FALL 2019

GO with THE FLOW

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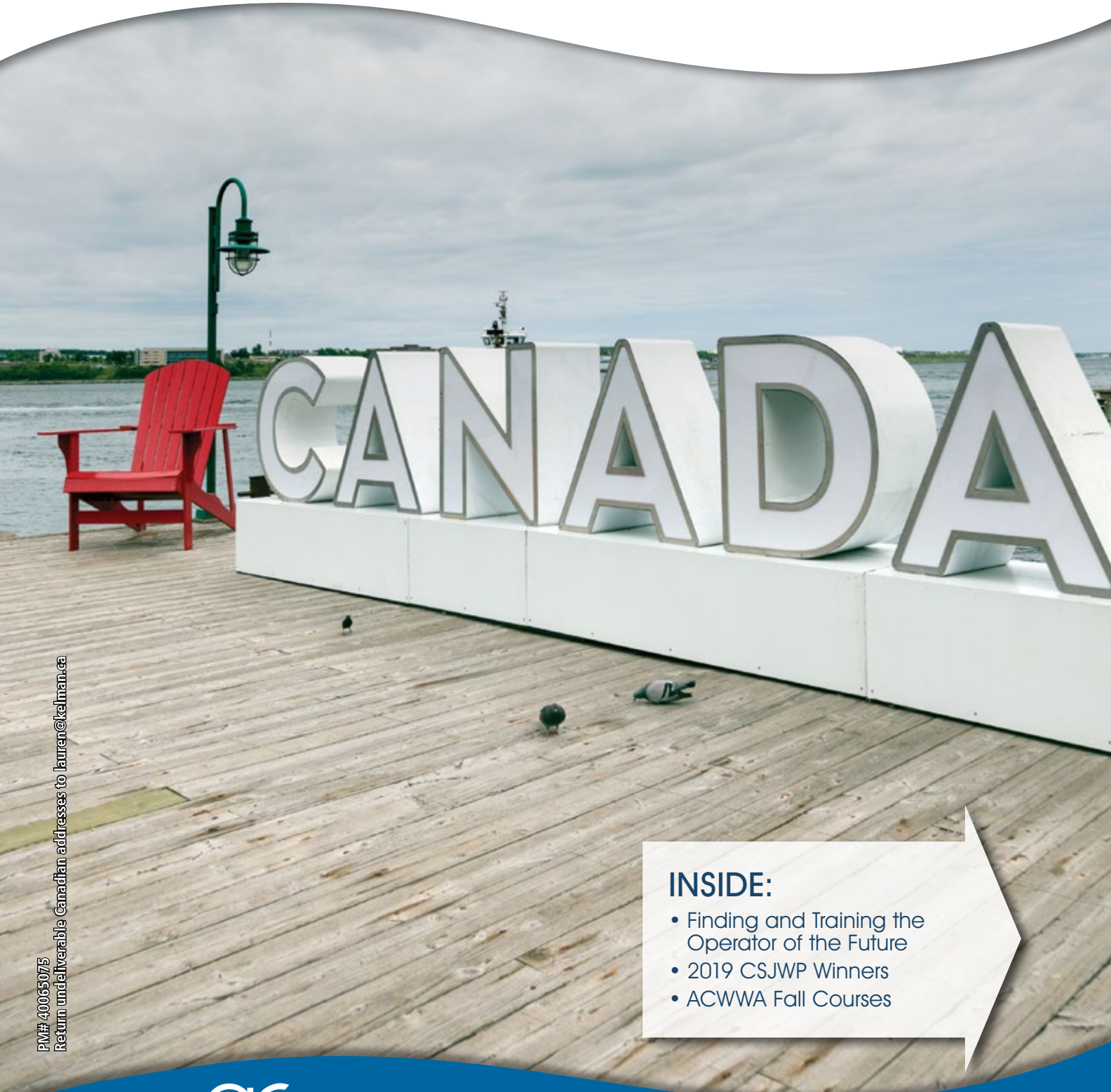

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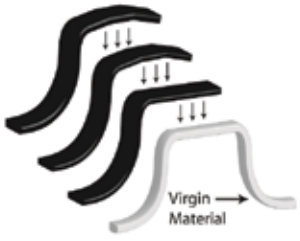

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American Water Works Association Atlantic Canada Section | Water Environment Federation® the water quality people®

Atlantic Canada Water & Wastewater Association
Box 28141, Dartmouth, NS B2W 6E2
Phone: 902.434.6002 Fax: 902.435.7796
contact@acwwa.ca www.acwwa.ca

Section Office
ACWWA Executive Director
Clara Shea contact@acwwa.ca
902.434.6002 F: 902.435.7796

Board
Chair
Jennie Rand, PhD, P.Eng.
jennie.rand@acadiau.ca
902.585.1519 F: 902.585.1067

Past Chair
Amy Winchester, M.A.Sc., P.Eng.
amyw@cbcl.ca
506.633.6650 F: 506.633.6659

First Vice-Chair
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brent.mcgovern@saintjohn.ca
506.658.4455

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Catherine Cameron
scotiatech.main@ns.sympatico.ca
902.468.2777

Secretary-Treasurer
Rob Gillis, P.Eng.
robg@halifaxwater.ca
902.497.1740

WEF Delegate (2017–2020)
Dave Galbraith
dave.galbraith@sansom.ca
902.895.0252 F: 902.893.7584

AWWA Director (2017–2020)
Graham Gagnon, Ph.D., P.Eng.
graham.gagnon@dal.ca
902.494.3268 F: 902.494.3108

Craig Kelman & Associates
www.kelmanonline.com
Tel: 866-985-9780
Fax: 866-985-9799

Managing Editor — Monique Doyle
Design/layout — Kristy Unrau
Marketing Manager — Darrell Harris
Advertising Co-ordinator — Jenna Matthes

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FEATURES

DEPARTMENTS

Magazine Chair:
Julie DiCicco
506.633.5000
Ext. 5402
jdicicco@dillon.ca

On the cover: The harbor in Halifax, location of the 2019 ACWWA Annual Conference coming up in October. | dreamstime.com

Jennie Rand (Acadia University)

Highlights of this year

Hello everyone and I hope you are having a wonderful start to the fall season! It is hard to believe I am writing my final message for *Go With the Flow* as Chair of the ACWWA. It's been a wonderful experience and I am thrilled with all the activity the Association has been busy with over the past year. I'd like to highlight a few things to acknowledge those people who put extra effort into their roles.

The ACWWA partnered with the governments of Prince Edward Island, New Brunswick, Nova Scotia, and Newfoundland and Labrador, as well as the City of Charlottetown and Halifax Water to apply for funding through Natural Resources Canada's Building Regional Adaptation Capacity and Expertise (BRACE) Program for a project valued at $645,000 entitled *Incorporating Climate Resilience for Municipal Infrastructure into the Updates of Existing Atlantic Canada Water and Wastewater Design Guidelines*. These updates will ensure that climate change implications become a key consideration that is vital to the long-term success and sustainability of water and wastewater projects.

The ACWWA also received funding from the Water Environment Federation and the provinces of PEI, Nova Scotia, and Newfoundland and Labrador to create new education manuals that are specific to the Atlantic Canadian region for our core operator certification courses. We are excited to see them introduced in 2020.

We've been hard at work on research and creating a survey to evaluate the Atlantic Canadian water and wastewater industry for Inclusion, Diversity and Equity – this survey will be launched through email in October, and we encourage you to fill it out and distribute to colleagues to do the same. Thank you to WISEatlantic, the A.D. Foulis Chair at Acadia University, and to the ACWWA for supporting this important initiative.

The ACWWA also launched a new website that is easier to navigate and much more pleasing to look at! If you haven't visited yet, check it out at *www.acwwa.ca*.

Finally, the planning committees for the conference last year in Sydney, and this year in Halifax, have done a wonderful job in providing an exceptional experience to attendees. I encourage you to fully engage in the 2019 Annual Conference, coming up on October 6, and take in all it has to offer – a treasured keynote speaker, sold-out tradeshow, YP seminar, and substantial technical sessions are just a few things to look forward to.

A reminder that the ACWWA offers several training opportunities and there are multiple courses still scheduled for 2019 in all provinces. To see what's available, you can visit this webpage: *www.acwwa.ca/education/acwwa-courses*. You can also find archived webinars on the website and learn at your own pace! If there are any educational needs that aren't currently being met, please let us know and we will be happy to work with you to find a solution (*contact@acwwa.ca*).

