

THE PROFESSIONAL



EDGE

ISSUE 170

SEPTEMBER/OCTOBER 2017

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President's Message



Ernie Barber, P.Ag., P.Eng., APEGS President

I've been thinking lately about the inter-professional nature of much of the work that we do as professional engineers and geoscientists. I'm reflecting on how this inter-dependency among professions can confound public understanding of the roles of each profession and of the trust that is placed in any one profession.

This issue of *The Edge* contains feature stories about water. The roles of professional engineers and geoscientists will be readily apparent and some of our own APEGS members will be featured. Geoscientists and engineers have major responsibilities to the public for water supply, quality, treatment and stewardship. In much of what we do involving water, engineers and geoscientists will function in collaboration with other professions.

I invested much of my career as an agricultural engineer – as a professional engineer and also a professional agrologist - assisting livestock producers with design and adoption of technologies and management tools important to enhance their business profitability and sustainability. Engineers take a leading role to design solutions intended to optimize animal and animal-product production efficiency, to ensure animal safety and welfare in production and in transport, to maximize worker health and safety and productivity and to minimize negative environmental impacts of animals and animal facilities.

Water management and water quality protection feature prominently in engineering for agriculture. For example, my own work included advocating for and designing site-specific and practical means to get grazing animals out of streams; designing surface and sub-surface drainage in areas of high animal concentration; creating animal shelter and feed storage systems to minimize mixing of precipitation with manure and feed; developing and testing manure and effluent land application technologies to control runoff to streams and drainage to groundwater; assuring safe animal drinking water supply and distribution; and improving biosecurity systems for animals, workers and visitors.

In nearly all of my engineering projects, finding the best solutions for my clients meant working with those in other engineering disciplines and with other professions, including agrology, veterinary medicine, medicine, law and business management.

I do not think that the public, and sometimes even our clients, are able very easily to discern the boundaries among professions. It is incumbent upon us to practice within the scope of our own profession, as defined within Saskatchewan's *Engineering and Geosciences Professions Act*, and to refer to other professions whenever that is appropriate. We can help the public understand the inter-professional nature of what we do, in small and large-scale projects.

Leaders of several professions have recently come together in a *Saskatchewan Self-regulating Professions Working Group*, with strong leadership by our own Executive Director and Registrar, Bob McDonald, P.Eng, MBA, LL.B, to consider and learn from each other in topics of common interest and challenge: These leaders know that what happens with one profession can affect the public trust in all other professions.

Professional engineers and geoscientists design solutions that make the world a better place for everyone to live. As we affirm and celebrate our own responsibilities and accomplishments, we should acknowledge too the intersecting nature of our work with other professionals. Local and global water challenges and solutions are undoubtedly one of those areas of our work that will have us thinking this way.



Something to Brag About?

The January-February issue of *The Professional Edge* is all about you!

Our annual Company Profiles issue will profile Saskatchewan-based engineering and geoscience companies and projects. If you want your company or project profiled, or would like to recommend one, let us know.

Please contact: Professional Edge editor Lyle Hewitt @ lyle@martincharlton.ca

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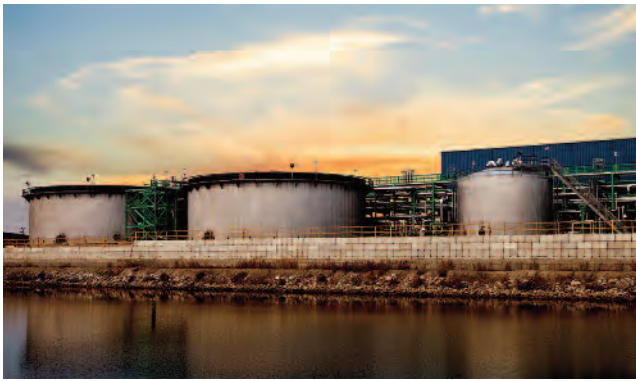
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WIP it Good

The Co-op Refinery's Wastewater Improvement Project (WIP)

BY MARTIN CHARLTON COMMUNICATIONS

Water and oil don't mix, but they do work together at the Co-op Refinery Complex (CRC), thanks to a new wastewater treatment facility at the refinery.

The refinery requires an enormous amount of water to function. Water is used by the CRC to warm pipes, to drive turbines and to assist in chemical processes. It also cools process units. The refinery even runs its own firefighting equipment.

But water, as we all know, is a scarce resource in Saskatchewan. Both Regina's and Saskatchewan's water use has climbed steadily over the years. The city's growing population and the increased use of water in the resource sector have combined to put Regina's water supply under ever-increasing pressure.

"The turning point for us was the Section V expansion. Even before it was complete, we knew we were going to need significantly more water to operate," says utilities engineer John Hiltz, P.Eng.

Although the refinery had enough water to continue to operate even after the expansion, the company's leadership anticipated that a more innovative solution would be needed down the road as outside sources came under more pressure.

The provincial Water Security Agency (WSA) tightly regulates Saskatchewan's water resource and sets strict quotas for industrial and resource sector users. As its use continued to grow, the CRC was faced with the prospect of bumping up against those quotas. The amount of fresh water needed from the City of Regina's source would have climbed higher than what CRC was allowed by the WSA.

"We were using all the water from on-site wells and supplementing this with City of Regina water. We needed to develop a more sustainable way to meet our water needs," says Gil Le Dressay, P.Eng., vice-president of operations at CRC.

To meet this need, recycled water will be used more often. To achieve this, the CRC launched its ambitious Wastewater Improvement Project (WIP). Although it has garnered little media attention, this cutting-edge environmental initiative is one of the largest megaprojects in Saskatchewan at a price tag of over \$200 million.

"This is really leading-edge technology. We have faced challenges along the way, which is natural because it has been a learning process for everyone involved. The sheer scale of the project has created challenges in juggling all of the contractors involved," says Hiltz.

"The Wastewater Improvement Project will allow the refinery to recycle up to 65 per cent of its waste water," says Le Dressay. "We are the first refinery in North America to recycle so much of our waste water for reuse in the oil refining processes."

