met with Prime Minister Justin Trudeau and as a result, he made a public commitment to better protect water in Canada. In 2017 she won a WE Day award for Youth in Action and was the only Canadian nominated for the 2017 Children’s International Peace Prize.

In 2018 she pumped up the volume: she participated in a panel at the Canadian Water Summit and at the Indigenous Women’s Summit; she was honoured by the Assembly of First Nations as a Water Warrior and as an Ontario Junior Citizen for her advocacy work; she received the Sovereign Medal for Exceptional Volunteerism from Lieutenant Governor 2018; and, last but not least, she jumped up on a stool to reach the podium and address the United Nations (UN) General Assembly.

Calling for action worldwide

Peltier’s address helped to launch the UN’s International Decade for Action on Water for Sustainable Development. She famously said that it’s time to “warrior up”

and stop polluting the planet. She asked world leaders to give water the same rights and protections as human beings.

“No one should have to worry if the water is clean or if they will run out of water,” Peltier said in her speech. “No child should grow up not knowing what clean water is or never know what running water is.” Her words were poignant. “We all have a right to this water as we need it—not just rich people, all people.”

The applause from the prestigious attendees was noted. According to Brenden Varma, spokesperson for the president of the General Assembly, it’s not common to see a 13-year old girl addressing the 193-member states of the UN and giving such a heartfelt address. He said it was amazing and that the audience was moved.

Even moved to action it seems. Louise Blais, deputy ambassador at the Canadian Mission to the UN, told CBC News that Peltier’s address was a “call to action” for nations around the world to protect water for future generations.

Born to be an advocate

At such a young age Peltier has already demonstrated strong leadership and has inspired people around the world to stand up and fight for environmental rights. But who was Peltier’s inspiration?

Growing up on Manitoulin Island, surrounded by water and Indigenous culture, her mother Stephanie Peltier raised her with a strong sense of her traditional culture, including water ceremonies. Peltier says she was also

inspired by her great-aunt Josephine Mandamin, who trekked the shores of all five Great Lakes to bring attention to water issues affecting Canada’s largest natural resource.

Future goals

Peltier’s current advocacy initiatives include speaking engagements for youth, women’s groups, ceremonies, leadership, committees, and councils. Her mother says they receive about one or two invitations per day, too many to fulfill.

In terms of future goals, Peltier plans to take political science at the university level, then pursue her law degree. But for now, they are trying to have her not travel too much so that she can focus on her first year of high school.

Peltier is determined to keep creating awareness in hopes of empowering more youth “to take a stand for mother earth and advocate for the sacredness of water.” She says she will continue to attend ceremonies and help whenever she can.

“We are the young leaders of tomorrow and we are inheriting this land and government. Our voices need to be heard, and we need to plan and protect our future and our land, our water, so we can have a future,” says Peltier. “I will continue with learning our ways as one day I will be a grandmother and I want to ensure my grandchildren have a planet to live on.” **wc**

Connie Vitello is guest editor of this edition of Water Canada magazine.



AdEdge's arsenic and iron removal system.



The building housing the AdEdge treatment system.



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System.



Training
of the
AdEdge
treatment
system
using
the PLC.

Arsenic and Iron Removal for the Resort Village of Kannata Valley, Saskatchewan

In November 2009, AdEdge Water Technologies, LLC was selected among other vendors in a Tender by the Resort Village of Kannata Valley (RVKV) to supply an arsenic, iron, manganese and turbidity treatment system for their community in Sifton, Saskatchewan. Prior to selection, AdEdge worked with its local representative, the Water Clinic on piloting the system that was chosen. The water system currently uses one 132 gpm artesian well that serves potable water to 260 connections. Several options were considered based on the need to remove the 1.7 – 2.14 mg/L iron and arsenic from 31 ppb to below the new MCL of 10 ppb. An AdEdge AD26 oxidation/filtration system was selected as the best overall approach to simultaneously remove both contaminants while having a small footprint. Work was closely coordinated with the RVKV and its consultant to design and permit the treatment system. Following award, all appropriate permitting documents were prepared and submitted to the Province

for approval with the permit granted in January 2010. The AdEdge scope of work included system design, supply and start-up assistance. The packaged AD26 system utilizes an NSF 61 Certified manganese dioxide media (AD26) that is excellent for co-contaminant removal. The technology was selected based on overall cost, the small footprint, and simplicity of operation.

The AdEdge AD26 arsenic treatment train consists of one skid mounted triplex packaged treatment systems with three vessels in parallel to treat up to 150 gallons per minute (gpm). A design filtration rate of 3.98 gpm/ft² was chosen to allow for filtration of the high level of contaminants including turbidity in a range of 6.34 – 12.0 NTU. The AD26 automated system equipped with a PLC, automated butterfly valves, and control panel is integrated with chlorine addition and monitoring for process control and disinfection purposes. The system also includes air wash and complete backwash

recycle, providing a treatment system with zero discharge. The system is pre-engineered, pre-piped, and skid mounted for ease of installation and operation. A continuous free chlorine monitor on the system allows the operator to maintain desired disinfection residual in the distribution system. The AD26 technology has been deployed successfully by AdEdge on many high arsenic, iron, and manganese wells to date rated up to 15 MGD and also on 5 full-scale EPA arsenic demonstration projects.

Installation was completed and the system was officially started up in August 2010. Since operations began, the system has consistently met all the EPA MCLs for arsenic, iron, and manganese. Arsenic in the treated water has been recorded consistently below detection (<2 ppb) and Turbidity to 0.014 NTU. Monitoring and periodic sampling of the system is performed by the site's certified operator in accordance with the operating permit. ■



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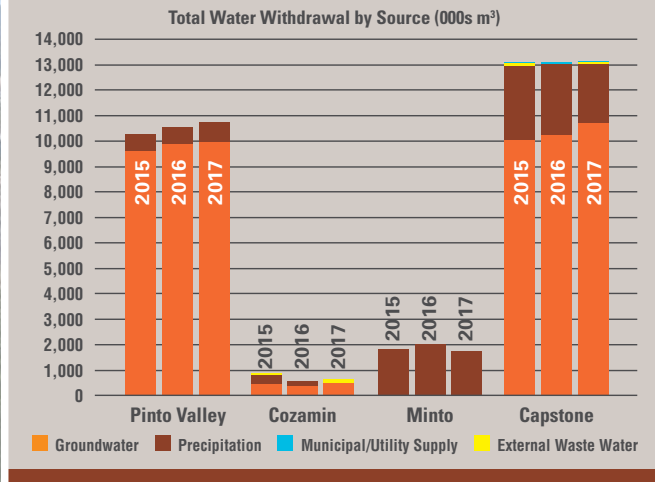


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Minto mine site in Yukon territory.

Water withdrawal by source type for Capstone mines



Proactive Approach

Selkirk First Nation and Minto Explorations release socio-economic impact report.

BY TODD WESTCOTT

THE SELKIRK FIRST NATION, Minto Explorations Ltd., and the Government of Yukon released a new report that provides a comprehensive look at not only the economic and environmental aspects of the Minto Mine, located in Pelly Crossing, Yukon, but also the socio-economic effects on local First Nations communities.

The Minto Mine Socio-Economic Monitoring Program’s 2015 Annual Report was released in August 2018. According to the executive summary, “the purpose of this report is to determine if, and how, the activities of the Minto Mine may be affecting Yukon, Selkirk First Nation citizens, and residents of Pelly Crossing.” Indeed, the evaluation lists the people’s connection to land and water as a metric.

“Monitoring and assessing the social, economic and cultural effects of Minto is of high value as it supports a proactive management approach where mitigation measures in these areas can be adapted, if required,” said Yves Brouillette, general manager of Minto Mine.

compliments the work of Minto Mine’s parent company, Capstone Mining Corp., in its annual sustainability reporting.

“A key example of long-term focus is Minto’s ongoing research into the use of a constructed wetland for passive water treatment in closure. Testing and refining closure planning assumptions during operations will help ensure future success,” said Brouillette.

According to a 2017 sustainability report, “Minto relies on precipitation and surface run-off as a water source, and typically has a surplus of water. Water management focuses on maintaining sufficient storage capacity on site, and minimizing the amount of water that needs to be treated.” Effluent discharge from the site is also regulated by the mine’s water licence. Capstone’s management of effluent is also governed by its engagement with Selkirk First Nation: “Water quality in Minto Creek related to potential impacts on fish is a concern of Selkirk First Nation.”

The survey collected socio-economic and socio-cultural information about living conditions.

“Minto and Selkirk First Nation work closely through a bilateral technical working group focused on development of closure water quality objectives, water treatment design, and routing of water conveyance ditches,” said Brouillette.

The Minto Mine Socio-Economic Monitoring program started in 2014. In addition to water quality, the three parties agreed to monitor the social, economic, and cultural effects of the Minto Mine with the cost of implementation shared among the three parties.

The 2015 report is the second annual report of the monitoring program. The third annual report will combine data for the 2016 and 2017 calendar years. wc



Todd Westcott is Water Canada’s content and marketing manager.