I would like to thank all the ACWWA volunteers, Committee members and Chairs, Board members, AWWA and WEF staff, and especially our Executive Director, Clara Shea, for making the ACWWA such a wonderful association – if you haven't gotten involved yet, I highly recommend it!

Thanks, and see you at the conference in Halifax in October!

"A reminder that the ACWWA offers several training opportunities and there are multiple courses still scheduled for 2019 in all provinces."

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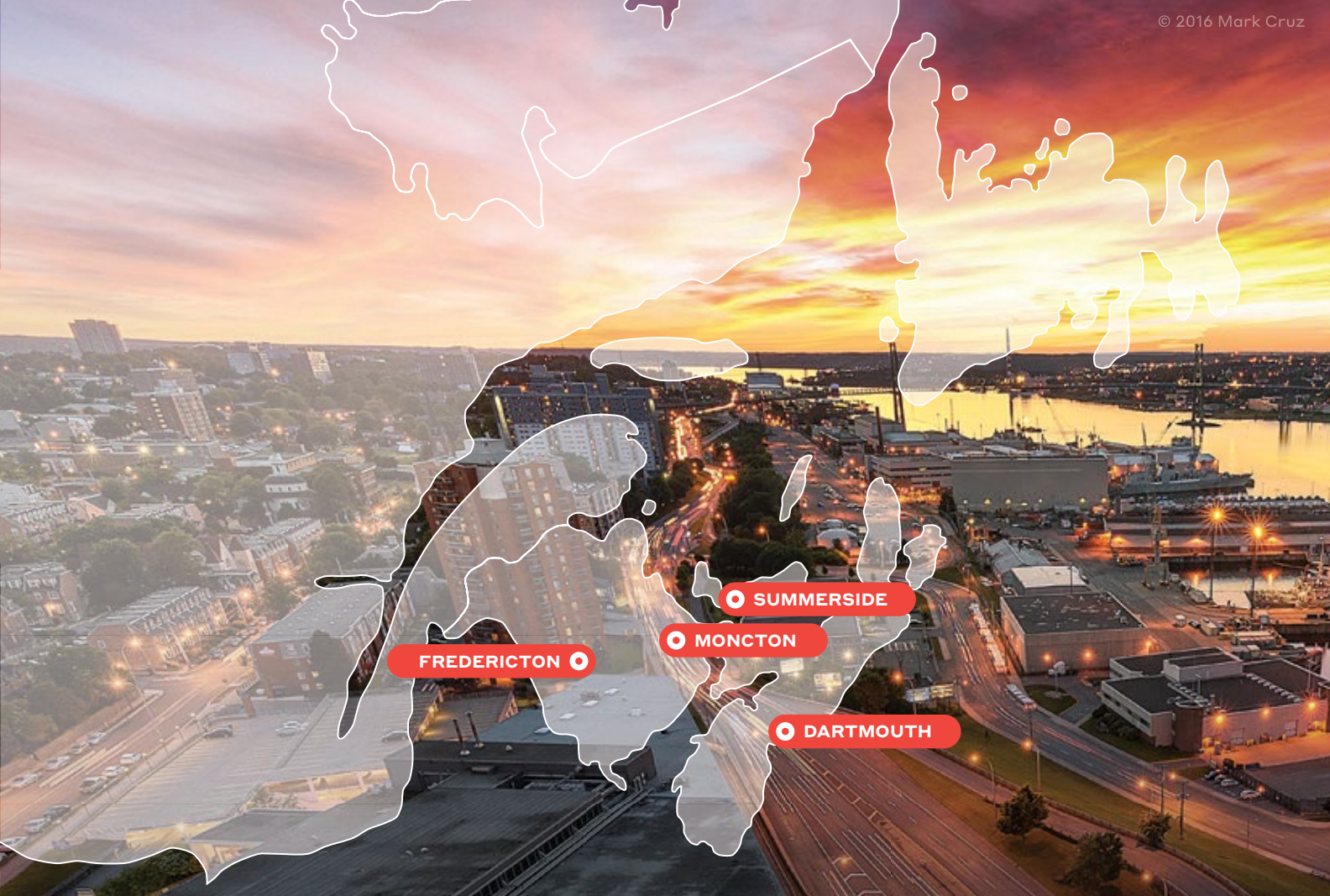

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Graham Gagnon, Ph.D., P.Eng. (Dalhousie University)

Events for members

I hope that everyone is enjoying summer in Atlantic Canada! For several years our members have contributed to the ACWWA Photo Contest – out of which we receive an amazing calendar that shows pictures of our members enjoying their water experiences. I am often struck by how many photos our members share of their friends, families, and pets enjoying the beautiful water systems in Atlantic Canada. We are truly blessed by our natural environment and the range of water professionals that aim to keep our ecosystems healthy and safe for these water experiences.

> "One topic that will undoubtedly be discussed is member satisfaction – as a section and association we aim to continually enhance the value experience for members."

As we look toward fall, our members should begin to get excited about two opportunities for professional engagement. First, the Regional Meeting of Section Officers (or RMSO) meeting will be held in Halifax, NS (September 6–7). While this meeting will engage our section leadership, there is a lot of opportunity to members to participate at social events and meet other section leaders from New England, New Jersey, Quebec and beyond. We will discuss best practices across sections and emerging topics in the water industry. One topic that will undoubtedly be discussed is member satisfaction – as a section and association we aim to continually enhance the value experience for members. So please share your ideas to our section leadership – in fact the ACWWA calendar represents a suggestion we received from an ACWWA member!

Another important event for our section is the ACWWA annual conference – which is happening October 6–8 in Halifax, Nova Scotia. It will be an amazing event that appears to have a strong technical program and will have a social program that will offer a lot for everyone to enjoy. On the technical side of things, I am very excited to see that there will be presentation from Stella Bowes, a young professional who has led change in wastewater management in the South Shore of Nova Scotia, and as well Judy MacDonald, a familiar regulatory face to Atlantic Canadians, who will provide an update on Health Canada drinking water guidelines.

So enjoy the remaining parts of summer – take plenty of photos – and we look forward to seeing you this fall at many water events.

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Dave Galbraith (Sansom Equipment Ltd.)

Putting Atlantic Canada on the map

As I sit here in the August 32+ degrees heat wave writing this, I am thinking about attending WEFTEC in Chicago September 22–25. You might be reading this just as it is getting started. Hopefully you attended the Canadian Ice Breaker event on the 22nd and enjoyed the WEFTEC Technical Sessions and Trade Show. Perhaps I will see you there… We will be very fortunate to have Tom Kunetz, WEF *(about to be Past)* President at our ACWWA Annual Conference in Halifax. I am looking forward to showing Tom around one our great Atlantic Canada cities and introducing him to as many people as possible. Tom is a really great guy and he thinks outside the box. He is very funny too… he was trained at Second City in Chicago. Once you meet him, you will not forget him.

As always, I am doing my part as your WEF Delegate to put Atlantic Canada on the map. I have been very actively involved in the WEF Diversity & Inclusion Working Group. As a result of our committee's work and recommendations to the WEF House of Delegates, WEF has created a special Task Group to look into and help rewrite WEF's Corporate Diversity & Inclusion Statement. I have volunteered to work with this Task Group. I will provide updates at a later date if in fact I am selected to be part of the team.

Pictured above are members of the WEF Board of Trustees; WEF Staff; CWWA; IWA; several WEAO board members and the CAC with representatives from across Canada. "Canadian themed" socks as well as CWWA "Canadian toques" were presented after the meeting.

Toronto, Canada
WEF 2018/19 "Board of Trustees" makes history by holding the first Board meeting outside the USA

The WEF Canadian Affairs Council (CAC) as well as the CWWA and International Water Association (IWA) 2020 World Water Congress & Exhibition Committee were invited back in March to meet with the entire WEF Board of Trustees on July 11–12, 2019 in Toronto.

During a casual dinner event on Thursday, we had a great networking opportunity to meet many of the key people at WEF (volunteers and staff). I had great one-on-one discussions with several of the WEF Board members and WEF staff. Jackie Jarrell, WEF President Elect, spoke very highly of the ACWWA and our Annual Conference held in Cape Breton last year. Tom Kunetz, WEF President, is really looking forward to coming to the conference this fall in Halifax. Hopefully you will have the chance to meet him while he is in town.

At the formal Board Meeting on Friday morning, the IWA Committee and the CWWA made their presentation with facilitated discussion about the World Water Congress & Exhibition 2020 being hosted in Toronto. This is a must-attend event. The CAC presentation followed.