The CRC's wastewater treatment plant will recycle its waste water using biological technology that can treat the process water more effectively than previous solutions. In the past, the water would have been manually treated to separate oil and solids from the water. Then the City of Regina would have to further treat the refinery waste water at its own treatment plant.

By recycling, the CRC has made impressive strides in reducing its fresh water use. Even though the Section V expansion has increased water use by 30 per cent, the WIP will cut the refinery's fresh water use by roughly 28 per cent. That's the equivalent of the water used by 3,100 households.

Not only will the WIP reduce CRC's water use but it will also deliver a host of other environmental benefits.

"We have four major objectives in this project. First, we want to reduce our general well water use. Then we want to improve the quality of the waste water we produce. Third, we want to reduce the quantity of waste water sent to the city. Finally, we want to improve the air emissions from the water treatment process," says Hiltz.

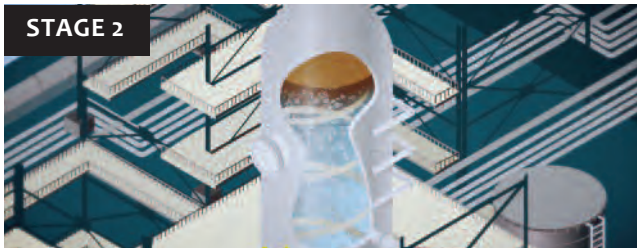
How Refinery Water is Purified

The CRC's recycling technology depends on a combination of biological, mechanical and electrical filtration systems:



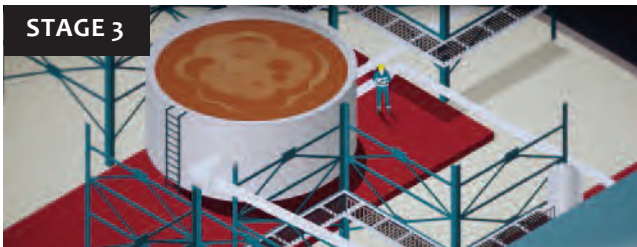
STAGE 1. Separation.

Floating oil is skimmed off and reprocessed within the refinery. Sediment and oily sludge on the bottom are removed and disposed of safely. The remaining water continues on to stage 2.



STAGE 2. Dissolved Gas Flotation Unit.

Microscopic nitrogen bubbles help the remaining oil particles float to the surface of the water where they are removed.



STAGE 3. Membrane Bioreactor.

Special bacteria break down biodegradable volatile organic compounds and ammonia in the water.



STAGE 4. “Zee Weed.”

The water is filtered through spaghetti-like, hollow fibre membranes to remove remaining solids.



STAGE 5. Centrifuge.

The biological material removed in stages 3 and 4 retains some moisture. This is extracted by spinning the materials through a centrifuge.



STAGE 6. Demineralization Plant.

A combination of filters, air pressure, electrical systems and reverse osmosis procedures are used to strip out undesirable chemical compounds.



Something in the Air

The WIP will not only improve CRC's use of water. It will also improve the air.

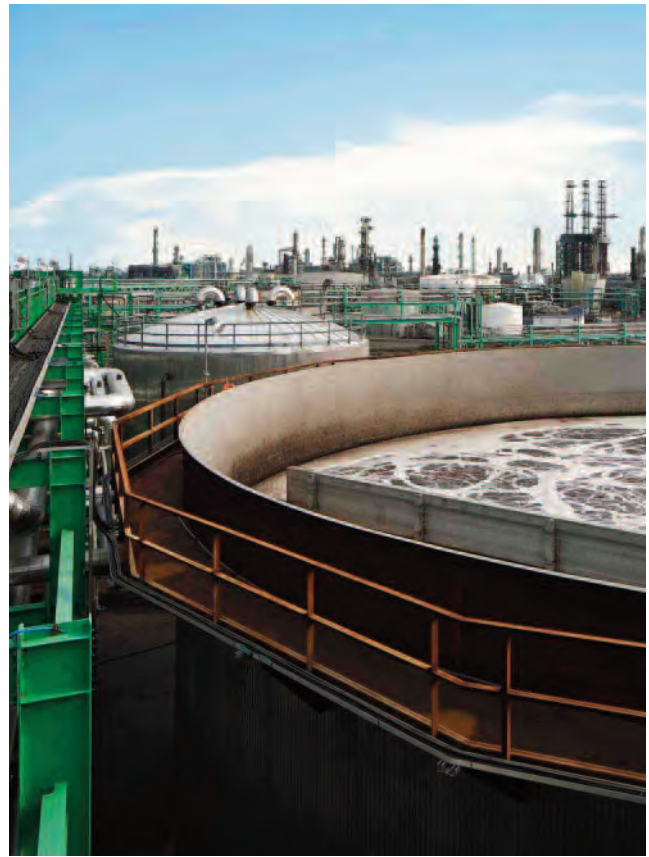
"WIP will also significantly reduce what is technically known as volatile organic compounds or VOCs. In everyday terms, that means bad smells. I think all of us are in favour of fewer bad smells in our city," says Le Dressay.

Air quality and odours have long been sticking points for any refinery located in an urban area.

"VOCs have been a major topic of discussion in the oil and gas industry. There are currently no federal or provincial regulations for VOCs. Refinery staff members are participating in a federal panel to conduct baseline studies so that we can start monitoring and controlling these emissions," says Kendi Young, CRC's environmental affairs supervisor.

The refinery has gotten ahead of regulations on VOCs by investing in the WIP.

"The WIP will reduce VOCs dramatically. Currently our wastewater is aerated in on-site ponds before going to the city. Those ponds obviously give off a lot of odour. Once the WIP has been operational for a while, those will become clean water ponds with little odour," says Young.