Mining data and trends

The annual socio-economic report provides baseline information and trends from the start of the mine’s life in 2005 until the end of 2015. This reporting

Focus on First Nations

A key feature of the socio-economic report is the inclusion of information from a household survey of 271 Selkirk First Nation citizens living in Pelly Crossing and other Yukon communities.



To read the complete report, visit selkirkfn.com/MintoMine_Socio-EconReport-2015

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Alouette River in British Columbia.



Alouette River Ecosystem Partnership brings together the Katzie First Nation, Kwantlen First Nation, the Alouette River Management Society, and BC Hydro.

A River Runs Through B.C.

First Nations partnership for ecosystem repair of Alouette River. BY CHERYL ASHLIE

IN THE ALOUETTE WATERSHED in British Columbia, water runs from the mountains and ridge tops into the local ponds, streams, and lakes. The water eventually flows into the Alouette River, then into the Pitt River and Fraser River before finally reaching the Pacific Ocean.

The Alouette River was awarded Heritage status in 1998 under the BC Heritage Rivers System (BCHRS). The BCHRS is the first provincial system of its kind in Canada and helps to promote stewardship of this natural legacy.

A water use planning review process for BC Hydro's Alouette Project was initiated in May 2005 and completed in August 2006. It involved a review of all data collected since implementation of the September 1996 Alouette Project Water Use Plan, and an assessment of new knowledge in the basin. The assessment included noting changes in resource values and a refinement in proposed conditions for the operation of BC Hydro's Alouette Project.

The proposed conditions in the 2009 Water Use Plan for the operation of BC Hydro's Alouette facilities reflect the consensus recommendations of the August 2006 Alouette Project Water Use Plan Review Consultative Committee Report. The conditions for the operation of BC Hydro's Alouette Project facilities are tied to the *British Columbia Water Act*.

Power in partnership

The new Alouette River Ecosystem Partnership (AREP) was recently created to improve the water resource management of the Alouette River and surrounding ecosystems in Maple Ridge, British Columbia. The partnership is made up of the Katzie and Kwantlen First Nations, the City of Maple Ridge, and the non-profit environmental organization Alouette River Management Society.

The Alouette River Management Society (ARMS) was formed in 1993 by dedicated citizens who recognized there needed to be a strong community voice to advocate for the restoration and protection of the Alouette River and its watershed that had been severely impacted by the construction of the Alouette Dam system, which was completed in 1928. ARMS already had a long-standing relationship with Katzie First Nation doing projects within the watershed, so when the City requested a meeting to discuss working with them and both Katzie and Kwantlen, it was a natural progression.

ARMS is proud of the work it accomplishes as a non-profit organization that relies on volunteers and only two staff members. However, the work that is before them to protect and enhance the Alouette River requires a greater effort and so they are eager to

join with the Katzie and Kwantlen First Nations and the City of Maple Ridge in this historic agreement.

On November 20, 2018 Maple Ridge's newly-elected Council was briefed on the AREP and expressed their commitment to moving this partnership forward, which was initiated by the previous council. The four parties are now set to work to improve the state of the Alouette River ecosystem in a more collaborative and united way through the AREP agreement.

The partners aim to build constructive outcomes with BC Hydro and the provincial government, with the goal of restoring salmon runs and repairing ecosystem damage created by the damming and alteration of the Alouette River on the traditional lands of the Katzie and Kwantlen First Nations over the past century.

"Katzie First Nation is looking forward to working collaboratively with the Alouette River Ecosystem Partnership. The vision of restoring the water and ecology surrounding the Alouette is so important. It reassures that we are truly thinking about the next generations. Building this understanding together is a beautiful measure and will create positive outcomes for all species, including us," said Chief Grace Cunningham of the Katzie First Nation.

Tumia Knott, councillor of Kwantlen First Nation is similarly enthusiastic. “The Kwantlen First Nation is excited about the opportunity to work collaboratively and respectfully with our partners to develop new ways to give renewed health to the Alouette ecosystem for future generations.”

BC Hydro plans to submit their water licence application to the provincial Comptroller of Water Rights this fall to secure perpetual water rights over the Alouette Lake and River. Currently, BC Hydro has perpetual water licences for two of three water licences granted to operate the Alouette and Stave generating systems. Water licence 124724 expired on December 31, 2018 and BC Hydro intends to apply for a perpetual water licence, which all members of AREP are opposed to.

Fishing for next steps

AREP seeks direction from the Comptroller of Water Rights, or formal commitment from BC Hydro, to the

restoration of the seven species of Pacific Salmon and the creation of permanent fish passage at the Alouette River Dam.

The goals of the Alouette River Ecosystem Partnership are to:

- Create a functional watershed ecosystem in the Alouette River area that restores all seven species of Pacific Salmon;
- Provide a scientifically sound and functional fish passage that reconnects the watershed above the dam with the river for the benefit of all species of salmon and freshwater fish;
- Protect and enhance the current freshwater species;
- Enhance wildlife resources in the ecosystem;
- Develop recreational and educational opportunities with BC Parks and other partners.

“The Alouette Watershed represents a significant resource for our community. Our partners with the Katzie First Nation and Kwantlen First Nation have helped educate us on the historical and cultural significance of the ecosystem. The environmental stewardship by the dedicated ARMS volunteers has demonstrated what is possible in fish and wildlife restoration. We trust that BC Hydro sees the benefits in supporting the goals of the partnership in our community and for their customers around the province,” said Maple Ridge Mayor Mike Morden.

AREP has sent letters to both the Comptroller of Water Rights and BC Hydro requesting meetings on this important matter and look forward to ensuing discussions. WC



Cheryl Ashlie is the president of the Alouette River Management Society in Maple Ridge, B.C.



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Unique in North America and one of only a handful of programs of its kind in the world, the TCBR is on the cutting edge of research and technology development that will transform our world. Working to create a more sustainable future is at the heart of the work being conducted with a focus on development, agricultural utilization and geographical, environmental and commercial impacts.

175

The number of students graduating per year with their undergraduate degree in Environmental Science/Studies at Trent University.

151

The number of lakes found in Peterborough & the Kawarthas.

85

The number of acres set aside for the development at Canada's Premier Cleantech Destination – Cleantech Commons at Trent University.

50

The number of years Trent University has worked to establish itself as one of Canada's top post-secondary environmental institutions.

1

Peterborough-Kawartha-Haliburton designated as a Regional Centre of Expertise for Sustainable Development by the United Nations University as endorsed by UNESCO – 1 of only 8 RCEs in Canada.



Green infrastructure at work at a roadside rain garden in Peterborough, Ontario, installed by Peterborough Green UP in 2018.

Flood Resilience

Communities come together to tackle urban flooding.

BY CLARA BLAKELOCK

IT DOESN'T TAKE MUCH CONVINCING to believe that flooding is a big problem in Canadian communities. The insurance industry has been sounding the alarm for years.

But what can be done about it? Much of the flooding that occurs isn't in riverine flood plains—it's urban flooding, which occurs away from waterbodies due to overloaded stormwater or wastewater systems.

Urbanization has greatly increased runoff volumes compared to pre-development. The most vulnerable neighbourhoods are those built years ago, when design standards were different. There are also many factors on private property which impact risk. And when rain events are very large and intense, almost nothing can prevent flooding from occurring.

It's not a problem that can be solved by municipal infrastructure improvements alone. All levels of government, conservation authorities, academia, the private sector, and the public all need to work together.

Helping develop strategic solutions

Over the past several years, Green

Communities Canada, with support from the Ontario Trillium Foundation, has been facilitating the Ontario Urban Flooding Collaborative. This multi-stakeholder group aims to help define what it means to be a flood-resilient community, to identify how we will measure progress towards flood resilience, and to generate projects which will improve flood resilience in communities across the province.

Their vision of flood-resilient Ontario communities includes four areas:

- **Prioritize:** Plans are in place to reduce flood risk, addressing the most vulnerable neighbourhoods first.
- **Prepare:** Property level measures are in place to reduce flood risk, while minimizing downstream impacts. People prepare for the event of an emergency.
- **Protect and restore:** Runoff is minimized.
- **Improve:** Infrastructure protects all properties from flooding.

Communities are working in all of these areas, but face many challenges. With the collaborative, we aim to implement projects to try to address these gaps.

The most vulnerable neighbourhoods are those built years ago, when design standards were different.

One challenge is that public understanding of flood risk is very low. While even riverine flood risk is not well-understood, a recent survey by Partners for Action (formed by the University of Waterloo's Faculty of Environment) found that only six per cent of people living in high risk riverine flood zones knew they were at high risk, and that the urban flood risk is even less well known, because in many communities it is not mapped. Municipalities are working on creating these risk maps, but there is trepidation about releasing this information to the public, for

fear that it will lead to accusations of negligence, or impact property values.

Mapping out the solutions

The only way that needed infrastructure investments can be made is by having an open conversation with the public about the current condition of infrastructure, what improvements are possible, and what they would cost.