As the Chair of the WEF Canadian Affairs Council, I was responsible to gather information from each WEF MA (Member Association) across the country and prepare the PPT to present to the WEF Board of Trustees. We explained what the CAC was and how we operated. We outlined cultural sensitivities/differences between the USA and Canada and provided examples of opportunities for collaboration. We provided Canadian perspectives and introduced important issues such as diversity and inclusion; translating WEF materials into French; developing WEF materials that have Canadian content; supporting Canadian Specialty Conferences (Stormwater; Residuals & Biosolids); workforce development; the Canadian Stockholm Junior Water Prize; and several other topics.

My presentation was well received and a great open dialogue resulted. We have a commitment that WEF will be addressing several key issues and that Canadians will have a stronger voice at future WEF events. As a result, I was invited by WEF President Elect Jackie Jarrell to be involved in with a working group she is creating. More details will follow.

Please reach out to me if you have any questions about WEF and I will help you find the answers. Hope you all had a great summer!

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By Katherine Saltzman

Finding and Training the Operator of the Future

Obstacles and paths to water operator careers

Amid retirement surges across the water workforce, there are ongoing discussions about the urgency to recruit, train, and retain new professionals. Part of this effort involves establishing the water sector as an attractive career path that supports essential infrastructure and protects public health and the natural environment.

However, the water sector faces additional challenges that most sectors do not. Training requirements and certification expectations vary among states and, naturally, among utilities that differ in size, revenue, and process capacity. But the challenges go deeper. They include limited access to updated, peer-reviewed training materials; inadequate time and money for operators to study or maintain continuing education requirements; and the challenges of keeping pace with rapid technological changes. These challenges are in addition to equipping employees with the complex science, technology, engineering, and mathematics components necessary to be a water operator.

However, solutions are emerging to overcome these challenges and secure the workforce of the future. Organizations, states, and utilities are finding ways to attract and train the essential employees who will protect our infrastructure, environment, and public health.

Water sector uniqueness

As highlighted in the 2018 Brookings Institution report *Renewing the Water Workforce: Improving Water Infrastructure and Creating a Pipeline to Opportunity*, many of the water sector's concerns about its workforce reflect similar social, labor, and economic concerns across all U.S. sectors. These concerns include high retirement rates, limited pools of qualified replacements, and fear of technical knowledge loss. The report calls these concerns "emblematic of bigger economic trends and broader policy issues facing the country, including the continued need to support a new generation of workers amid mounting retirements, changing technologies, and other labor market shifts."

But where the water sector stands apart is its need for greater upfront preparation in terms of extensive training, skills, and knowledge competency. The Brookings report states a U.S. Bureau of Labor Statistics finding that water sector jobs have a higher threshold for entry.

More than 78% of water workers need at least one year of related experience and 16% of water workers need four or more years' experience prior to joining the water workforce. Moreover, about 44.7% of water workers need at least one year of on-the job training to qualify for their positions. Compare this to the national average of 5.6% of jobs across all occupations that need more than one year of on-the-job training, according to the data.

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In addition to on-the-job training, water workers are required to operate various technologies and tools as part of their daily responsibilities. These requirements add additional complexity to operator jobs and training. According to the Brookings report, "Water workers embody the definition of skilled trades. On average, water workers use 63 different tools and technologies each, compared to the six tools and technologies typically used by workers in all occupations nationally."

Entering the water workforce

Even though most sector newcomers lack operational experience, each still is required to pass a Level 1 certification exam and possess hands-on experience as prerequisites for employment. With these considerations, utilities typically hire entry-level employees without a license and provide a certain amount of time for the employee to study for and pass a certification examination. Those who pass are then promoted to a full-time, certified operator position. This pre-certification period ranges from 30 days in some states up to one year in others.

"We have a chicken and egg system here: you can't get hands-on experience unless you have a license, but you can't get a license without hands-on experience," said Sidney Innerebner, principal and owner of Indigo Water Group LLC, a wastewater consulting and operator training company. Innerebner also is authoring WEF's new Wastewater Treatment Fundamentals series.

Supporting continual operator training

Once hired, operators are expected to continue studying for higher certifications and collect continuing education units (CEU). Larger utilities may have an in-house trainer who develops a CEU curriculum related to facility processes or equipment. This trainer works with the entire operations staff to help prepare them for certification exams. However, midsize and small facilities, which make up most treatment systems in the U.S., typically don't have the resources to support in-house training; therefore, operators self-study and use external trainers or online courses to prepare for examinations.

Despite the options available, there is concern among operators and trainers that the Need-to-Know (NTK) Criteria, which is tested for in certification exams and incorporated into curriculums for CEUs, may not always apply to the processes at an operator's facility or be relevant to their daily responsibilities, Innerebner said. NTK criteria is extensive but lacks detail on which topics are necessary for exam preparation or responsibilities in the field, making it difficult for operators to study, she explained.

"One of the big issues with training is that it's often geared toward more complicated systems. If you look online, you could probably find 100 classes on activated sludge but more than 85% of the treatment plants in the U.S. are lagoon systems," Innerebner said. "It's hard to find training on lagoon systems or classes on wastewater treatment ponds."

Additionally, acquiring CEUs and preparing for a certification exam require time. In some cases, operators are given working time to prepare and test; this requires them to get shifts covered. In other cases, operators must use time off to maintain their licenses and training.

In Colorado, for example, week-long operator training classes would meet the entire training requirements for three years, Innerebner said. But this requires coverage at the facility as well as travel expenses.

Other options include online training, which provides more scheduling flexibility. Indigo Water Group has about 650 operators enrolled in online training class.

"Operators like it better so you can do it over time, it's a little easier to incorporate in the day," Innerebner said.

Updating materials

A significant portion of operator training materials, including U.S. Environmental Protection Agency manuals, have not been updated since the late 1970s or the 1980s, Innerebner said. She added that training materials typically have been based on work practices at facilities instead of scientific research.

"We have learned a lot about wastewater treatment in the last 40 years. A lot of stuff has changed how we teach, has changed our understanding of the process," she said.

"We've been in a cycle of asking people in the field what they do every day at work and then basing training materials on that instead of setting standard practices based on scientific research. The result is a cycle that always looks backward instead of forward," she explained.

To provide new training materials, WEF developed the Wastewater Treatment Fundamentals series. In addition to being double-peer-reviewed by water sector experts, the series aims to assist in translating the world of wastewater treatment to individuals who have held technical jobs outside of the water sector. "I try to take new concepts and relate them back to what people already know. It's easier to hang things on your framework than to build a new framework altogether," Innerebner said. Because many operators come from mechanical backgrounds, it helps to relate new topics to familiar ones, she explained. For example, biology and bacteria can be compared, albeit imperfectly, to engines.

"Live with the imperfect analogy until you can get a better understanding of what's actually happening," Innerebner said. "That goes a long way with helping people learn."

Keeping pace with technology

Utilities and trainers work to keep pace with rapid technological

changes to ensure their staff and operators are prepared to handle new equipment. This has led to training that focuses primarily on technology at a facility. While this training is valuable, it needs to be coupled with education on the general curriculum.

"I am seeing more clients asking for very specific training on the technology they have at their location, on-site training for specific technology," said Scott Jameson, a water and wastewater operator trainer and consultant in British Columbia, Canada. Jameson offers classroom courses and on-site training for utilities in the region.

Sometimes the tech training is to reduce a knowledge gap after losing a senior operator; other times, however, utilities are trying to multitask and prepare operators for certification exams and train them on new technology at the same time, Jameson said.

"I find them more and more willing to pay to have an instructor to come to their sites," Jameson said. "This is tied into the idea that they want training focused on the technology they are using."

He cautioned, however, that this doubling up doesn't work well if the goal is to pass a certification exam. Jameson said he takes the time to sort out this difference with his clients. He works with them to clarify their objectives to provide the training truly needed.

The Operations Challenge competition held annually at WEFTEC and similar state and regional events are examples of programing that combines operations training and skill development with practice on new technologies. To keep the competition fresh and challenging, the events are redesigned periodically. These events introduce competitors to new processes and technologies and provide hands-on experience with new and different equipment.

Apprentice programs and technical schools

One highly visible path through which newcomers can enter a water sector career is apprenticeship programs or technical schools. Some utilities have created these programs or built partnerships with local colleges to help facilitate the education and hands-on training necessary for an operator position.

South Platte Water Renewal Partners (formerly known as the Littleton Englewood Wastewater Treatment Plant) has done both. Cindy Goodburn, a WEF member who now works as an independent consultant to help organizations improve workforce development and organizational skills, started the apprentice program in the 1990s when the utility struggled to fill Operator A positions.