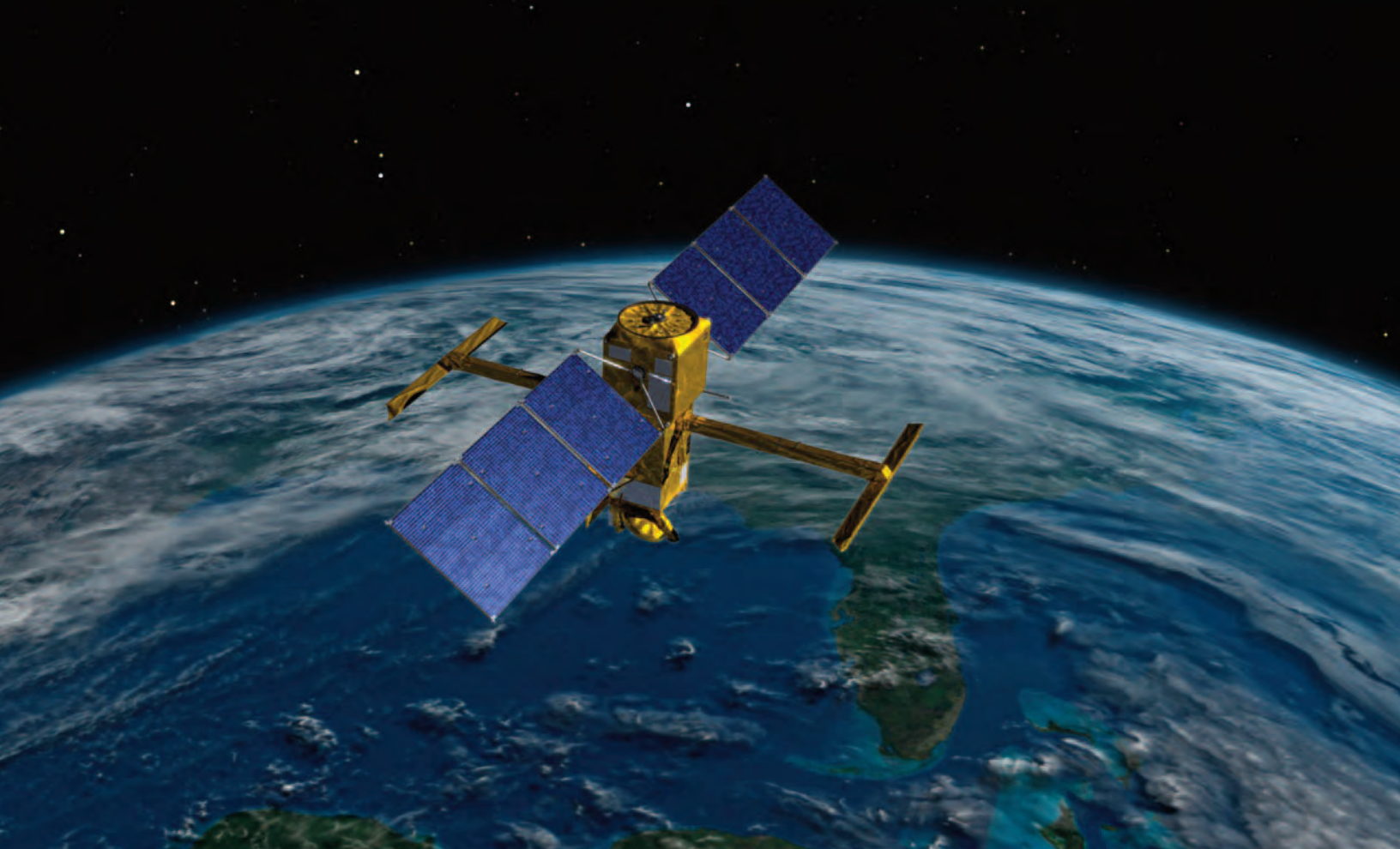
Award winning

It is common for industrial projects to throw around the terms "cutting edge," "leading edge" and "world-class innovation" casually. But in CRC's case, they've got the hardware to prove it.

On April 24, 2017, the WIP was named Industrial Water Project of the Year at the annual Global Water Awards held in Madrid, Spain. The award recognizes the project that

represents the most impressive technical or environmental achievement of the year in the field of industrial water.

"This award belongs to every member of our hard-working team at the refinery. Their dedication and innovation has put the Co-Op Refinery Complex at the cutting edge of sustainable wastewater technology. I want to thank everyone at the refinery for their contributions to this achievement," says Le Dressay.



NASA Sends in the U of S **SWOT** Team

BY HENRYTYE GLAZEBROOK, UNIVERSITY OF SASKATCHEWAN COMMUNICATIONS

Pardon the pun, but Canada is practically overflowing with fresh water. And believe it or not, that abundance causes problems for water researchers.



Al Pietroniro, P.Eng.

“Canada is blessed with more fresh water than anywhere else in the world, but there’s no way you can put sensors in to monitor everything,” said Al Pietroniro, P.Eng., executive director of National Hydrological Services, an adjunct professor with the University of Saskatchewan

and member of the Centre for Hydrology. “It’s too big.” It’s this exact issue that SWOT (surface water and ocean topography) is aimed at solving. The term refers to a satellite scheduled to launch in 2021 by the National

Aeronautics and Space Agency (NASA). SWOT will be capable of measuring surface elevations of any water body large enough for its sensors to collect data on, including the vast majority of Canada’s seemingly infinite northern lakes and rivers.

Water surface elevation is relatively simple information to collect, requiring only limited tools and small teams to venture out to a site and gather measurements. The problem, however, is the time and costs required to make such trips feasible over Canada’s vast landscape. SWOT, if successful, will blow the doors open on the breadth of available data.

“All of a sudden, data that’s only accessible on a 3 or 5 or 10-day basis at a few locations is now available immediately and everywhere, and it’s pretty cost effective in that the



satellite would already be up,” Pietroniro said. “That changes, from an operational perspective, what you would actually be looking at. It changes what you’d be offering as a service to Canadians.”

The project entered its first phase of calibration and validation on July 7, involving a series of sites chosen around the globe at which partner institutions have set up teams and equipment to collect data that can be measured against numbers taken from flyover airplanes (AirSWOT)—designed to mimic eventual SWOT data sourcing—in order to cross-reference accuracy.

“There’s not a lot of data sitting out there and so these calibration sites are designed for us to find out the best way to make sure the satellite is seeing what it’s supposed to see and measuring exactly as it’s supposed to be measuring,” Pietroniro said.