The City of Edmonton is currently undergoing this process, and has mapped urban flood risk and engaged the public about what their priorities are for reducing risk. One of our proposed collaborative project involves partnering with different communities that are undergoing flood risk mapping to test out different communication and public engagement strategies.

Once flood risk is understood, there are actions that can be taken at the property level to reduce risk. Many municipalities provide subsidies for basement flood prevention (backwater valves, sump pumps), but

uptake is generally low. There are also gaps in the quality of work that is done on private property. We are proposing to test out innovative approaches to incentivizing or requiring action on private property, while also providing training to practitioners in holistic flood resilience, to increase the quality of work that is installed on the ground.

Increasingly, green infrastructure, such as rain gardens, permeable pavement, and rainwater harvesting is being used for stormwater management within urban areas, an approach supported by the Government of Ontario.

However, green infrastructure alone won't solve all flooding issues in at-risk neighbourhoods. It is part of a holistic approach to stormwater management, using the best approaches from the smallest to the largest rain events. This is a new approach for many communities, and there are still some challenges with widespread implementation.

Green Communities Canada aims to address these barriers through demonstration neighbourhood retrofits which combine grey and green infrastructure improvements, and flood protection measures on private property. These neighbourhoods will serve as demonstrations of what is possible in flood-resilient communities. WC



Clara Blakelock is the manager of water programs for Green Communities Canada.



Green Communities Canada launched the Youth for Water program in 2017.

Youth for Water bridges traditional Indigenous knowledge and culture with science and environmental issues for youth aged 18-25. For further info, visit

greencommunitiescanada.org/youth-for-water

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Interns pose with Minister Hajdu after a tour of the M'Chigeeng First Nation water treatment plant.



Eric Vautour, from Sheguiandah First Nation, calibrates equipment in order to test the water around his community's drinking water intake.

PHOTO: WATERCANA



Interns collect surface water samples in West Bay on Manitoulin Island.



Interns with program partners during the Graduation ceremony at the Aundeck Omni Kaning Pow Wow Grounds.

Water First

Providing employment opportunities for First Nations youth to succeed in the water industry.

BY EMILY WORTS

WHEN JOHN MILLAR, executive director and founder of Water First, attended a national water conference focused on First Nations water issues he was shocked at the lack of representation by Canadian NGOs. At the time Millar was running a charity addressing global water issues, specifically in Uganda.

"I went to a conference in Toronto for water projects abroad and there were hundreds of people from dozens of Canadian NGOs," recalls Millar of the conference in 2013.

A few months later, he attended the water conference in Ottawa, expecting to again find dozens of Canadian NGOs, this time addressing First Nations water

issues. He found none. "There were many government, industry, and First Nations representatives present, but there were virtually no Canadian NGOs," says Millar.

At the conference, Millar spoke with Indigenous representatives from coast to coast to coast and enquired as to what kinds of NGO programs were available to them and found none.

Millar returned to his office in Creemore, Ontario and started exploring ways to support First Nations communities with water challenges. He partnered with Carleton University and began working on a baseline water quality study in partnership with Shawanaga First Nation, identifying an intake site

for their future water treatment plant.

"Within three years our First Nations work became 90 per cent of what we were doing so we changed the organization name to Water First (from Tin Roof Global) with an exclusive emphasis on First Nations water challenges," says Millar.

Since then the organization has collaborated with more than 50 First Nations communities. They have worked in Ontario, Quebec, and Labrador and are currently building relationships in Manitoba.

Their latest effort, the Water First Internship program, began with all seven First Nations on Manitoulin Island in the spring of 2017, and aims to increase

the local pool of water treatment plant operators. The internship was piloted in partnership with the United Chiefs and Councils of Mnidoo Minsing (UCCMM), Wiikwemkoong Unceded Territory, and the Anishnabek Union of Ontario Indians, with funding from Employment and Social Development Canada.

In August 2018, 10 successful interns graduated from the two-year program and began careers in water treatment and environmental science, or were inspired to continue studying water at the post-secondary level. The internship helped interns acquire necessary certification to begin a life dedicated to the stewardship of their community's health and well-being.

Inaugural Water First interns



The Water First Internship means **Chelsea Antoine** Debassige, 24, can work in her home community, Zhiibaahaasing (the most remote area on Manitoulin Island). She is currently the project coordinator for Swim Drink Fish Canada in Zhiibaahaasing, a position she wouldn't have been able to obtain without the experience she gained during the internship.



"As I'm getting older, I'm starting to think about the generations that are coming. This is important work," says **Chris Wemigwans**, 46,

of the Water First Internship. With the hands-on experience and knowledge he gained through the internship, he is now working for his home community, Aundeck Omni Kaning (AOK), as an operator in training (OIT) at the local water treatment plant.



Post-secondary education took **Alex Nahwegahbow**, 23, away from Whitefish River First Nation but he struggled with the necessity of being so far away from home. The internship allowed him to

study in his home community and with his OIT and Water Quality Analyst (WQA) certification he is now working for the Ontario Clean Water Agency in Espanola, Ontario, less than 20 minutes from his home community.



Naomi Mandamin, 32, has been fascinated with science for as long as she can remember. "I've always wanted to work in a lab," she says.

The scope of Water First's training—from testing for chlorine, hardness, alkalinity and turbidity to microbiological analysis, and surface water sampling—is right up her alley. Mandamin is now working as the environmental coordinator for UCCMM.



Paige Manitowabi, 29, is excited to take what she learned as a Water First intern and combine it with her growing interest in

traditional Anishinaabe ways. That mix of knowledge, she believes, could be the key to solving many issues. Manitowabi is currently combining her passion for water and the environment as the environmental field technician at Wahnapiatae First Nation.



Alex Cartagena, 30, a father of two, is excited by the prospect of gainful employment the internship offers.

Before the internship he worked for a quarry and when it shutdown, his bills went unpaid. Tired of underemployment and armed with his WQA certification and GED he now works at his local plant part-time.



"For our culture, water is life. It's important, and I try to teach my son the same," says **Amy Waboose**, 23. She recently accepted a

full-time position at her local water treatment plant and is a youth representative on the Whitefish River Source Water Protection Committee.



Dallas Goodfellow, 25, was born in Sault Ste. Marie, and moved to AOK when he was in Grade 3. The Water First Internship inspired him

to continue his education and he is now enrolled in the pre-trades program at Cambrian College and hopes to eventually obtain a diploma in civil engineering or environmental science.



Cassidy Beaudin, 20, plans to turn his Water First Internship experience into a job as a treatment plant operator.

Cassidy obtained both his OIT and WQA certification and is looking forward to taking on the everyday tasks that are part of the job, from sampling to tapping into water lines to cleaning out holding tanks. He sees a bright future in the field.



The Water First Internship offered **Eric Vautour**, 25, an opportunity to enhance previous knowledge and grow his passion for

activism. He is working as an environmental technician/OIT in his home community and splits his time between the water plant and working on environmental projects, like his community's source water protection plan. "This Internship has taught me more about the situation of clean water in our province. I didn't know how many First Nations communities were without clean water. I really want to change that in the next few years," he says. (See page 28 for more details about Eric.) wc



Emily Worts is a writer based in Creemore, Ont.



For further information on the Water First intern program, visit waterfirst.ngo/our-projects/water-first-internship

Water First Grad

Star student **Eric Vautour** explains his training and how he's equipped for the future.

MY NAME IS ERIC VAUTOUR and I am from Sheguiandah First Nation on Manitoulin Island, one of seven communities to participate in the Water First Internship. Water First, a leading charitable organization working with First Nations communities to solve water challenges through education, training, and meaningful collaboration. This program allowed me to receive 15 months of paid training in a variety of engaging water science topics while living and working in my home community of Sheguiandah First Nation.

This unique experience incorporated a variety of workshops, hands-on training, on the job training, and incorporated Traditional Knowledge accompanied by Traditional Ceremony. During the program I was able to obtain provincial certification, learn on the land, teach young students in the classroom about water science, and connect with our community and Elders.

Background

I am grateful for everything water does. Water works in the world on many levels yet what we seem most concerned about is how water helps us physically. The Water First Internship has reminded me what water does for us mentally, spiritually, and emotionally as well. Most importantly the internship has helped strengthen my connection to myself, to others, and the world. The relationship that I share with water has been sacred ever since I was young. Attending many Traditional Ceremonies when I was a toddler, and later in my teenage years, nourished this relationship.

I was born and raised on Manitoulin,

close to water in both the literal and metaphorical realm, which shaped me in a very positive way. I had to move to Sudbury for a while, but the Water First Internship allowed me to move back to Manitoulin and the water. I wasn't sure what to expect from this pilot project, but when I learned it would bring me back to my home community and allow me to obtain provincial certifications, it was all the convincing I needed to be a part of this amazing journey.