> "I think that's philosophically what the management was looking for: those people that really wanted to reach, grow, and really make a career out of it, not just a job."

"At the time, we were focused on the A certification. Most A operators are really secure where they are working. They have the 'golden chain,' fully vested in all of their retirement stuff, maxed out on vacation – all those benefits that make it difficult to leave and start with a new organization," she explained. "Our answer to the golden chain was that we would build our own."

Though there have been some changes, the goals of the apprentice program remain the same. Operators are given a designated time frame in which to obtain higher certification levels; they are incentivized with pay increases.

"Each time the person passed a new certification, they got promoted to a new operator certification and received a payline raise. We paid for all of their schooling, their books, certification exam," Goodburn said. "But their end of the deal was that they had a certain timeframe in which to complete these [tasks]. The goal was to get all our operators A-certified and there was a maximum amount of time. If at any of those points they couldn't pass the exam, we would have to terminate employment. But we've only had to do that a couple of times over all these years [that we have had this program]. It's just been a huge success."

This facility also maintains a partnership with a local community college with a water quality management program. Many of the college students interned at the facility as part of their curriculum. These same students later joined the apprentice program to become operators.

Goodburn noted that utilities can help direct curricula at technical colleges to ensure colleges prepare students for workforce needs. For example, when supervisory control and data acquisition systems were introduced to the facility, few staff possessed the needed skills to use them. As Goodburn searched for employees or students to fill the role, she discovered that the community college was providing an outdated curriculum.

"The instrumentation and controls [curriculum] were in the electrical degree programs and it was so antiquated [that] it wouldn't do us any good," she said. "That's kind of my soapbox on partnering with local educational institutions and helping them understand what is needed in the industry for their students to graduate and get into a job."

Taking this collaboration one step farther, the Water Engineering Technology (WET) Program at Okanagan College in Kelowna, British Columbia has a curriculum

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recognized by the Environmental Operators Certification Program, which is the main certifying entity for the region. The WET Program also is a nationally accredited engineering technology program. All certified engineering technology programs are mandated to meet regularly with an advisory committee to determine curriculum and skills needed for the workforce.

"We have to keep in contact with the industry. All of the Engineering Technology programs are mandated to have a Program Advisory Committee comprising individuals from different industries that our students would go and work in," said Allison O'Neill, Chair of the Water Engineering Technology Department. These committees "advise us on changes in the industry. We also ask them about our curriculum [and] when we propose curriculum changes, they review those changes to ensure they fit with the need of the industry."

The committees include members from public and private sector organizations, including local municipalities, the water resource recovery facility, consultants, urban planners, as well as representatives from the Province of British Columbia's Ministries of Environment & Climate Change Strategy and Forests, Lands, Natural Resource Operations & Rural Development.

"We make sure that we have broad representation. We also try to make sure that our advisory committee includes WET graduates who are working in the industry because they understand both the curriculum and the industry," O'Neill said.

Interactive development

The Brookings report also includes recommendations to involve stakeholders in training development. The report suggests that since water workers are required to maintain CEUs, utilities and other water employers should provide additional frameworks and "develop competency models – or customize existing models – to promote continued learning and skills development among staff."

Tasks associated with this development include defining and measuring types of knowledge, skills, and abilities needed among water workers within the organization. The report also recommends creating more robust programs to introduce younger, nontraditional workers to the water sector to acquire hands-on experience.

Goodburn noted that the success of the apprentice program is based on supporting staff and operators at each level of their career and providing training and opportunities to move upward.

"One of the things we were successful at was developing people in their careers," Goodburn said. "I used to tell my staff – and it would freak them out – 'I want you to work yourself out of your job every five years, but I want your new job to be here, with us, at Littleton/Englewood.'"

"I think that's philosophically what the management was looking for: those people that really wanted to reach, grow, and really make a career out of it, not just a job. I think that has really been the success in the apprentice program and throughout the rest of the organization because people do have the opportunity to grow."

Katherine Saltzman *is a publications assistant at WEF (Alexandria, VA), where she works on WEF's Operator Initiative programs.*

Roland P. Richard, P.Eng., FEC

CWWA "snapshot of activities"

Greetings to all and hope you all enjoyed a great summer and now getting ready for a great white and cold winter. My article will provide a snapshot of CWWA activities and an update on its key initiatives.

There continues to be exciting developments with CWWA as the value of working on national and international initiatives is resulting in positive outcomes.

With a federal election coming this fall, this is a good time to look at what is going on at that federal level and within your national association. CWWA has been very busy as "THE National Voice" for our water/wastewater sector.

After years of advocacy for infrastructure renewal, we have seen significant federal funds directed to the Canada Infrastructure Plan with specific funds identified for water projects including First Nations. CWWA has worked closely with the Federation of Canadian Municipalities on how some of these funds are distributed though the Green Municipal Fund and other community capacity building programs (asset management and climate change). This government is very focused on climate change with a directed effort to address flood risk. CWWA represents our sector on the Flood Risk Advisory Council and is participating in two work groups – flood mapping and financial relief programs/ insurance. We should start to see new mapping information and portals in 2020 and more national discussions on storm water management expectations.

We hosted another successful Window on Ottawa event this past June with conversations around the Wastewater Systems Effluents Regulations (WSER) and how they are being implemented across the country. There were also presentations around infrastructure planning, climate change, and discussions of the newest Drinking Water Guidelines on Lead (Pb) and Manganese (Mn).

Meanwhile, our CWWA technical committees have been very busy, sponsoring research, producing reports, and proposing national positions. The Efficiency Committee has produced three reports, all available on the CWWA website, including pump efficiency and high water users. But ACWWA members should appreciate the efficiency committee's report on food grinders – this is a good overview of all the factors a community should consider when developing policies around the topic of food grinders. Our Flushable Wipes group, along with MESUG, sponsored research at Ryerson University into the ability (non-ability) of wipes to breakdown in our wastewater systems. This report verified that few products meet their advertised claim of 'flushability.' Another study at Western University demonstrated that few manufacturers even met their own code of practice for labeling of products. These reports have led to a formal complaint to the Canadian Competition Bureau calling for $230 million in fines against wipes makers.

CWWA's Biosolids Committee is part of a renewed national committee on biosolids and an effort to gather credible science resources to support municipal biosolids programs. In 2018, CWWA's Security Committee completed a research with Dalhousie University on resilience of our operations and is working with Public Safety Canada on developing national standards and programs. The CWWA Utility Leadership Committee produced a position paper on Sustainable Utilities and is now developing a more detailed Guidance Document to support that position.

CWWA is also your representative to the IWA (International Water Association). In June we hosted the IWA's Young Professional Conference at Ryerson. Led by Ontario YPs, they welcomed delegates from around the world. CWWA will host the IWA's Asset Management and Performance Indicators Conference in Vancouver in September. And in 2022, we will bring the world to Toronto for the IWA World Water Congress.

Other CWWA collaborations

CWWA continues to facilitate cooperation amongst many national water organizations such as the Canadian Water Network, Canadian Association for Water Quality, Canadian Public Works Association, Canadian Water Resources Association, Canadian Network of Asset Managers, Public Sector Digest, the Federation of Canadian Municipalities and more. As CWWA addresses federal legislation and policies, CWWA also works to strengthen the collective voice from this municipal water sector.

In the meantime, CWWA will host the National Water & Wastewater Conference – this year we are in Banff, November 3–6 and we hope to see you there.

Please mark your calendars:

National Water & Wastewater Conference – 2019
November 3–6, 2019
Fairmont Banff Springs Hotel
Banff, Alberta

Should any other information be required on CWWA activities or initiatives, please do not hesitate to contact me directly at *roland.richard@nb.sympatico.ca* or visit the CWWA website at *www.cwwa.ca*.

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Julie Stokes (ACWWA Membership Director)

Membership update

Here is a brief update on our membership numbers.