The U of S—one among a list of collaborators including NASA and the NASA Above Programme, Canadian Space Agency, Centre national d’études spatiales, NASA’s Jet Propulsion Laboratory, Environment and Climate Change

Canada, University of North Carolina, University of California Los Angeles and other researchers—has established data collection sites along the North Saskatchewan River, at Redberry Lake and the St. Denis National Wildlife Area.

Pietroniro, referring to the North Saskatchewan River site as one of the project’s “key global sites,” said the U of S is uniquely positioned to be a leader during the initiative, thanks to its robust water research programs including the Global Institute for Water Security, Global Water Futures and three American Geophysical Union Fellows, Howard Wheeler, Jeff McDonnell and John Pomeroy.

“The U of S has peaked at this point with John and Howard and Jeff as examples and there’s a lot more people with the Toxicology Centre and SENS (the School of Environment and Sustainability), to name a few,” he said. “They’re not only probably the most influential water resources group in Canada, they’re globally probably the most influential as well.”

The SWOT project is still in early stages, but already Pietroniro is excited about the potential applications on everything from ephemeral prairie sloughs to permafrost level calculations and water balance calculations once all the kinks are worked out and it launches in earnest.

“Every reservoir in North America is going to be measurable, all the big ones and most of the lakes and rivers,” he said. “How does that change how we deal with water management in this country? That data’s really not always available, so that changes so much in terms of what we’re doing.

“I don’t like using the phrase lightly, but I think it is a paradigm shift. It has the potential to really change how we can manage water in this country.”



The Global Institute for Water Security (GIWS)

SUBMITTED BY GIWS



At the University of Saskatchewan's Global Institute for Water Security (GIWS), sustainable use of the world's water resources and protection against natural hazards such as flood and drought are key priorities.

GIWS is co-located with Environment Canada's National Hydrology Research Centre at Innovation Place and funded through the Canada Excellence Research Chair (CERC) in Water Security, a \$30-million, joint federal-provincial-university commitment over seven years. Led by Dr. Howard Wheater, one of the world's foremost hydrologists, the institute is developing the modelling tools, techniques and policies to sustainably manage the world's freshwater resources.

Officially launched in March 2011, the institute builds upon leading expertise and capacity in water research at the U of S. At GIWS, faculty and government scientists work with students and post-doctoral fellows on interdisciplinary teams to understand how climate change, land management practices and the development of natural resources affect the water environment and to develop the improved modelling tools needed to sustainably manage water. GIWS combines expertise in natural sciences, engineering and the social sciences, recognizing that people and their activities are of critical importance for water science and management.

While the institute's work addresses water issues worldwide, an important focus is on Western Canada. It

is developing the Saskatchewan River Basin as a high-quality observatory with state-of-the-art monitoring of the Canadian Rocky Mountains, boreal forest and prairies. Its research teams are improving our ability to predict river flows and understand how water quality and river basin ecosystems respond to climate change. Through its socio-hydrology research, the institute goes beyond traditional water resources management to integrate humans and their activities into water science and ensure that water decision-making incorporates a range of values and perspectives about the meaning, value and use of water. Its researchers hold workshops and activities throughout the river basin to talk to those engaged in the management of water resources to understand their concerns and what scientific tools are needed to foster water security on the Prairies and beyond.

The GIWS Mission

Create a focus and platform for interdisciplinary collaboration that recognizes the societal dimensions of water security, human impacts on the environment and the linkages and feedbacks between atmosphere, land and water systems. This requires new integration of the relevant spectrum of natural, health and social sciences, public policy and engineering;

Develop the knowledge, science and technologies needed to support integrated water quantity and quality management in the face of uncertain climate and water resource futures and address local, regional and global water security agendas;

Develop partnerships with key stakeholders to translate science into policy and management support to meet water security challenges, including interactions among water, food, energy and ecosystem services (i.e., benefits to human welfare), climate change adaptation and mitigation challenges and the human health agenda;

Provide tools, technologies and computer models for application to key globally significant water security issues, with international application; and,

Create a unique opportunity for governments, industry and universities to invest in and collaborate on one of the most pressing global issues.

Why is Water Quality Testing Important?

BY REBECCA GOTTO, SASKATCHEWAN RESEARCH COUNCIL COMMUNICATIONS

Easy access to clean drinking water is something Canadians often take for granted because of Canada's abundant water sources, from coast to coast. But there's a lot that goes into ensuring the water we drink is safe and clean, including testing.

SRC Environmental Analytical Laboratories tests, on average each year, around 12,000 water samples from over 350 clients all over Saskatchewan. We've provided water quality testing to Saskatchewan municipalities and businesses, as well as homeowners and well owners, for over 50 years.

You've probably heard about, or maybe have even been affected by, a contaminated municipal water supply, either chemical or biological. When this occurs, residents typically are advised to take precautionary measures such as boiling water before consuming or even using it for other purposes.

In an average year, some 500 boil-water advisories are issued in Canada with respect to municipal water supply services. Typically these advisories are in place for a three-to-four day duration, but some stay in place for many years. Because we test a lot of municipal water supplies, SRC is often the first to identify that an advisory or order needs to be put in place. If these contaminants are not identified early on, disaster can strike.