Internship

The pilot program included a diverse group of interns. Some of us had extensive knowledge and experience working with water, while others had very little. Some were parents, while others were fresh out of school. Others, like myself, were still finding their place in the world. The first week was spent together completing a prep course for our Water Quality Analyst (WQA) exam. Along with obtaining our WQA we also had the opportunity to obtain our Operator in Training (OIT) certificate. Due to our great success we were offered a chance to participate in a prep course for the entry level course for Drinking Water Operators. We also had the opportunity to participate in source water protection plan training which was being offered by the Ontario First Nations Technical Services Corporation. We accomplished what we set out to do and so much more.

There were six weeklong training

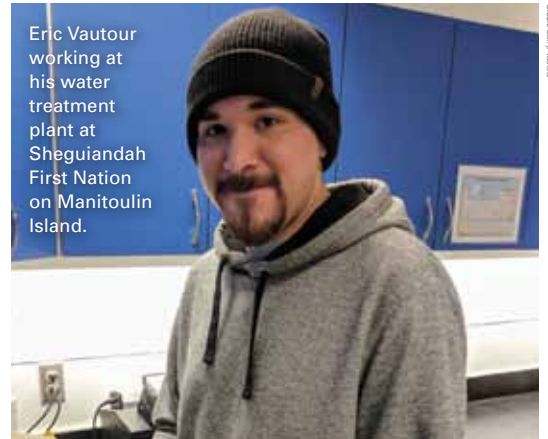
sessions throughout the Internship, all focusing on different themes. Each one was as good as the next. One memorable workshop had Traditional Knowledge Keepers sharing their stories. Another focused on mapping techniques, using GIS and ArcMap software. The most fun and impactful workshop for me was all about environmental monitoring, in which all the interns working collaboratively to collect five soil and water samples from each community. I looked forward to each and every workshop and their underlying focus on water. An added bonus of the workshops was the chance to see our fellow interns and engage with the Water First management team in person.

“Eric asked us to take a chance on him and he's worked very hard.”

— **John Millar**, executive director and founder of Water First

Many of us participating in the program were from different communities but the internship and our love for water unified us and created lasting bonds. I am excited to see this program put into place in other First Nation communities as I believe it is one crucial step in our walk towards a Canada free of boil water advisories. I feel honored every day to supply my community with safe and clean drinking water and I believe this is the field for me for many years to come. WC

Eric Vautour is a graduate of the Water First Internship program.



Eric Vautour working at his water treatment plant at Sheguiandah First Nation on Manitoulin Island.

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On a typical day, Andreeanne Simard has a hands-on, boots on the ground job where she is knee deep in the environment, measuring water levels, observing stream flows, and taking water samples.

Women in Water

Andreeanne Simard on female leadership and taking a plunge in the water industry. BY CONNIE VITELLO

WATER CANADA recently had an opportunity to ask Andreeanne Simard, one of the few female leaders in the water industry in Canada, about her passion and her job to maintain a safe and sustainable water supply. Simard provides insight into her career journey and how she made waves in the water industry to attain a top job.

Currently, Simard manages the spring water sources for Nestlé Waters Canada in Eastern Canada where she is responsible for the sustainable management and development of existing spring sources and leads the long-term monitoring program. She also investigates new spring sources and associated resource valuation and due diligence for the future growth and sustainable development of the company.

While she was raised in Quebec City, Simard did much of her schooling south of the border. She attained a Bachelor of Science degree in Geo-Environmental Engineering from Pennsylvania State University as well as a Masters and Ph.D. from the Michigan State University College of Civil and Environmental Engineering. Previous to Nestlé Waters,

she held a senior position in consulting, and served clients involved in hydrology, water treatment, water resources, and remediation.

But that's not the whole story. Simard is actively involved in her community, serving as a member of the Rotary Club of Guelph, Puslinch Optimist Club, and the local Friends of Mill Creek organization, while raising two daughters. She's a remarkable person and her story doesn't disappoint.

Women are making waves in the water industry more than ever before. Thanks to shifting economic trends and more business leadership training there are increased opportunities for female workers. However, according to Statistics Canada, women still only make up approximately 22 per cent of the total workforce in STEM (science, technology, engineering, and math) fields. What prompted you to take the plunge?

I have always been a person with a technical mindset and was drawn to the field of science from a young age. I've

lived by water for half my life and am a very hands-on person. I love working with people and being out in the field, interacting with the community. I knew that my work as a Natural Resources Manager would allow me to combine all these passions and take the plunge.

Tell us your hydrologist career path story. Where did you seek your education and training? Please include any early inspiration or aha moments that led you to dive deeper into the water industry.

When I was younger I considered becoming a lawyer, but realized that I would be missing out on the science aspect. I got a Bachelor of Science degree in geo-environmental engineering from Pennsylvania State University, and then a Masters degree and PhD from Michigan State University's College of Civil and Environmental Engineering. After completing my education, I worked as an engineering consultant, serving clients in hydrology, water treatment, water resources, and remediation—all water related.

What obstacles did you encounter along the way and how did you overcome them? For example, were there systematic forces at play or certain circumstances that made it difficult for you to become one of the only female natural resource managers in Canada?

Being one of the few women in my field at Nestlé Waters North America is definitely unique. I am used to working primarily with male colleagues, but I am lucky to work with such amazing people at Nestlé and I think being in this position has only made me stronger at my job.

Who is your favourite mentor or role model and how have they helped guide your success?

My mentor is my now 92-year-old grandfather. He also had a science background with a successful career as a civil engineer and is the hardest working man I know. Over the years, he has helped guide me through choosing my education and career path.

Describe a typical work day for you, from start to finish. For example, how much time do you spend out working in the wetlands versus meeting with coworkers and community members? Please also share any time management techniques and life-work balance strategies that you find helpful.

On a typical work day, you'll see me driving around in my pick-up truck, going to check on a monitoring location in our local watershed, talking to local community members or heading into a meeting with local stakeholders. You'll also see me attending meetings with members of government, those in the community and coworkers where I get to present the data collected in the field and explain what this data means. The variety of things that I get to do in a day is what makes this job so fulfilling to me. I find what really helps me to balance it all is spending quality time with my family, it really keeps me grounded.

What is your advice to young women (and men) starting out in the water industry? Provide a few guiding



Simard spoke at the 2018 Canadian Water Summit and participated in the panel discussion on reducing, reusing, and recycling water. Participants learned how best practices and accurate data help inform private sector water use.

principles related to developing or future opportunities in the industry.

My advice is to take advantage of as many opportunities as possible to learn about the industry, meet people, and have new experiences. Education is very important but it's also about making connections within the industry and getting involved wherever possible. In my job, I'm still learning new things every day. It's also important to find a company to work for that supports your passion, whatever it may be.

This edition of Water Canada magazine is focused on First Nations. Inform us about how Nestlé Waters Canada is working with Indigenous communities to carefully manage water quality in and around First Nations communities.

At Nestlé Waters Canada we work diligently to protect the health and sustainability of the water we share with a number of communities in the region, including local First Nations communities. We consult and engage with all levels of government, local, provincial, and First Nations on the work that we do and provide assistance to those who seek it. We have a good working relationship with a number

of First Nations communities and look forward to continuing this work for years to come.

Water watchdogs argue that the province is giving water bottling companies too long of a lead time to amend recent changes to renewal applications (they are calling for limited intake during periods of reassessment). They also criticize bottlers for not being as careful as they could be with water resources. How do you address these issues?

We support the Ministry's need to let science and fact dictate its decision-making process. I'm confident the government's data will support the scientific work Nestlé Waters has been conducting for years. Throughout the moratorium we will continue to operate legally and according to the rules set out by the Ministry of the Environment, Conservation and Parks. We will also continue to work with all levels of government, including our Indigenous partners to ensure the health and sustainability of the water that we all share. wc

Connie Vitello is guest editor of this edition of Water Canada magazine.



From left to right: Chief Aaron Sumexheltza, Chief Jordan Joe, Minister of Indigenous Relations and Reconciliation Scott Fraser, Chief Harvey McLeod, Chief Marcel Shackelly, and Chief Lee Spahan. Nicola Valley's five First Nation bands, in partnership with the Government of B.C., made waves by signing the Nicola watershed pilot memorandum of understanding (MOU) on March 23, 2018.

Photo: David Thompson

The New Normal

Water, water everywhere, then nowhere to be seen.

BY ROSIE SIMMS, LAURA BRANDES, AND OLIVER M. BRANDES

IT HAS BEEN a roller-coaster year of freshwater extremes in Canada, with droughts and floods of historic proportions taking hold in turns across the country. Severe summer heat and drought conditions hit the Prairies this summer, and earlier in the year widespread flooding swept across the East Coast.

Conditions in British Columbia (B.C.) were particularly unstable. Spring flooding left entire communities under water and forced thousands to evacuate their homes in towns, cities, and First Nations communities across the province. Mere weeks after communities dealt with flooding wreckage, the province flipped into summer drought, with more than 500 fires raging through dry forests. By mid-August, Eastern Vancouver Island was in Level 4 drought. Only 10 days later, the Northeast, Northwest, Stikine, Skeena-Nass, and all of Vancouver Island reached this code-red drought level. The Northwest remained in Level 4 drought into October—an unprecedented situation with troubling implications for salmon and watershed health.