Welcome to our new members

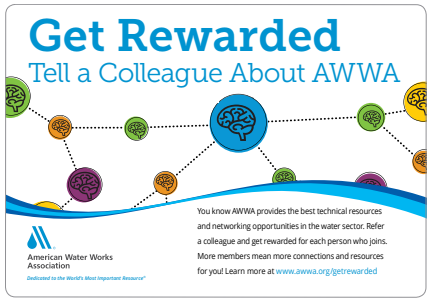
Name	Organization	Membership
Dave Hiscock	Town of Portugal Cove-St. Philips	AWWA
Charlie Hamlyn		AWWA
Chad LeBlanc	Town Council of Pouch Cove	AWWA
Brian Peach		AWWA
Naveed Majid	Veolia	AWWA
James Carew	Aqua-Check Inc.	AWWA
Lesley Shea	Dalhousie University	AWWA
Meaghan MacGillivray	Dalhousie University	AWWA
Jarvis Singer	Halifax Water	WEF
Doyle Whitt	Town Of Gander	WEF
Carl Cleary	Sansom Equipment Limited	WEF
Organization		**Membership**
Town of Yarmouth		AWWA

As of August 2, 2019:
Total AWWA active members: **421**
Total AWWA late members: **19**
Total WEF active members: **102**
Total WEF late members: **28**

Refer a member contest

Refer a member and you will be entered in our "refer a member" contest for a chance to win a $50 gift card of your choice.

For more details, contact Julie Stokes at *julie.stokes@moncton.ca*.



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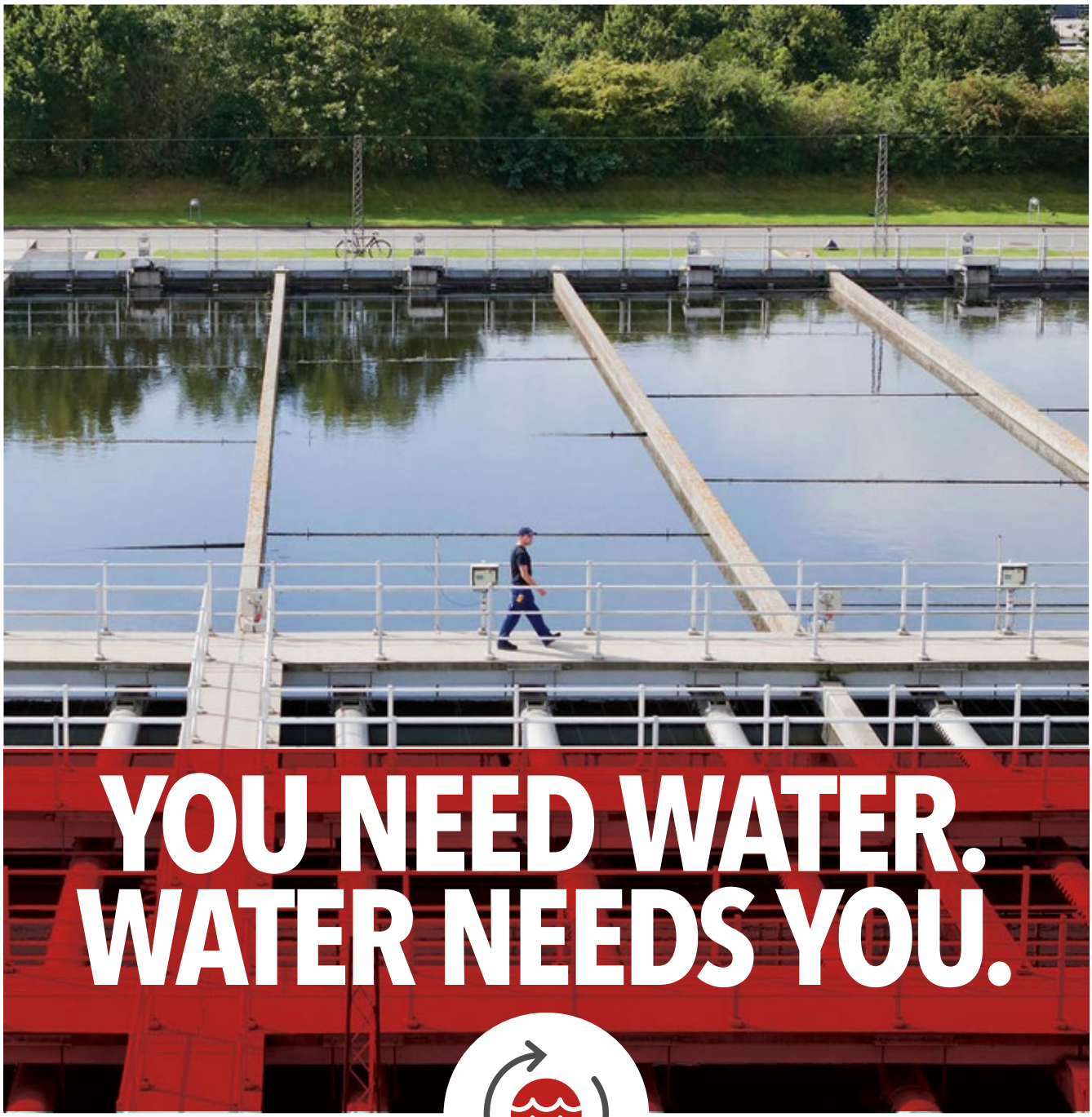

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Water Environment Federation®
the water quality people®

Winner of the Silent Hero Award, Fenton Bambrick, PEI

1. **Job title:** Meter person.
2. **Who do you work for?** City of Charlottetown Water & Sewer.
3. **Where do you currently live?** Charlottetown, PEI.
4. **Where did you grow up?** Brackley.
5. **When I'm not working, I'm...** relaxing.
6. **The accomplishment I'm most proud of is...** getting married and raising three kids.
7. **If you could go on a road trip with any one person (living or dead), who would it be and where would you go?** My wife, and take a trip to Holland.
8. **What is your philosophy on life?** Stay low, stay quiet, keep it simple. Don't expect too much; enjoy what you have.
9. **Toughest thing about your job?** Nothing.
10. **When you were a kid, what did you want to be when you grew up?** Like my father.
11. **Last book you read?** *The Dirt: Confessions of the World's Most Notorious Rock Band* (Mötley Crüe).
12. **Last movie you saw?** Avengers: Endgame.
13. **What music did you listen to this morning?** Classic rock.
14. **Favourite TV show?** The Blacklist.
15. **What was the best gift you ever received?** A new set of golf clubs.
16. **What's the most useless thing you ever purchased?** Diet water.
17. **Not many people know that I...** was on the debate team in high school.
18. **What is your greatest luxury?** Being free.
19. **What's your favourite famous quote?** "Life is what happens when you're busy making other plans."
20. **Describe your perfect day.** Helping someone out of a difficult situation.
21. **What three objects would you rescue from your burning house?** Golf clubs, TV, and laptop.
22. **Who is the most influential person in your life?** My grandmother.
23. **What is your ideal vehicle?** A new GMC truck.
24. **How long have you been a member of ACWWA?** 16 years.

Recognizing our current members

As we prepare for the upcoming ACWWA Annual Conference to be held in Halifax, NS, October 6–8, 2019, we would like to take this opportunity to recognize, and thank, our current ABEA members – without whose continued support we would not be able to contribute to the annual conference in such a meaningful way.

- *ADS*
- *Armour Valve*
- *APS*
- *Aqua Data Atlantic*
- *Avensys*
- *Bibby-Ste-Croix*
- *BirkscoAqualoader*
- *BioMAXX*
- *Coastal Controls*
- *Clow*
- *Campbell's Concrete*
- *Cambridge Brass*
- *Canada Pipe*
- *Chemline*
- *Concord Supply*
- *DLR Piping Solutions*
- *Denso Na-Can*
- *Denyg Mechanical*
- *EEP*
- *Flowstar Ind.*
- *Ford Meter Box*
- *Greatario Engineered Storage Systems*
- *Gorman Rupp*
- *Galaxy Plastics*
- *Hetek*
- *HACH*
- *H2Flow*
- *Ipex*
- *Integrity Pipeline Products*
- *Innoquip*
- *John Brooks*
- *KD Pratt*
- *Kemtag*
- *Liberty Pumps*
- *Landmark Structures*
- *Maritime Infrastructure*
- *McLennan/EMCO*
- *Mueller*
- *Natpro-DXP*
- *Neptune*
- *Nulantic*
- *Napco-Royal*
- *Omnitech*
- *Pure Technologies*
- *ProMinent*
- *Panel Shop/Pennecon*
- *Pro-Line Fittings*
- *PR/SPE Sinoco*
- *Sansom*
- *Scotia Tech*
- *Sensus/KTI*
- *ShadComm*
- *SIGMA*
- *Soleno*
- *Star Pipe*
- *Sulzer*
- *Saunders*
- *Veolia*
- *Veronics*
- *WWOTC*
- *Wolseley*
- *WSP*
- *Xylem*