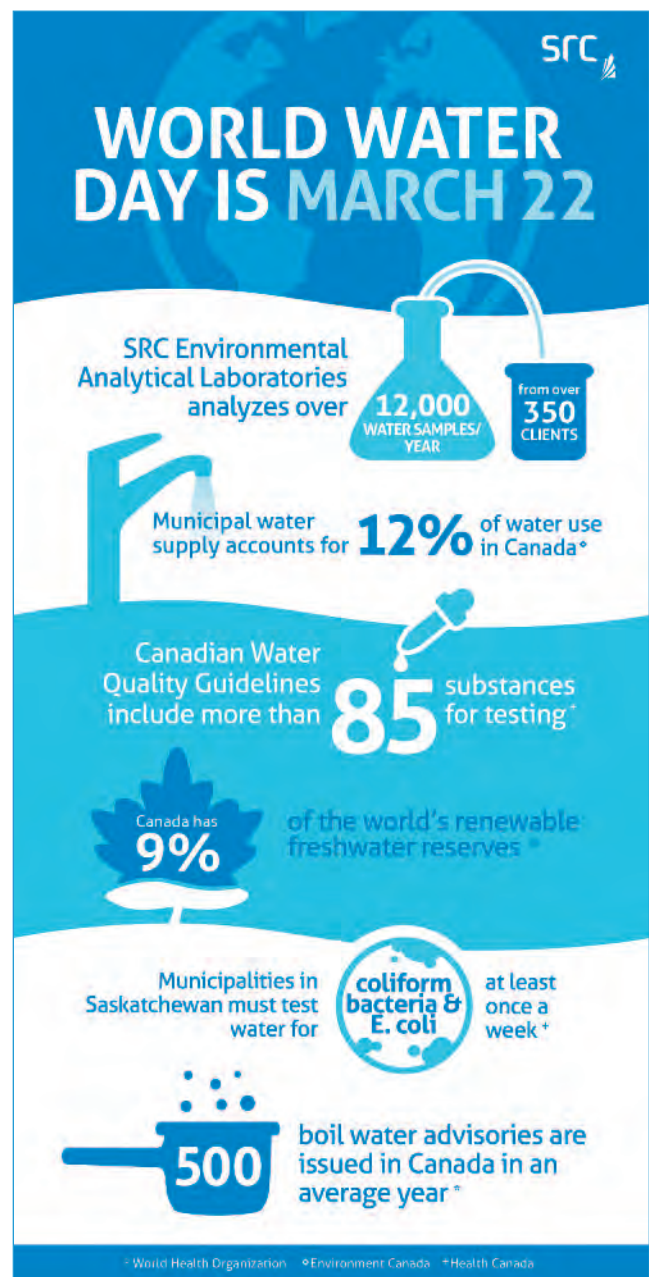
Between 1974 and 1996, over 200 outbreaks of infectious disease associated with drinking water were reported to Health Canada. There were more than 8,000 confirmed cases linked to these outbreaks. In 2000, in Walkerton, Ontario, seven people died and 2,500 became ill due to waterborne pathogens in their drinking water. In 2001, a similar outbreak in North Battleford affected at least 5,800 people.

Water Quality Guidelines

Federal, provincial and territorial governments have collaborated to develop voluntary Canadian Water Quality Guidelines, including for drinking water. These guidelines

help protect the health of Canadians by establishing maximum acceptable concentrations for substances found in water used for drinking. To date, guidelines have been established for more than 85 physical, chemical and biological attributes of water quality.

The guidelines apply to all public and private drinking water supplies and to treated or finished water as it emerges from the tap. The provinces and territories use



these guidelines when creating their own enforceable standards, objectives or guidelines.

In Saskatchewan, the Water Security Agency (WSA) and the Saskatchewan Ministry of Environment share responsibility for drinking water guidelines. There are minimum bacteriological monitoring requirements for surface and groundwater supplies, but typically monitoring requirements are related to the size of a population served by a distribution system. For example, larger municipalities may be required to test more frequently and possibly with a larger number of sampling locations. Other factors could include the nature of the supply, its susceptibility to contamination and whether or not bacteria have been found in the water supply previously.

This routine bacteria testing is the most common water quality test that SRC does for drinking water. If the sample being tested is positive for bacteria, the results are immediately provided to the WSA and a boil-water advisory is put in place. In order for a municipality or business to have that advisory lifted, results must show that two tests done 24 hours apart both come back negative.



World Water Day

From our vast rivers, lakes and oceans to your tap, there are many checks and balances along the way to ensure your water is safe to drink and use. Clean drinking water is something every person on the planet needs in order to stay healthy, so on World Water Day, March 22, pause before you sip that H₂O and remember the journey it's made to your glass.

5 Reasons To Test Your Water

1. It is your responsibility.

If you are the owner of a new or old well, it is your responsibility to ensure the safety and quality of your water.

2. You want a mortgage.

If you are applying for a mortgage on a property with an independent water source, the Canada Mortgage and Housing Corporation (CMHC) requires that the water supply is tested for nitrates and coliform before it will support your mortgage.

3. It stinks.

You notice your water has a rotten egg odour. This indicates the presence of iron or sulphur bacteria. You may also notice a red slime in the toilet tank. These organisms do not pose a health risk, but their presence makes the water unpalatable and can corrode plumbing equipment and clog screens and pipes in your well.

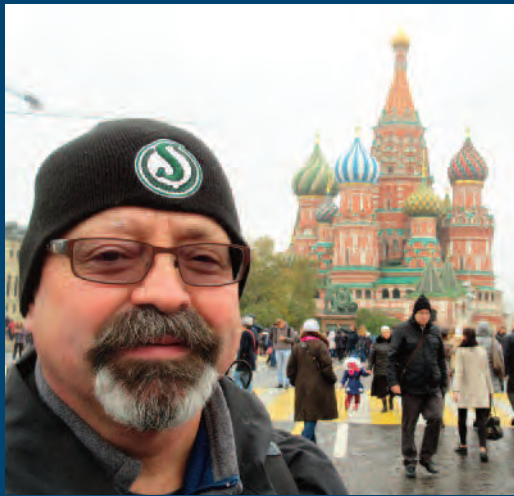
4. It doesn't look right.

Your water is discoloured, which is caused by the presence of iron and/or manganese. These are not detrimental to your health, but if iron levels are high, you may experience red, brown or yellow staining of laundry, dishes and fixtures. Manganese acts similarly, but causes a brown-black stain. Your water may have an offensive taste and odour and your water system piping and fixtures can get clogged.

5. You are worried about lead.

You notice that plumbing pipes are corroded or show signs of mineral and lead buildup. Many older homes used lead pipes in their plumbing systems. Even with copper pipes, until the late 1980s lead soldering was often used to join the copper pipes.

Member Profile



This month *The Professional Edge* chats with Rick Agrey, P.Eng., an electrical engineer working with SED Systems in Saskatoon.