The consequences of drought in B.C.—and across Canada—are wide-ranging.

Warm water temperatures put additional stress on salmon during their migration to spawn, fire-ravaged watersheds may not be reliable sources of clean drinking water, and the economic fallout from drought is also increasingly apparent. This summer, water shortages threatened operations at the Mount Milligan copper mine in central B.C. The Oil and Gas Commission required industry to suspend all previously approved water diversions in several waterways within B.C.'s Peace and Liard River watersheds. Hot and dry conditions resulted in rising costs and production issues for farmers across the country. And in Vancouver Island's Cowichan Lake area, volunteers from the Lake Cowichan First Nation, and local stewardship groups walked dry creek-beds rescuing stranded fish fry.

As climate change takes hold, unpredictable, and extreme conditions will be the new normal for Canada. We must ask then: How can we be better prepared to deal with the escalating freshwater challenges at our doorstep?

Legal tools to prepare for challenges

Canadian governments all levels—from

federal to local—must use their best available tools to protect fresh water and ensure ecosystems and communities are resilient in the face of increasing threats to water security.

In B.C., one important source of water sustainability and security tools is the *Water Sustainability Act* (WSA). While the Act provides a suite of different mechanisms to protect fresh water, most of these have yet to be deployed. As such, uncertainty persists around how the WSA's sustainability and planning features will be triggered and used, how local communities can be involved, and how implementation will be supported and resourced.

Recent research from the POLIS Water Sustainability Project, based at the University of Victoria's Centre for Global Studies, highlights the ways in which the WSA can be leveraged to address freshwater issues, and how communities and watershed entities can be involved. This includes, for example, protecting environmental flows in rivers and streams, and implementing region- or watershed-specific water sustainability plans.

Importantly, the provincial government

cannot do it alone. Active roles must exist for Indigenous nations (such as government-to-government forums), communities, watershed entities, and water users to craft the necessary mix of solutions to address specific regional water issues. Ultimately, the mix of mechanisms deployed will depend on the local context: the nature of the water/watershed problems, local history, economic development priorities, and the role of Indigenous laws and authority in their traditional territories.

Making history in Nicola Valley

Both Canada and the B.C. provincial government have made strong commitments to reconciliation as part of their mandates (including implementing the United Nations Declaration on the Rights of Indigenous Peoples and the Truth and Reconciliation Commission Calls to Action). Working in government-to-government forums with Indigenous nations on watershed sustainability and resilience is a critical aspect of reconciliation that is beginning to unfold in B.C. The Nicola watershed—which has experienced both spring flooding and extremely low summer flows in recent years—is a focal point of current government-to-government freshwater efforts in B.C.

On March 23, 2018, history was made when five Nicola First Nations and the Government of British Columbia co-signed a Nicola watershed pilot memorandum of understanding (MOU). This innovative project will promote the co-leadership of water resources by the Province and the Nicola First Nations with an overarching goal of sustainable management and improved health of the Nicola watershed.

The MOU sets out the parties' shared commitment to work together in partnership to address watershed issues, with agreement that watershed planning, decision-making, and management must be informed by Indigenous knowledge and best available science, and shaped by Indigenous laws and the WSA.

While the Nicola example is a promising step, more is needed. Many other watersheds are facing urgent

water issues, and without political leadership and resources for government staff, Indigenous nations, and local communities to be involved, further progress will be limited.

Moving forward

While B.C. is now equipped with a modern provincial water law, the same cannot be said about the situation federally. Most of Canada's federal laws and policies date back to the 1980s. Modernizing federal legislation, with a stronger and more coordinated federal role in freshwater management and governance, is a necessary step forward if we are to successfully meet the water challenges and realities of the 21st century.

Moving from today's status quo to a more robust and sustainable system will require significant effort, but the urgency is clear. Major droughts and floods are no longer surprise, once-in-a-decade events. These extremes will be a regular part of our collective future. Using the best tools available to help communities prepare for and adapt to this new reality must be a priority for Canada—from coast to coast to coast.

No one silver bullet solution exists, but rather a suite of approaches is needed: implementing drought and climate resiliency strategies that protect water for nature; better integration of water and land use; and embracing water conservation as an overarching objective, with adequate water pricing and monitoring. Overall, many sources of authority and expertise, as well as creativity and innovation—both Indigenous and non-Indigenous—will be needed to create a resilient and sustainable water future in this country. *wc*



Rosie Simms is a researcher and project manager with University of Victoria's POLIS Water Sustainability Project. Laura Brandes is the communications director at the POLIS Water Sustainability Project. Oliver M. Brandes is the associate director at the University of Victoria's Centre for Global Studies and serves as co-director of the POLIS Project on Ecological Governance.



Complex and Cost-Effective

New real-time energy management system for water distribution. BY SANJAY PATEL

WATER AND ENERGY are two critical, mutually-dependent resources; the production and distribution of which are major expenditures for government. Energy production (including thermoelectric cooling, hydropower, energy mineral extraction, and mining), fuel production (including fossil fuels, biofuels, and other non-conventional fuels), and emission controls all rely on large amounts of water.

Likewise, large amounts of energy are needed to extract, convey, treat, and deliver potable water, as well as treat and dispose of wastewater.

According to the International Water Institute, the water sector represents around three per cent of the world's energy demand, with variations among different countries and cities. The Institute's 2014 report, "Energy and Water: The Vital Link for a Sustainable Future" indicates that energy consumption by public drinking water and wastewater utilities, which are primarily owned and operated by local governments, can represent 30-40 per

cent of a municipality's energy bill. At drinking water plants, the largest energy use (about 80 per cent) is to operate motors for pumping.

Energy is the second-highest budget item for water utilities, after labour costs, so energy conservation and efficiency are issues of increasing importance. Opportunities for efficiency exist in several categories, according to the Congressional Research Service's 2017 report on the "Energy-Water Nexus." These categories include upgrading to more efficient equipment, improving energy management, and generating energy on-site to offset purchased electricity. However, barriers to improved energy efficiency by water and wastewater utilities exist, including capital costs and reluctance by utility officials to change practices or implement new technologies.

The complexity of a water network in major cities and smaller communities alike means there are a variety of ways a utility could distribute the water

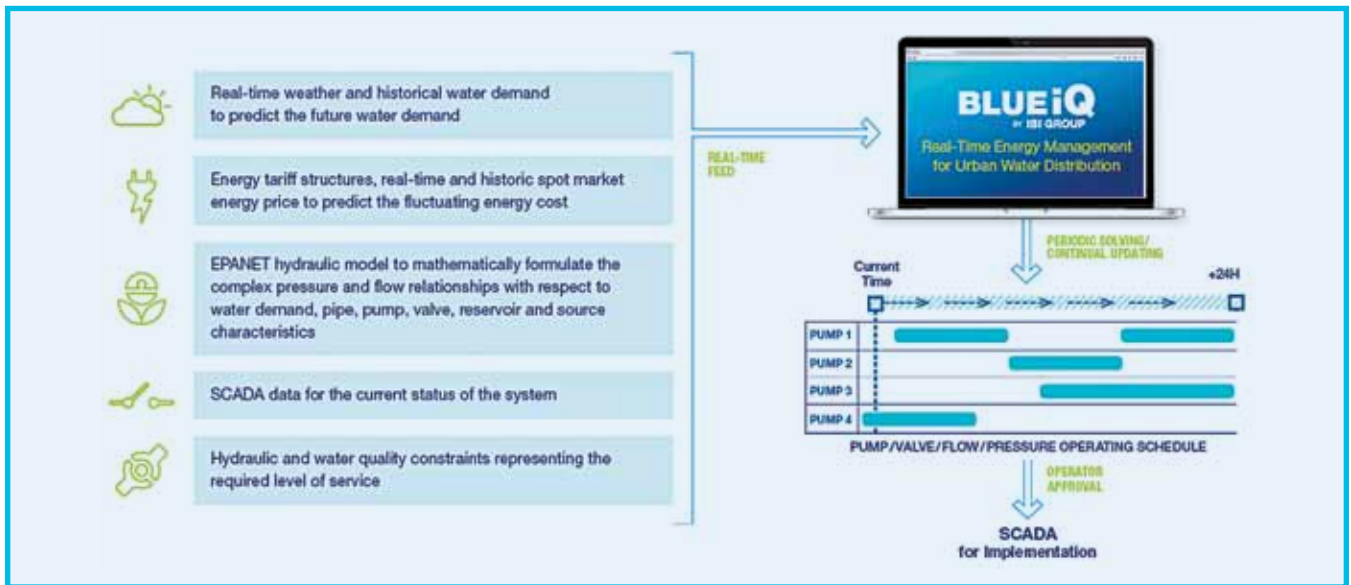
around the system. What is the most energy efficient and cost-effective pumping strategy to provide the required quantity of water and level of service to customers? This dilemma remains an ongoing challenge for water utilities across North America. To help solve this challenge, global technology and design firm IBI Group, developed BlueIQ, a real-time energy management solution for water distribution.