Current 2018–19 ABEA Board

President	Mike McDonah
Past-President	Steve Philpott
Vice President	Eric Landry
Senior Director	Ryan McCashion
Junior Director	Andrew Duguay
Sec/Treasurer	Kyle Gracie
Director/Liaison	Catherine Cameron

ABEA *www.abea.biz*

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OCT. 6-8, 2019

HALIFAX, NS

UNCHARTED WATERS

PREPARING FOR THE UNKNOWN

Water Environment Federation
the water quality people

ATLANTIC CANADA
WATER & WASTEWATER ASSOCIATION

American Water Works Association
Atlantic Canada Section

CONFERENCE HIGHLIGHTS

10.06.2019 SUNDAY

10.00 AM	ABEA Golf Tournament at Lost Creek Golf Club & Village
1.00 PM - 4.00 PM	Young Professionals Event
1.00 PM - 3.30 PM	Technical Tour of Lake Major Dam
5.00 PM - 7.00 PM	Young Professionals Meet & Greet, The Lower Deck (2nd Floor)
7.30 PM - 10.30 PM	Meet & Greet Reception, Sable Ballroom
8.30 PM - 9.30 PM	Water Tower Competition, Sable Ballroom

10.07.2019 MONDAY

7.30 AM - 8.30 AM	Continental Breakfast
8.30 AM - 10.00 AM	Opening General Session, Nova Scotia Rooms A & B
10.30 AM - 12.00 PM	Technical Sessions, Halifax Rooms A, B & C
12.00 PM - 1.30 PM	ACWWA AGM & Awards Luncheon, Nova Scotia Rooms C & D
1.30 PM - 4.45 PM	Technical Sessions, Halifax Rooms A, B & C
5.00 PM - 6.00 PM	Water for People 5K Fun Run/Walk
6.00 PM - 8.00 PM	Dine On Your Own – Explore Downtown Halifax
9.00 PM - 1.00 AM	ABEA Common Hospitality Reception, Schooner Room, Casino NS

10.08.2019 TUESDAY

7.30 AM - 8.30 AM	Continental Breakfast
8.00 AM - 9.30 AM	Technical Sessions, Halifax Rooms A, B & C
9.30 AM - 10.30 AM	"Best of the Best" Tap Water Taste Test
10.00 AM - 2.00 PM	ACWWA/ABEA Tradeshow, Nova Scotia Ballroom
2.00 PM - 4.00 PM	Technical Sessions, Halifax Rooms A, B & C
6.30 PM	Down East Feast, Nova Scotia Ballroom

2019 ABEA ANNUAL GOLF TOURNAMENT

We welcome you to join us for our Annual Golf Event being held at 10:00 AM on October 6, 2019 – sponsored by the ABEA, and its individual members.

LOST CREEK GOLF CLUB AND VILLAGE

$75+ tax

Includes: Green fees, shared cart & range balls

Transportation & lunch will be provided.

YOUNG PROFESSIONALS SEMINAR

The Young Professionals Committee is inviting conference attendees to sign up for the YP Seminar, which is being held from 1:00 PM to 4:00 PM on the opening day of the conference, Sunday, October 6.

This year, the seminar is themed "How to navigate your social and professional network" and will feature presentations on topics such as professional development using social media, entrepreneurship and startups, and maintaining a work/life balance.

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12TH ANNUAL ABEA COMMON HOSPITALITY RECEPTION

The Atlantic Branch Equipment Association cordially invites all ACWWA Conference delegates and attending members to join us for an evening of music, mingling, and munchies at Casino NS – Schooner Room, on Monday October 7, 2019.

Festivities run from 9:00 PM – 1:00 AM, with music supplied by Monkey's Uncle – a local favourite. Check out Monkey's Uncle on Facebook and Twitter: *@monkeysunclehfx*

2019 ACWWA & ABEA TRADE SHOW

The 2019 Trade Show will be held Tuesday morning, October 8, 2019, beginning at 10:00 AM, offering 80 booths.

HANDS-ON TECHNICAL DEMO

Safe and Efficient Measures When Hot Tapping Pressurized Watermains – Large Diameter
12:30 PM
ABEA Trade Show space (Nova Scotia Ballroom)
Presented by Mueller and the City of Charlottetown.

TECHNICAL TOUR: THE NEW LAKE MAJOR DAM

The existing Lake Major Dam is a rock-filled timber crib structure which was originally built for a private milling operation in the 1940s. In 2012, as part of Halifax Water's Dam Safety Program, a study concluded that the Lake Major Dam needed to be replaced due to its age and location.

Starting in 2014, Halifax Water began the concept design and environmental approvals process in to complete the replacement project. Construction approval from the regulatory bodies was received in May 2018 with construction starting early June 2018.

The new dam is a concrete structure, complete with a labyrinth spillway, adjustable weir fish ladder, and two low-level sluice gates.

Transportation will be provided.

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FOR MORE CONFERENCE INFORMATION AND TO REGISTER ONLINE FOR THE 2019 ACWWA ANNUAL CONFERENCE IN HALIFAX, PLEASE VISIT WWW.ACWWA.CA.

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Congratulations to the 2019 **Canadian Stockholm Junior Water Prize** winners!

Emily Mah & Jazlyn McGuinty

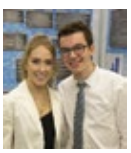
Widdifield Secondary School
North Bay, Ontario

Congratulations to Emily and Jazlyn who came in first place for their paper titled *Bannin' with Tannins: A Heavy Metal Extraction Process for Contaminated Water.*
Award Total $300

Biopolymer was embedded with mechanically isolated tannins then used to extract sample heavy metals from contaminated water. The results were measured using the change in mass, change in clarity, change in concentration of metal in water, and the effects on radish seeding germination. Overall, it was found that using biopolymer was an eco-friendly way to remove heavy metals from water.

Annie Bloomfield & Malcolm Cameron

2019 CSJWP runners-up from Antigonish, NS



Dr. John Hugh Gillis Regional School
Project title: *Grey is the Way: Developing a Residential Greywater Treatment*
Award Total $300
The purpose of this project was to make household wastewater recyclable. Annie and Malcolm created a natural clarifier to treat the wastewater and used this in combination with a series of filtrations to reach their goal. The water treatments can be used to reduce freshwater usage in houses by 26–30%. It can be used for toilets, showers, washing machines, gardening, and more!

About the students:
My name is **Annie Bloomfield**. I am a grade 12 student from Dr. John Hugh Gillis Regional High School in Antigonish, Nova Scotia. I will be taking Medical Science at Western University this fall. I work on a horse farm and enjoy horseback riding, dance, art, music and 4H. I also really enjoy science... I love taking a pressing issue and creating a solution for it. My partner, Malcolm, and I were very interested in experimenting with water pollution and alleviating the residential use of freshwater. Plans for further investigations would include experimenting on a larger scale and introducing a vacuum to our system to extract biodegradable sediment.

My name is **Malcolm Cameron** and I am a grade 12 student from Antigonish, Nova Scotia. In the fall of 2019, I plan to attend Dalhousie University to take Medical Sciences. I have been a competitive swimmer for nine years, I am student council co-president of my school, and I teach kids swimming lessons. My partner, Annie, and I originally started a project to find a way to clean ocean pollution. It didn't quite work out, so we looked into household wastewater clarification. With more investigation, we hope to include a vacuum to our filtration system to extract biodegradable sediment.

Dieppe mobile water stations

Have you seen our new mobile water station yet? This initiative from the participatory budget project is another step towards a more eco-friendly water consumption. From now on, you can bring your reusable bottles or even drink directly from the station during the municipality's summer activities, for free!

Avez-vous aperçu notre nouvelle station d'eau mobile? Cette initiative issue du projet de budget participatif est un pas de plus vers une consommation d'eau écoresponsable. Vous pouvez maintenant apporter vos bouteilles réutilisables ou même y boire directement durant les activités estivales de la municipalité, et ce gratuitement!

Send your news items to:

Julie DiCicco,
ACWWA Magazine Chair

Julie DiCicco
jdicicco@dillon.ca

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Upcoming ACWWA courses

The following is a list of the upcoming ACWWA fall courses. All registrations and payments can be completed online at ***www.acwwa.ca/courses/courseschedule.html***. Please check the website for new course listings.