Tell us about your personal and professional background.

I was raised on a farm near the little town of Parkside. I attended elementary school there and went to high school in Shellbrook. After high school, I went to the University of Saskatchewan and obtained an education degree. I taught science, math and phys.ed. in high school for six years until I went back to get my engineering degree in 1986.

What inspired you to go back to university?

I was always interested in electronics. My uncle, an old Second World War veteran, enjoyed repairing old tube radios. I enjoyed visiting his place to watch him work and that translated into a lifelong hobby. I started with tinkering with small pieces of electronics at home. As the hobby started to consume more and more of my time, I decided to do it full-time instead of in parallel with the rest of my life. So my wife and I packed up and moved back to Saskatoon.

How did your wife feel about it?

She was very supportive. She continued working. We started a family after graduation so our kids grew up knowing Saskatoon as home.

What was your biggest challenge in college?

I didn't really have any – at least not the second time. One of the things that high school students struggle with is getting a grasp on the math and science needed in engineering classes. I had been teaching those classes for six years so I was very comfortable with that. We were also fortunate financially because not only was my wife continuing to bring in an income but I also managed to get good summer jobs in the industry.

What was your first job after college?

This one – or this place anyway. SED hired me the spring I was to graduate and I've worked here ever since.

What do you do there?

I've done a wide range of things, primarily in the satellite communication industry. I have mainly worked on designing and building satellite ground and uplink stations. I have also overseen the creation of and tested software for satellite usage planning.

What do you feel was your single greatest accomplishment as an engineer?

We've done the complete ground system work for Sirius XM satellite radio. From their studios, they plug an audio wire into the equipment we provided that sends their signals up to the satellites that then sends signals to cars and radios all over North America. It is demanding work because they are continually looking for upgrades to their software to provide a better experience for radio listeners.

What are your interests outside of work?

Sports – fastball and soccer mainly. My wife and I are Rider fans so we go to as many games as possible. We also have season tickets to the Saskatoon Rush lacrosse team.

Do you do any volunteer work?

I'm a type 1 diabetic so I volunteer for Diabetes Canada for their fundraising drives whenever I can. When my kids were younger, I was heavily involved in our local community association and soccer club.

What is your favourite vacation spot?

On the job, I get to travel quite a bit around the world. Most of SED's work is outside of Canada and North America. Out of the places I've visited through work, my favourite is Australia – mainly because it's so much like Canada!

Outside of work, my wife and I enjoy travelling to folk music festivals across Western Canada. Among those, the Winnipeg Folk Festival is the one that stands out in my mind.

What book you are reading now?

The genre I enjoy is fantasy and I'm currently reading *Sage of Shadowdale* by Ed Greenwood. He's one of the original creators of the Forgotten Realms game world used in the *Dungeons and Dragons* role-playing game so he has an in-depth knowledge of the lore of fantasy worlds.

If you could have any super-power, what would it be and why?

I suppose, like any good engineer, I would wish for super-intellect so that I could solve problems instantly.

Who has had the greatest influence on your life and career?

In university, I had a couple of great professors, Jerry Huff and Roy Ludwig. They were influential on paths that I took in my career. They were pretty laid back. They allowed their students to delve into solving



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DEADLINE: March 1, 2018

Application form and complete list of criteria at:
www.engineerscanada.ca/awards-and-honours/scholarship-program

Building on **ENGINEERING*** knowledge

*The term ENGINEERING is an official mark owned by Engineers Canada.

problems on their own. They didn't solve the problem for you, just stepped in to help if you needed it.

For my life in general, of course I would say my parents. Neither of them had finished high school. My dad farmed a small farm. They placed a high value on education and insisted that all their kids complete high school and go on to post-secondary.

And I also need to recognize the tremendous influence of my wife for her support when I went back to school and throughout my engineering career.

Professional Development Profile



Name:

Dave Rezansoff, P.Geo., MBA, PMP, EMS (LA)

About Me:

Our family has a cabin on Last Mountain Lake, northwest of Regina. In recent years, high lake levels and wind-generated waves resulted in shoreline erosion and slope failures at several locations including near our cabin. Fortunately, over the course of four years, our worries became a realistic and achievable plan that resulted in a successful small shoreline restoration project.

Job Responsibilities:

I am the manager, compliance audit with the Ministry of Environment – Environmental Protection Branch, and work out of the Saskatoon office. Our team plans and conducts compliance audits on those who:

- have been issued a permit, approval or authorization pursuant to any Act or regulation administered by the Ministry of Environment;

- engage in an activity governed by an environmental protection plan (EPP); or
- are required to comply with the Saskatchewan Environmental Code as enabled by any Act administered by the Ministry of Environment.

Professional Development Activities:

Practice – I plan and deliver numerous compliance audits throughout the province each year, and directly oversee the work of other professional and in-training compliance auditors.

Formal – I attend courses and seminars related to environmental auditing, for compliance and management systems assessments.

Informal – I have attended the APEGS Professional Development Days and the Investigation and Discipline workshop. I have attended seminars on legislation interpretation and technical areas related including dyke and dam safety inspection and stack sampling.

Participation – I have served on both the APEGS Discipline Committee and Environment Committee. I have participated on ministry committees for occupational health and safety and risk.

Presentation – I plan and deliver training to staff and pool auditors, and internal and external presentations on compliance audit planning, delivery, follow-up and closure.

Describe how your development activities help increase your knowledge and competency at your job:

My ongoing development activities directly support my knowledge and competencies as an active auditor and a section manager with the ministry. This includes being able to identify and appropriately interpret environmental monitoring and operational performance information to assess compliance, as well as conducting efficient and effective field inspections and assessing information to identify potential issues with containment structures and slope stability. My APEGS CPD activities also support my designation as a certified Lead Auditor.

CORRECTION NOTICE:

In the July/August edition of Professional Development Profile, Sherri Dodge, M.A., P.Eng. was erroneously listed as having P.Geo. designation.



30 by 30 Task Group Report



Tara Zrymiak, P.Eng., FEC (left) and Margaret-Anne Hodges, P.Eng., FEC (right) host Dr. Menzer Pehlivan, P.E. (centre) at the Kramer IMAX Theatre.