New water distribution tech

IBI Group's BlueIQ integrates with supervisory control and data acquisition (SCADA) to assist in identifying the optimal pump and valve schedule in real time to reduce overall operational costs. Using various real-time input data feeds, it's a system-wide, non-linear formulated solution optimizing quickly enough to be used immediately, while the hybrid automation aspect still gives the overseeing operator decision-making control.

With the utilization of existing water distribution assets, the BlueIQ software

Credit: IBI Group



provides predictive analytics and optimization of the following:

- Factoring in current weather and historical water patterns to predict future demand;
- Energy tariff and spot market energy pricing to predict fluctuating unit energy costs;
- The EPANET hydraulic model to mathematically formulate the complex pressure and flow relationships;
- SCADA data; and
- Hydraulic and water quality constraints.

The formulation allows for a rolling, forward-looking pump, and valve schedule to be optimized periodically and quickly enough for immediate use. A cost-effective operating strategy to provide customers the required level of service is maintained, despite unexpected variations and changing system conditions.

Blue IQ in the big smoke

The Toronto Water Transmission System covers the City of Toronto and southern portion of York Region. Serving a population of 3.4 million, it is the largest water system in Canada and one of the largest in North America. With water being treated at four filtration plants located on the north shore of Lake Ontario, and then transported to higher elevation pressure districts throughout the system through pumping stations, storage reservoirs, elevated tanks, and

approximately 500km of transmission mains, its interconnectivity is complex.

BlueIQ provides Toronto Water’s Pump Control Officers with optimal operational strategy, regenerated and updated in eight-hour intervals, which has resulted in an energy reduction of eight million kWh annually, and results in savings of \$1 million.

“This is a completely new technology package that provided a customized solution for Toronto. Combining all the real-time inputs, with an accurate calibrated hydraulic model, and generating a proven and effective advanced pump schedule has significantly reduced Toronto Water’s operating costs,” says Gary Thompson, area supervisor of process, operations and maintenance for Toronto Water.

Originally developed for the City of Toronto in 2015, IBI continues to fine-tune the software and look for added efficiencies. The firm is currently working on an artificial intelligence (AI) algorithm which will support the BlueIQ software to deepen the accuracy of its predictions, ultimately saving water utilities more money in energy costs, with an even greater reduction in greenhouse gas emissions. The intelligent solution contributes to the firm’s smart city offering, and supports its new strategic plan.

“BlueIQ is an exciting product which has been in development by our Intelligence team since 2012,” says Scott Stewart, IBI Group CEO. “As we continue

to work with cities and municipalities around the world to support the adoption of smarter and more efficient infrastructure, we see the launch of BlueIQ as an important next step in the firm’s technology-driven future.”

As cities and municipalities continue to identify “smarter” operational solutions—looking for ways to reduce overall energy consumption and contribute to a more sustainable future—predictive technologies with optimization will be sought-after tools. These technologies are capable of analyzing large amounts of data in near real-time, resulting in faster and more effective decision-making.

For water utilities, providing the required quantity and level of service is of utmost importance but there is often flexibility in how this can be delivered. BlueIQ allows utilities to make more informed decisions with more of the available data, allowing for a more sustainable and financially stable solution for water distribution assets. WC



Sanjay Patel is IBI Group project lead for water optimization solutions.



For further information, visit ibigroup.com/blueiq



The Horn Plateau contains the source waters of the Willowlake, Horn River, and Rabbitskin River. Traditional knowledge identifies the Horn Plateau as a place that could be relied upon during times of food scarcity in the Mackenzie Valley. Mills Lake and the lower Horn River areas are important harvesting areas for surrounding communities.

The Blue Basket

Canada's first indigenous protected area conserves valuable headwaters.

BY TODD WESTCOTT

AFTER YEARS OF CONSULTATIONS, the Dehcho First Nations and the Government of Canada announced the first Indigenous Protected Area (IPA) in Canada, the Edézhzhíe Protected Area on October 11, 2018.

The Dehcho First Nations Assembly designated the Edézhzhíe Protected Area to protect water, conserve biodiversity, and wildlife habitat, and to ensure that the Dehcho Dene relationship with the lands of Edézhzhíe is maintained for present and future generations through Dehcho-led stewardship, monitoring, and cultural activities.

Background

“Our people know Edézhzhíe as a special and spiritual place. By working together to secure permanent protection, we are taking steps with Canada to renew our nation-to-nation relationship and ensure that the lands, water, and Dehcho way of life are maintained in Edézhzhíe for present and future generations,” said Jonas Antoine, Elder of the Dehcho First Nations.

The Edézhzhíe Protected Area is located in the southwestern part of the Northwest Territories and covers 14,218 square kilometres, an area more than twice the size of Banff National Park. The Protected Area will be managed through a consensus-based management board and the stewardship activities of the Dehcho First Nations’ Indigenous guardians and stewardship programs.

Environmental groups, such as Ducks Unlimited Canada (DUC), Conservation Parks and Wilderness Society (CPAWS), and Nature Canada congratulated the Dehcho First Nations, the Government of

Canada, the Canadian Wildlife Service, the Government of the Northwest Territories, and the other partners that participated in the establishment of the area.

“DUC supports the creation of Indigenous Protected Areas and will continue sharing our conservation knowledge with Indigenous Peoples as part of their land-use planning,” said Jim Brennan, director of government affairs at DUC. “Ongoing collaborations like this are key to conservation progress in the North.”

Indeed, DUC was one of the collaborators. More than 15 years ago, DUC purchased a key, privately-held property with funds provided by a variety of sources, including the North American Wetlands Conservation Act and the United States Fish and Wildlife Service. The organization agreed to hold it until the Edézhzhíe lands would be formally and permanently protected, enabling DUC to then relinquish its ownership.

“DUC is proud to have played a role in helping the Dehcho people realize their conservation vision for the Edézhzhíe lands,” said Brennan.

Critical water conservation

The IPA will be funded in its first few years by the Canada Nature Fund, as provided for in Budget 2018, which set aside \$500 million in government money to seed a \$1 billion nature fund with the contribution of corporate, not-for-profit, provincial, territorial, and other partners.

Establishment of the Edézhzhíe Protected Area will serve Canada’s goal of protecting 17 per cent of land and fresh water by 2020.

The Government of the Northwest Territories Ministry of Environment and Natural Resources identifies the Horn Plateau as a prominent landform in Edézhzhíe containing the source waters of the Willowlake, Horn River, and Rabbitskin River. Traditional knowledge identifies the Horn Plateau as a place that could be relied upon during times of food scarcity in the Mackenzie Valley. Mills Lake and the lower Horn River areas are important harvesting areas for surrounding communities.

The Horn Plateau is a unique ecosystem. The headwater lakes and muskeg on the Plateau feed the Rabbitskin, Willowlake and Horn Rivers and Mills Lake, all of which are important fish and wildlife habitat, and sources of clean water.

The richness and diversity of Edézhzhíe have made this area a central cultural and spiritual gathering place for the Dehcho and Tłı̨chʼo peoples that figures prominently in Dene legends. As such, it became known as the “Basket.”

Edézhzhíe also hosts numerous cultural sites, trails, and harvesting areas, and has traditionally been used for hunting, fishing, trapping, and other activities. Mills Lake is a key northern wetland on the Central and Mississippi continental flyways for migratory birds.

Cooperative management of this newly protected area will ensure that these birds and all visitors will continue to enjoy this unique area for generations. **wc**

Todd Westcott is Water Canada’s content and marketing manager.

Contemplating Costs

Rising wastewater prices and aging infrastructure drive water rate hikes in North America. BY GLOBAL WATER LEADERS GROUP

IT'S TOUGH TO KEEP TRACK of the rising rates related to wastewater processing. The Global Water Intelligence (GWI) manages this through its comprehensive Global Water Tariff Survey, a leading repository of water price data and analysis of water and wastewater profiles from more than 510 locations worldwide.

North American highlights

The results of GWI's 2018 Global Water Tariff Survey reveal that the average water and wastewater bill in North America increased by 3.6 per cent between July 2017 and July 2018, resulting in an average combined price of US\$4.22/ m³ for the region. The survey results, drawing from data collected by GWI from 77 cities across North

America, suggest that rising wastewater operating costs, network upgrades, and falling water consumption are key drivers behind the rate hikes seen this year.

According to a new white paper released by GWI, based on the results of the survey, the rate hikes reflect a widespread need across the region to replace aged infrastructure and fund sewerage network upgrades, amid growing concerns over extreme weather events and pollution.

Canada and First Nations focus

At \$3.61/m³, the average water and wastewater tariff in Canada is below the regional average, reflecting the fact that water utilities in Canada are much more reliant on federal and provincial grants for capital expenditure than the US.

While grants represent a particularly important source of water infrastructure finance for First Nations communities, the historical growth in the number of long-term drinking water advisories has made it difficult to justify rate increases for Indigenous populations.