NOVA SCOTIA

Water Treatment, LEVEL I & II
Halifax, NS, September 24–27, 2019
Non Member Price: $1,121.25
Member Price: $1,029.25

Check Valves and Air Relief Valves
Halifax, NS, October 9, 2019
Non Member Price: $181.13
Member Price: $169.63

Introduction to Trenchless Technology – Rehabilitation
Halifax, NS *(NEW LOCATION)*
October 9, 2019
Non Member Price: $345.00
Member Price: $316.25

Wastewater Collection, LEVEL I & II
Halifax, NS, November 19–22, 2019
Non Member Price: $1,121.25
Member Price: $1,029.25

NEW BRUNSWICK

Water Distribution, LEVEL III
Moncton, NB
September 30 – October 3, 2019
Non Member Price: $1,121.25
Member Price: $1,029.25

Water Distribution, LEVEL I & II
Moncton, NB, October 21–24, 2019
Non Member Price: $1,121.25
Member Price: $1,029.25

Wastewater Treatment, LEVEL I & II
Moncton, NB, November 4–7, 2019
Non Member Price: $1,121.25
Member Price: $1,029.25

PRINCE EDWARD ISLAND

Waterbourne Disease
Charlottetown, PE, October 15, 2019
Non Member Price: $343.85
Member Price: $322.00

NEWFOUNDLAND

Automatic Diaphragm Valves
St. John's, NL, October 15, 2019
Non Member Price: $362.25
Member Price: $339.25

Automatic Diaphragm Valves
Gander, NL, October 16, 2019
Non Member Price: $362.25
Member Price: $339.25

Check Valves and Air Relief Valves
Corner Brook, NL
October 17, 2019
Non Member Price: $181.13
Member Price: $169.63

Pressure Management to Reduce Non-Revenue Water (Water Loss) and Pipe Bursts
Corner Brook, NL
October 17, 2019
Non Member Price: $181.13
Member Price: $169.63

Wastewater lift stations and forcemains

By John Lam

In central wastewater systems, wastewater is collected and conveyed to the wastewater treatment plants via sanitary sewers. The most common are "gravity" sewers which are intentionally sloped to allow the wastewater to flow by gravity to the treatment plant or to a low point in the system. Lift stations are used to move wastewater from a low point in the collection system to a higher elevation.

A lift station consists of several main parts:

- Wetwell chamber
- Pumps
- Controls
- Forcemain

Wastewater typically flows into the wetwell chamber via gravity sewers. The wastewater is collected in the wetwell and the liquid is allowed to rise until it reaches the "pump on" level. The control system will then turn one or more of the pumps on, pushing the wastewater through the forcemain to discharge at a higher elevation, typically into a manhole or to a wastewater treatment plant.

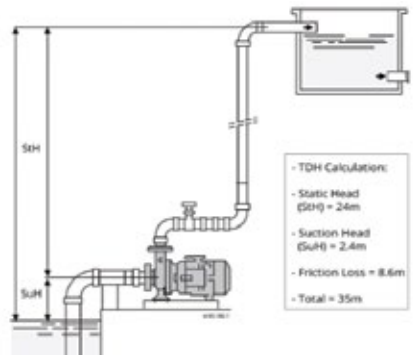
The pump would typically continue to discharge wastewater until the liquid level drops down to the "pump off" level in the wetwell. The control system will then turn the pump off. A check valve located at the pump discharge prevents the forcemain contents from flowing back into the wetwell when the pumps turn off.

The pumps are designed to overcome the resistance to the flow of liquid through the plant piping (including suction piping), forcemain and appurtenances, as well as the elevational lift from the wetwell to the point of discharge or the highest point in the forcemain. The resistance to the flow of the liquid is called frictional headloss or head, expressed as a unit of pressure such as Pascal (Pa) or pounds/in^2 (psi). These units can also be converted so that they are expressed as height of water column such as m or ft of H_2O.

Frictional headloss can be viewed as the resistance to flow that is caused by drag of the pipe wall on the fluid (in this case wastewater) as well as minor losses such as resistance to flow through valves, fittings, contractions or expansions. Minor losses are added to frictional losses, typically expressed as equivalent length of pipe to be added to the actual length of the forcemain. Factors affecting the frictional headloss include the following:

- Viscosity of the liquid
- Roughness of the pipe interior
- Age of pipe
- Pipe internal diameter
- Pipe length
- Velocity of the liquid
- Flow regime (lamina versus turbulent)
- Valves, fittings, and changes in diameters
- Temperature

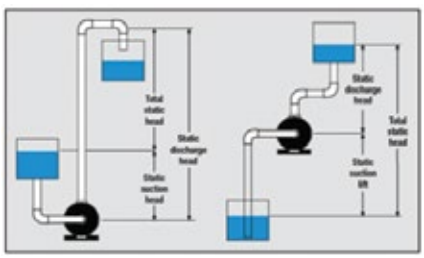
The driving head required to overcome headlosses and to transport the wastewater to the final discharge point is called total dynamic head (TDH). TDH is the sum of the frictional headloss, minor headloss, and total static head. See below for example.



Frictional headloss can be calculated using a number of formulas including:

- Hazen-Williams formula (most common)
- Darcy-Weisbach (most accurate)

Selection and design of pumps for a lift station should consider the net positive suction head (NPSH) available versus the NPSH required.



NPSH available is a function of the following factors:

- Atmospheric pressure on the surface of the liquid in the supply tank
- Vertical distance between the surface of the liquid in the supply tank and the centreline of the pump (plus or minus)
- Friction losses in the suction pipe
- Velocity head at pump suction port
- Absolute vapour pressure of liquid at the liquid temperature

"Selection and design of pumps for a lift station should consider the net positive suction head (NPSH) available versus the NPSH required."

NPSH required is pump specific and a function of the operating speed or flow rate.

As you can see, the design of lift stations and forcemains requires knowledge of fluid dynamics, and consideration of a number of factors and operating conditions. Design professionals can turn to equipment vendors, who are often eager to help in the selection of pumps and identification of maintenance requirements. ACWWA offers technical courses to provide additional training and continuing education on this and other topics.

The "Back to Fundamentals" department is published in each edition of *Go With the Flow* magazine. It is intended to cover a broad range of fundamental water and wastewater topics that will be driven by you, the readers of this magazine. If you find a topic particularly interesting or confusing, most likely others do as well. Please forward your ideas for future columns to Kyle MacIntyre, Dillon Consulting (*kmacintyre@dillon.ca*) or John Lam (*john.lam@novascotia.ca*) and we will respond in future publications to your queries.

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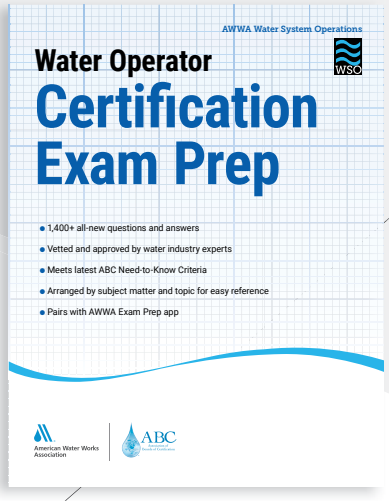