Welcome Back, Dr. Pehlivan!

APEGS is very fortunate to have established strong working partnerships with STEM (science, technology engineering and math) organizations like the Saskatchewan Science Centre and the Children's Discovery Museum in Saskatoon. This year our relationship with the Saskatchewan Science Centre resulted in extending APEGS's contact with the McGillivray Freeman IMAX film producers and DiscoverE through *Dream Big* and meeting the featured engineer Dr. Menzer, P.E. Pehlivan is a geotechnical engineer with a focus on earthquake engineering.

Pehlivan joined APEGS for the 2017 Annual Meeting and gave a presentation on Women in the Profession. Her presentation reminded us that the popular public perception of engineers is based on stereotypes. She makes the case that math and science are compatible with creative and artistic thought.

In the film, Pehlivan relates that her early-childhood ambition was to be an actress. It took a devastating earthquake in her homeland of Turkey to inspire her to pursue engineering because in a professional capacity she was able to help people survive natural disasters.

Pehlivan knows first-hand what it is like to be told by a teacher that "women don't become engineers." Fortunately, she ignored that advice. Women want to help their family and community and sometimes to do so means practising engineering.

Pehlivan is returning to Saskatchewan for the Fall Professional Development Days and to help APEGS host the next Girls' Night Out event, aimed at high school students, at the Saskatchewan Science Centre on Monday, October 16.

Why is it important that Dr. Pehlivan come to Saskatchewan?

Because Pehlivan is an inspiring role model. Her story will resonate with young women who are deciding how to keep their options open as they think about their future careers. She encourages women to believe in themselves and their ability and encourages their parents to believe in their children.

Girls have so many career opportunities. Role models like Pehlivan can help, demonstrating that engineering and geoscience are great career options. Pehlivan is also happy to break stereotypes, even if that means wearing a dress and heels. Pehlivan knows that girls respond to positive images of women and make the connection that being female is not a barrier to pursuing engineering, solving problem and helping people.

So why do we need men and women engineers to be role models?

We all need positive role models! Sixty per cent of all engineers have a close family member or friend who is an engineer. Anecdotally, many women engineers have a father, brother, uncle or cousin who is an engineer.





Engineering and Geoscience Bursaries, Scholarships and Member Grants Available

The Association of Professional Engineers and Geoscientists of Saskatchewan (APEGS) is pleased to announce 14 annual bursaries and scholarships to be awarded at the University of Saskatchewan and the University of Regina and two member grants to be awarded by APEGS.

Entrance Bursaries

These bursaries are aimed at encouraging and assisting high school graduates entering the study of engineering or geoscience, particularly Indigenous students.

Two bursaries of \$3,625 (one for each university) to be applied towards first-year tuition in any field of engineering for a self-identified Indigenous student.

Two bursaries of \$2,750 (one for each university) to be applied towards first-year tuition in any field of geoscience for a self-identified Indigenous student.

Two bursaries of \$3,625 (one for each university) to be applied towards first-year tuition in any field of engineering for a student of any background.

Undergraduate Scholarships

These academic performance and community participation-based scholarships are aimed at recognizing leadership and volunteerism among students currently enrolled in engineering or geoscience.

Six scholarships of \$1,875 (three for each university) for current students of any field of engineering.

Two scholarships of \$1,875 (one for each university) for current students of any field of geoscience.

Graduate Students

These merit-based grants are aimed at encouraging existing APEGS members to further their education.

Up to six grants of \$7,500 each for current APEGS members returning for post-graduate studies (either university) in fields of engineering, geosciences or an MBA program.

For more information, refer to the APEGS website: <http://www.apegs.ca/Portal/Pages/Scholarships-Bursaries-Grants>



2018 Membership and Licence Fees

Due on or before December 31, 2017

Renewal notices will be mailed soon!

Renewal notices will be sent in mid-November and it is the responsibility of members and the official representative for a Certificate of Authorization to make sure contact information is up to date, including your email address.

If you don't receive your dues notice by December 1, 2017, contact APEGS. Fees are due on or before December 31, 2017 regardless of problems with delivery.

Check your contact information in your On-Line Profile

To check your contact information, log into your On-Line Profile by clicking "Login" in the top right corner on the APEGS home page. If you have never used the system before, click on "New password / Forgot password" and follow the instructions.

Other things that can be done in your On-Line Profile are: all other fee payments, entering Continuing Professional Development (CPD) credits, renewing Permission to Consult, managing your email/mail subscriptions and volunteering for APEGS.

What happens if I don't renew?

You would no longer have the privilege of practising within Saskatchewan or on properties or facilities located in Saskatchewan. Use of title in Saskatchewan is also a privilege of membership.

Members who do not retain their membership in APEGS and/or another Canadian association/ordre will lose coverage under the National Secondary Professional Liability Insurance Program. Also, failure to maintain your membership will result in ineligibility for benefits under the group life insurance program offered through Manulife and Engineers Canada if you have subscribed to this insurance.

What if I am not working in Saskatchewan?

Members who are retired or not working (at anything) in Saskatchewan can retain membership and may be eligible for a waiver of the fees for the annual licence. More information can be obtained from the documentation accompanying the dues notice or from the APEGS office.