As the Canadian government works toward eliminating all long-term drinking water advisories by March 2021, the willingness to pay appropriate rates in order to maintain the upgraded infrastructure is likely to make it easier to justify rate increases. WC

For further information, visit globalwaterintel.com/global-water-tariff-survey

LANDS TO GREAT LAKES
Relationship Status: It's Complicated

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AWARDED



Conor Tapp, Green Calgary's executive director (middle), is presented the CIPH National Water Wise Award by Matt Wiesenfeld, CIPH Program Manager (left), and Ralph Suppa, CIPH President and General Manager (right).

Green Calgary, a charity providing environmental education, products, services and hands-on support, has been awarded a national Water Wise Award from the Canadian Institute of Plumbing and Heating (CIPH).

CIPH Chairman **Allen Taylor** lauded Green Calgary for its leadership in encouraging and inspiring others to

champion environmental leadership in their homes, workplaces, schools and communities. Specifically, CIPH selected Green Calgary for its Green Homes and Community program designed to help people incorporate simple and affordable green options into the way they live, work and play. Not to be overlooked, CIPH lauds Green Calgary's annual community rain barrel sales initiative, a program that has saved over a billion litres of water.

"Every community in Canada should be fortunate enough to have an organization like Green Calgary working on its behalf," said Taylor. "Beyond its commitment to water conservation, we were duly impressed by Green Calgary's efforts to bring environmental education and programming into schools."

The CIPH award program was developed to recognize outstanding efforts to improve relationships with water. Founded in Montreal in 1933, the CIPH is a not-for-profit trade association made up of more than 260 companies member companies. For further information, visit ciph.com

APPOINTED



BRIAN FRANCIS

Brian Francis, Chief of Abegweit First Nation in Prince Edward Island, has been appointed to the Senate of Canada.

Prime Minister **Justin Trudeau** announced the appointment on October 11, 2018. "We congratulate Senator Francis on this appointment. He has an outstanding record of achievement. He will make great contributions to the Senate of Canada which will create a better country for all," said Assembly of First Nations Chief **Perry Bellegarde**. "We need more First Nations people around all decision-making tables." Francis is the second Mi'kmaq Senator to be appointed to the Senate of Canada.

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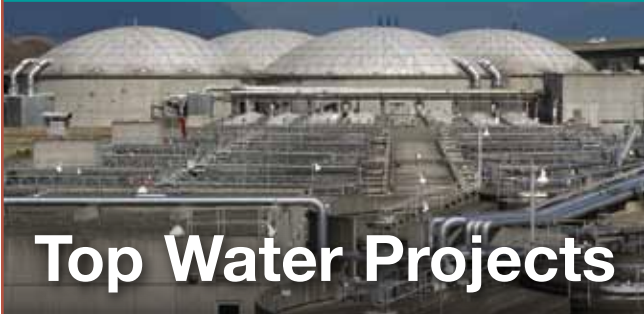

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Remembering Hans Peterson

Pioneering scientist in safe drinking water responsible for cleaning contaminated water on reserves.

Dr. **Hans Peterson** is being remembered as a pioneer in safe drinking water for changing thousands of lives. He died of a heart attack on October 24, 2018 at the age of 68. Colleagues, family, and friends say he was a passionate, determined, and hard-working scientist, inventor, researcher, educator, and advocate.

Peterson helped found the Safe Drinking Water Foundation (SDWF) in 1998 to educate students across Canada and to lobby municipal, provincial, and federal governments to improve water regulations. He also pioneered the development of the Integrated Biological and Reverse Osmosis Membrane (IBROM) water treatment process. IBROM was developed at Yellow Quill First Nation from 2002 to 2004; at

the time Yellow Quill's groundwater was considered untreatable. The invention helped end boil water advisories for 21 First Nations.

According to **Brian Trainberg**, president of the Safe Drinking Water Team and the lead operator of the Whitecap Dakota First Nation Treatment Plants, IBROM was groundbreaking technology.

"It was much more efficient than the standard water treatment in Canada," Trainberg told Leisha Grebinski on CBC Radio. "We actually used the naturally born biology of the water to remove the impurities in the water. And [Peterson] dreamt this thing up living out of a little 40-foot trailer in Yellow Quill, Saskatchewan."

Former Water Canada editor **Kerry**

Freek recalls regularly speaking with Peterson for updates on the foundation and his work with Yellow Quill First Nation. She and her colleague, **Lee Scarlett** (then Water Canada's associate publisher), worked with Peterson and his small team to bring further profile to the foundation through the magazine. "Hans was passionate about helping communities achieve safe drinking water. His focus and enthusiasm were undeniable," she says.

Nicole Hancock, executive director of the SDWF, says Peterson was passionate about making sure everyone had safe drinking water. She estimates that there's more than 100,000 people who have safe drinking water because of Peterson's invention. Incredibly, even after he retired, he was known for working 18-hour days trying to push water issues forward.

The SDWF focuses on informing the next generation about water issues and sending approximately 700 water testing kits to schools across Canada every school year. WC



1 Party time at the Grande Water Management Systems and TetraTech-sponsored evening celebration featuring Quebec's renowned Painchaud Family. L-R: Robert Haller, Canadian Water and Wastewater Association; Joan Hawley, Water Environment Federation; William Fernandes, City of Toronto; Michele Grenier, Ontario Water Works Association; and, Sangeeta Chopra Chartier, Ontario Clean Water Agency. 2 John Presta, Region of Durham asks a question after one of the over 120 presentations that were delivered across multiple tracks and sessions. 3 David Martin, Federation of Canadian Municipalities Green Municipal Fund, shares a laugh with Water Canada's Todd Latham during the closing remarks.

CWWA – National Water and Wastewater Conference Montreal, Que.

Merging all aspects of water management, from wastewater to drinking water to water and wastewater research to utility and infrastructure challenges, the Canadian Water and Wastewater Association's annual National Waste and Wastewater Conference fosters national dialogue on the most important national water issues facing municipalities and utilities today. This year, more than 450 delegates convened at the Hotel Bonaventure from November 4 to 7 to partake in parallel sessions, expert panels and engaging keynote presentations – like the one from **Stephen Szucs**, founder of Sustainable

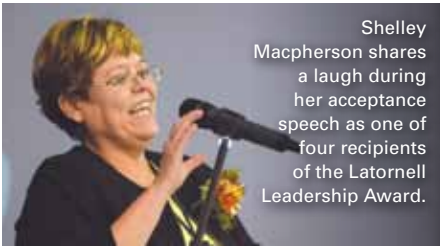
Joes. The quality content along with an animated exhibit and networking area spiced with an amazing social agenda made this one of the best events of the year.

Water Canada was proud to sponsor the event and moderate a panel discussion on "Communicating Water to the Public" that featured: **Adam Krantz**, chief executive officer of the National Association of Clean Water Agencies; **Liana Kreamer**, communications manager of the Canadian Water Network; **Evan Pilkington**, managing director of BlueW.org; and, **Pierre Béland**, author and board member of AquaHacking and

de Gaspé Beaubien Foundation.

If you missed it, you also missed the singing debut of CWWA Executive Director **Robert Haller**. He hadn't planned on singing; his opening presentation with entrance music was supposed to play with the lyrics up on the screen. Of course, that's when the audiovisual equipment crashed. But no technical glitch can slow down true water professionals, so that entertaining opening was the setup for a fun and enthusiastic three days of water learning and networking. See you next time in Banff on November 3 to 6, 2019.

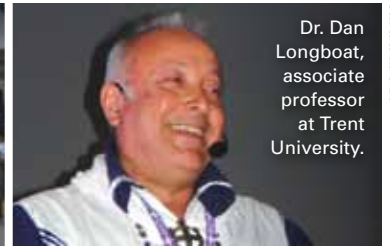
Photo: Water Canada



Shelley Macpherson shares a laugh during her acceptance speech as one of four recipients of the Latornell Leadership Award.



More than 650 delegates took in over 80 speeches, discussions, and tours over the three-day symposium.



Dr. Dan Longboat, associate professor at Trent University.

Photo: Water Canada

Latornell Conservation Symposium Alliston, Ont.

The 25th annual Latornell Conservation Symposium welcomed more than 650 delegates, speakers, and exhibitors to the Nottawasaga Inn Resort and Conference Centre in Alliston, approximately 85 kilometres north of Toronto.

Attendees gathered for three days of discussions, tours, and presentations that focused on the theme of Lands to Great Lakes – Relationship Status: It’s Complicated. That meant an in-depth look at the lands that connect the Great Lakes and St. Lawrence River, and the activities that are underway to conserve, enhance, and protect them.

The symposium was both opened and closed by individuals from the Indigenous community, recognized

as a vital voice in understanding the relationship of land and water and how best to care for both. The opening remarks were provided by Dr. **Dan Longboat**, as associate professor at Trent University and founding director of the Indigenous Environmental Studies and Sciences Program, the only accredited university level program of its kind in North America. Dr. **Robin Kimmerer**, a professor of environmental and forest biology at the State University of New York College, provided the closing remarks.