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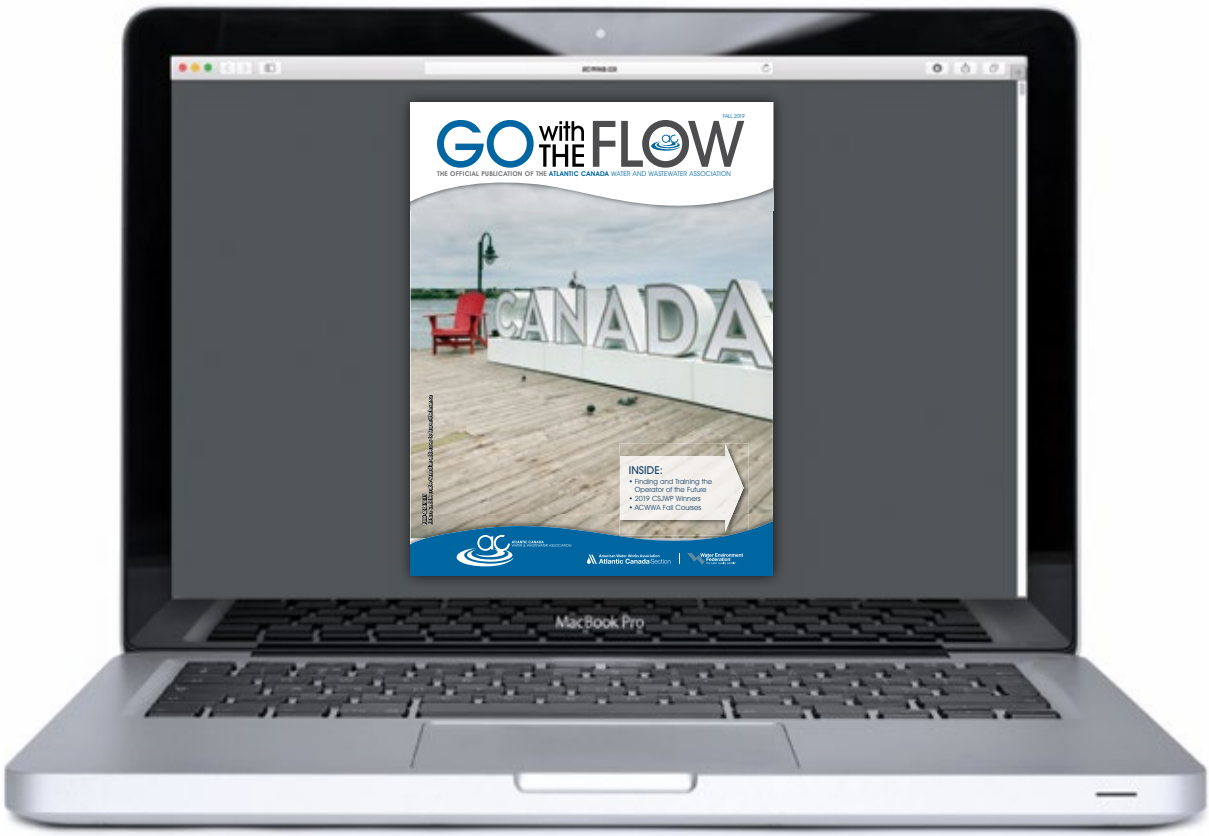

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Concord Supply	24	877-436-3800	www.concordsupply.ca
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EXP	28	506-452-9000	www.exp.com
Flowstar Industrial	24	902-896-0041	www.flowstarind.ca
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Halifax Water	36	902-490-4840	www.halifaxwater.ca
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Kemtag Enterprises Limited	33	506-852-4004	www.cla-val.com
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Markland Specialty Engineering, Ltd.	8	855-873-7791	www.sludgecontrols.com
McLennan Sales, Division of EMCO Corporation	36	506-634-3112	www.mclennansales.com
Mueller Co.	3	800-423-1323	www.muellercompany.com
NETZSCH Canada Inc.	30	705-797-8426	www.pumps.netzsch.com
Roth Global Plastics	2	866-943-7256	www.rothmultitank.com
Scotia Tech Fluid Services Ltd.	6	902-468-2777	
Soleno	39	450-347-7855	www.soleno.com
The Ford Meter Box Company, Inc.	29	260-563-3171	www.fordmeterbox.com
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SOLENO
Mastering Storm Water

CASE STUDY

Complete HDPE storm water sewer for Candiac Square

STORM WATER MANAGEMENT: A COMPLETE SOLUTION IN HDPE OFFERED BY SOLENO.

The construction project of the Candiac Square, the second most important residential project of Greater Montreal in 2016, included the development of two underground retention system and a complete network of HDPE storm water sewer and treatment system responding to the municipal and provincial governments requirements for storm water management. Supported by our specialized consulting services, this large-scale project was carried out in several phases. The benefits of this economical, simple and fast installation system won over the various stakeholders of the project, to install the first storm water sewer network completely in HDPE.

The Candiac Square, a multi-generational POD type project (pedestrian-oriented development) of more than 600 million dollars of infrastructure investment, was planned for more than 2000 diverse housing units. For the first part of the storm sewer network, the contractor proceeded with the installation of over 630 linear meters of Solflo Max pipes of 1200 mm (48 in) in diameter, as well as around 15 manholes chimney type of 900 mm (36 in) in diameter, welded directly to the Solflo Max pipes. Finally, more than 1290 linear meters of 1200 mm (48 in) diameter Solflo Max pipes will form this HDPE storm sewer network. For each of the two 16 rows retention systems, nearly 480 HydroStor HS180 chambers were installed. The first retention basin will store 2,505 m^3 (88,463 ft^3) and the second retention basin will store 2,475 m^3 (87403,8 ft^3) of water for heavy rain events.

Corrosion, abrasion, de-icing salts and vibration resistant, the use of high-density polyethylene (HDPE) ensures the sustainability of the infrastructure. The development of a storm sewer system completely made of HDPE, an efficient and durable material, can therefore ensure the longevity of the new Candiac Square network.

Lightweight and easy to handle, HDPE products don't require the use of specialized equipment, such as a crane, thus making the installation easier and the execution of the work quicker, key factors that were much appreciated by the contractor, A & J.L. Bourgeois Ltd. The length of the Solflo Max pipes reduces the installation time as well as the number of joints required, compared to traditional concrete pipes. In addition, unlike the traditional concrete manhole, the HDPE manhole does not require oversizing, which allows to reduce the manhole diameter and brings substantial savings both in terms of purchase price and excavation-installation costs. Its welded HDPE design allows the assembly of the inlets and outlets at the factory, which facilitates piping connection on the job site. In addition, thanks to the watertight bells with o-ring gasket (BG) or with integrated gasket (BGI) - patented and exclusive to Soleno - slightly oversized, Solflo Max pipes quickly and easily fit together, bringing significant benefits on the job site. Fitted with clips to validate the quality of the installation as well as the depth of the nesting, the use of watertight bells provides powerful joints and ensure the watertightness of the storm sewer network.

The HydroStor HS180 retention system, made of polypropylene and high-density polyethylene, is easy to install, thanks to the lightweight retention chambers. Its capacity to absorb heavy rain prevents sudden flooding. The HydroStor HS180 retention chambers, designed for heavy volume or restricted available space projects, can store 5.1 m^3 (180.1 ft^3) of storm water per chamber, making them more cost-efficient by greatly reducing the area of the site. The installation of a HydroStor geogrid helps to ensure a solid and stable foundation at the base of the chambers, by distributing linear workloads over a larger surface area.

Sustainable storm water management is a growing concern for municipalities. Development projects must incorporate solutions to solve problems related to the collecting, conveying, treating and storage of storm water.

Our engineers are available to help you identify and implement the best management practices to protect water resources that might be impacted by water runoff in urban or rural areas.

Write to us at **servicetechnique@soleno.com** or visit **soleno.com** to find out about our sustainable solutions for storm water management.

Blower Solutions

ATLAS COPCO SOLUTIONS

Complete Blower solutions for water and wastewater treatment plants.

For every industrial or municipal water and wastewater treatment application, we offer the widest and most diverse range of blowers perfectly selected and suited for your needs. Our range of rotary lobe, energy efficient screw and turbo blowers can offer the perfect solution for any wastewater and water treatment plant.

High process uptime at low capital costs

The simplicity and proven design of our **ZL lobe blowers** make them the perfect match in harsh environments all over the world with limited need for supervision and provide just the right amount of air requested by your application.

The ZL is available in a variety of configurable models. The customer can choose between a purely mechanical unit using dial gauges for pressure reading or the high-end solution with integrated VSD inverter and Elektronikon® controller.

Setting a new energy-efficient standard

Atlas Copco's positive displacement rotary screw technology has now established itself as the most energy efficient alternative to lobe type air blowers.

With its integrated frequency converter varies the speed of the drive motor to match changes in the blower air demand, thus consuming only the minimum amount of energy and can provide savings of up to 35% in energy costs when compared to conventional lobe blowers.

As an additional benefit, the ZS screw blower is fitted with Atlas Copco's Elektronikon® controller which monitors overall system performance and can increase efficiency and reliability by directly controlling the blower's speed to the level of dissolved oxygen in the water.

Cutting edge in blower technology

Atlas Copco **ZB Magnetic Bearing Turbo** blowers have proven their efficiency and reliability over many years. Thanks to the unique design of centrifugal frictionless direct drive, you get a constant air flow and the highest air volume for all your applications such as wastewater treatment aeration system.

On-site service Canada wide

Unlike many other suppliers, Atlas Copco can offer direct on-site service of blower, air compressors and vacuum pump equipment. We have Canada wide network with technicians performing commissioning and maintenance activities in all parts of Canada.

Our local team of expert is ready to help.
Contact us about your needs today!

Atlantic Purification Systems Ltd
Contact name: Hettie Sacre / Ian Johnston
10 Ferguson Road, Dartmouth, NS
Phone: (902) 469-2806
Fax: (902) 463-3529
Email : sales@aps.ns.ca