Both sets of remarks were instrumental in furthering the conversation throughout the three days of activities, as the centuries-old traditional ecological

knowledge held within First Nations communities is invaluable in mending the complicated relationship explored during the symposium.

The symposium also presented the Latornell Leadership Awards to four individuals who have made incredible contributions to water stewardships within the Great Lakes watersheds over the past 50 years: retired chair of the Sudbury Source Protection Committee **Nels Conroy**; **Shelley Macpherson** of the Regulations Enforcement Office of the Rideau Valley Conservation Authority; retired Toronto Region Conservation Authority CEO **Brian Denney**; and Quinte Conservation general manager **Terry Murphy**.

For further information, visit latornell.ca.

Photo: Brian Shumway/Innovation Week



The five finalist teams at the 2018 AquaHacking Challenge Finals during Ontario Water Innovation Week.

Ontario Innovation Week Toronto, Ont.

More than 1,000 attendees dove into Ontario Innovation Week (OnWIN) on October 22-26, 2018. The event, hosted by WaterTAP (Technology Acceleration Project) in Toronto, featured more than 100 speakers and several workshops. Participants came together to discuss current issues, celebrate progress, share ideas, and plan for the future of the water sector.

In addition, five teams of young innovators pitched their clean-tech solutions for the AquaHacking 2018 Lake Ontario Challenge for a chance at \$50,000 in prizes and a spot at local

incubators. Team E-Nundation claimed the first place, making a splash with their solution which produces maps of potential flooded areas and floodwater depth based on discharge forecasts from Environment Canada to better predict and adapt to flooding.

“It’s been an incredible journey for us, with opportunities to learn from, grow and connect with experts from tech, environment, business, academia and government,” said **Karem Chokmani** of team E-Nundation. “We are thrilled by the positive response from the Jury and excited to continue working on our multi-

platform application designed to tackle the challenge of flooding prediction and adaptation.

AquaHacking, now in its fourth year, is a technology challenge designed to engage the next generation of water tech pioneers to tackle critical fresh water issues. With over 60 engineering and tech solutions developed and 15 solutions on the market or in development, AquaHacking has proven its capability to bring together key stakeholders and innovate for impact. The AquaHacking Challenge is sponsored by the de Gaspé Beaubien Foundation, IBM Canada, the RBC Foundation, GHD, Keurig, Ovivo, Sanexen, Ontario Power Generation, and others.

“What makes AquaHacking special to me is the fact that the issues these young innovators are solving are championed by leaders from across the water sector, including eNGOs, municipalities and water organizations and are designed for impact,” said **Bernadette Conant**, AquaHacking 2018 Jury Member and CEO of Canadian Water Network.

For further information, visit waterinnovationweek.com



Ontario Environmental Commissioner Dianne Saxe provides the opening address on environmental injustice regarding pollution and Indigenous communities.



Student participants were represented in the 1,097 registered attendees, many of which attended the Student Awards Ceremony.

Water Quality Tech Conference Toronto, Ont.

The Water Quality Technology Conference & Exhibition, hosted by the American Water Works Association (AWWA), was held in Toronto on November 11 to 15, 2018. More than 1,000 attended this established and highly regarded conference that provides a practical forum for a wide range of water technology professionals to exchange the latest research and information.

The opening session keynote was delivered by Environmental Commissioner of Ontario, Dr. **Dianne Saxe**, a frequent contributor to Water

Canada magazine. The Commissioner's address, *Environmental Injustice: Pollution and Indigenous Communities*, provided a well-informed and valuable overview of the water quality issues from her most recent environmental protection reports. She focussed on pollution and Indigenous communities, as well as water pollution, drinking water, and the water-related opportunities to mitigate and adapt, to climate change.

The event provided several professional learning opportunities, including technical sessions, workshops,

and facility tours. The extensive technical program included the following topics: microbes and Algae; distribution issues, water quality and modeling; water resources: sources, protection and emerging issues; disinfection practices; treatment technologies; controlling contaminants; data driven decisions: methods, sensors and monitoring; and, perfluorinated compounds. The 2019 call for abstracts is already open.

For further information, visit awwa.org/conferences-education/conferences/water-quality-technology.aspx

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Guardians of the Downstream

Team work to protect one of Canada's longest wild rivers.

BY CORRINE PORTER AND HEATHER CROCHETIERE

DOWNSTREAM is that place where important nutrients tend to congregate, where essential new habitats are carved from rugged banks over time. Floating downstream conjures up peaceful, lazy, and relaxing travel on the river. But in Canada's northern and remote regions, downstream is becoming a worrying notion. When we witness frightening and unhealthy changes in local rivers or lakes, we can't help but wonder: What's going on upstream?

In northern British Columbia, Kaska residents of the communities of the Dease River First Nation and the Daylu Dena Council are expressing concerns and asking that exact question.

The mighty Tāgh'agah' Tuēh, or Liard River, is one of Canada's longest wild rivers. Free flowing from its headwaters in Yukon, it winds through northern British Columbia all the way to its mouth at the Mackenzie River in the Northwest Territories. Its magnificent watershed is home to Indigenous communities as well as grizzly bears, bull trout, moose, and woodland boreal caribou.

Providing home and nourishment for wildlife and communities alike, Canada's wild rivers are among the last bastions of wildness increasingly recognized as nothing less than a global treasure. And yet, even though communities continue to notice worrisome changes, we don't have sufficient information or monitoring capacities to understand the health of these rivers and how upstream

activities are affecting them.

In the Liard watershed, concern is growing with observations of very low water levels, low precipitation, and later freeze ups, as well as increased jet boating and poor waste management associated with growing recreational use of the area. Resource development is also a concern, with proposed upstream mine tailings ponds posing a threat to community supplies of safe, clean drinking water.

To better understand what is happening to the Liard, and to be the eyes and ears on the ground to protect Kaska lands and waters, the Dena Kayeh Institute (DKI), on behalf of the Kaska Nation, is continuing to build its Indigenous Guardians program which includes responsibilities for freshwater monitoring. Indigenous Guardians are the natural stewards of traditional lands. Not only can they see changes and react in real time, but they embody in their profession a central cultural and spiritual responsibility of their Nations, namely to protect and conserve the long-term health of their homelands and the lands, waters and wildlife on which their communities depend.

Because sharing and comparing data up- and downstream is so important in determining the health of the river, DKI has trained in Environment and Climate Change Canada's CABIN (Canadian Aquatic Biomonitoring Network) monitoring protocol by Living Lakes Canada with support from World

Wildlife Fund (WWF), adding important skills to the mix of traditional knowledge and modern science the Guardians are already applying in their work.

Gathering baseline data on key areas of the Liard is an important first step to understanding the health of the watershed. But getting to the next step—discovering how upstream projects are affecting local communities and wildlife long-term—will require the repetition of these monitoring efforts up and down this and other rivers over time. Building community capacity in this way requires funding and resources. Recent support and promised Indigenous partnerships from the federal government are encouraging, but investment in long-term monitoring programs is essential to meet shared environmental goals and responsibilities.

In the meantime, the Dane Nan Yé Dāh Guardians are optimistic about the health of the Liard. While the community will have to wait for the results of this fall's monitoring to be sure, pollution sensitive caddisflies were abundant in water samples taken over the summer. This is very good news to share with communities and indeed, the rest of the country. **wc**

Corinne Porter works with the Kaska communities on the development and implementation of the Dane Nan Yé Dāh program in B.C. Heather Crochetiere is a freshwater specialist with WWF-Canada and she leads the Wild Rivers program.

An aerial photograph of a wide river valley with green fields and brownish hillsides under a blue sky with scattered clouds. A large white circle is superimposed over the upper half of the image, containing the main headline text in red.

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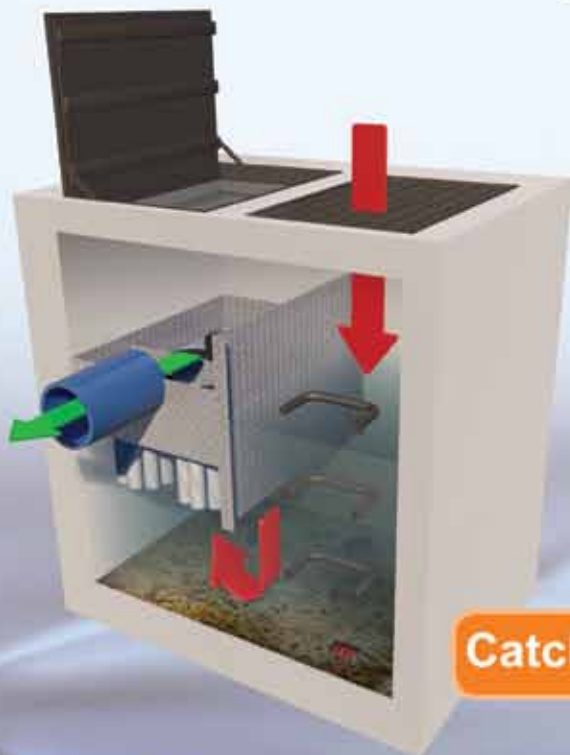
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