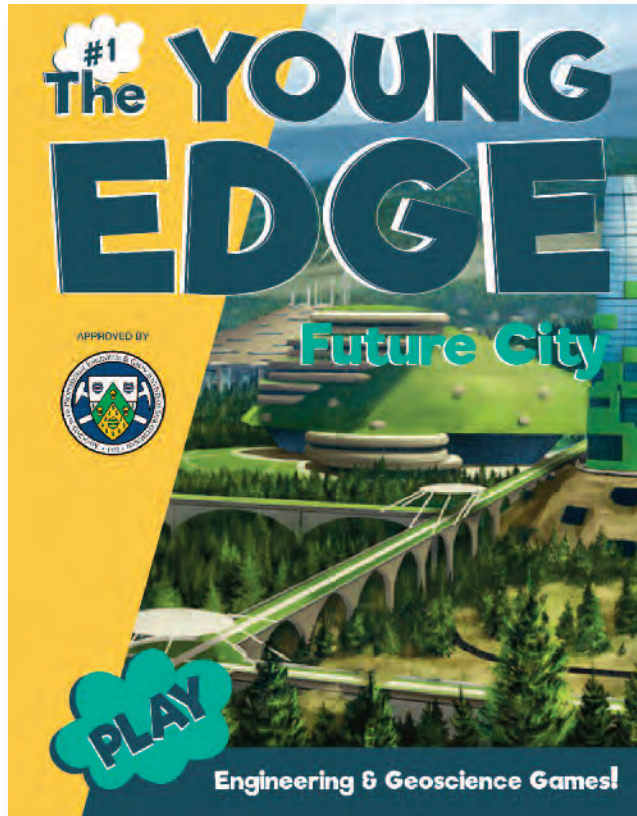
What if my membership ceases and I need to reinstate?

Memberships that have ceased are subject to a 15 per cent fee to reinstate in the same calendar year. Members who notify the APEGS office in writing of their intent to resign their membership on or before January 31, 2018 may reinstate their membership and licence during the calendar year without the payment of a reinstatement or application fee. The late payment penalty for the holder of a Certificate of Authorization is 15 per cent of the annual fee.

For reinstatement procedures for subsequent calendar years, see the APEGS website under Apply, Reinstatement.

Eligibility for life membership

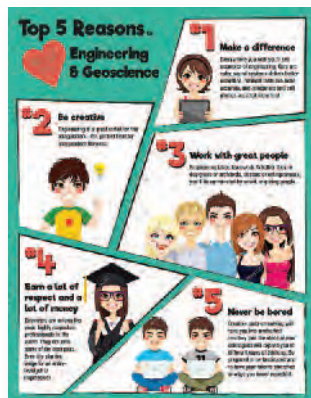
Members who are 65 years of age and retired are eligible to apply for life membership. An application will come with your renewal notice in mid-November.



Introducing

APEGAS is pleased to announce an exciting new pilot project to promote engineering and geoscience careers to young people.

Two editions of the magazine will be produced with appropriate content for different age groups – grades 6-8 and grades 10-12.



We need your help!

APEGAS would like to invite our members to help us make this project as successful as possible.

We need ideas for a name! “Young Edge” is only the working title. We are looking for suggestions for a name that will be catchy and exciting for young people and that conveys the sense of engineering and geoscience or science in general. (The title does not need to include the word “Edge”).

Send your suggestions for names to Sheena August:
saugust@apegas.ca





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Call for APEGS Council Nominations

Nominating Committee

The Nominating Committee is soliciting names for the council positions described below. You may contact staff support to the Nominating Committee, Shawna Argue, at sargue@apegs.ca to propose names of potential candidates. Shawna may also be reached through the APEGS office in Regina by phone at 306-525-9547 (toll free 1-800-500-9547 North America), or facsimile 306-525-0851.

The Bylaws require the Nominating Committee to nominate, whenever possible, the person holding the office of President-Elect for President, and one person for the position of President-Elect (typically the person holding the office of Vice President). Stormy Holmes, P.Eng., FEC is the current President-Elect and Terry Fonstad, P.Eng., FEC is the current Vice President. The Nominating Committee is also required to nominate, whenever possible, at least two persons for Vice President and at least two persons for each vacancy on the Council.

Submissions of Nominations

Any five members may nominate over their signatures an eligible nominee for any elective office, except that of President. Such nominations shall be in the hands of the Registrar at least forty-five days before the election is to take place. To meet this requirement, the nominations must be in the APEGS office no later than 5 p.m., Thursday, March 15, 2018, as the election will take place when ballots are counted on Monday April 30, 2018, the “polling day”.

2018 Vacancies & Terms of Office

Officers

- President-Elect – one-year term
- Vice President – one-year term

Group and Electoral District Councillors – to serve a three-year term

- Group II (Mechanical and Industrial)
- Group V (Agriculture and Forestry)
- Members-in-Training
- South-East District
- Geoscience South District

Terms of Office

Only members in good standing are eligible for nomination.

A person elected to Council may only hold office while a resident of Saskatchewan.

A person nominated for President-Elect must have served at least one full year (i.e. from the close of business at one Annual Meeting to the close of business at the next Annual Meeting) as a member of APEGS Council prior to the date on which they would assume office as President-Elect.

A person nominated as a representative of an electoral group must be classified with the association in that electoral group. The Councillor representing Members-in-Training can complete the term of office after obtaining his or her P.Eng., or P.Geo. status.

<http://www.apegs.ca/Portal/Pages/council-elections>

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- Engaging Your Team Through Change • Global Potash Deposits
- Leadership, Governance and Ethics • Innovations in Water Treatment
- 7½ Things to Save Lives • Growing our Leadership & Industry • Boosting Energy
- Managing your Career • 5 Mistakes We Make When Negotiating

Registration through Eventbrite is now open

<http://wimwinsk.com/event/mine-your-potential-2017/>

Registration \$250, Students \$100

For more information, visit our website! www.wimwinsk.com

WIM/WiN-SK's 5th Mine Your Potential conference provides an excellent personal and professional development opportunity for people involved or interested in the minerals, mining, nuclear, and radiation industries.

Keynote Speaker:

**Honourable A. Anne McLellan,
P.C., O.C., A.O.E.**

Past Minister of Natural Resources and Board of Director member for Agrium and Cameco.



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TD Insurance Meloche Monnex, provider of the home and car insurance program endorsed by Engineers Canada, is proud to be associated with the Engineers Canada Scholarship Program by offering three scholarships for 2018.

Three TD Insurance Meloche Monnex Scholarships of \$7,500 each

Each scholarship will assist the candidate to pursue studies or research in a field other than engineering. The discipline should favour the acquisition of knowledge which enhances performance in the engineering profession. Candidates must be accepted or registered no later than September 2018, in a faculty other than engineering.

Application deadline: March 1st, 2018

Application forms are available at
engineerscanada.ca/awards-and-honours/scholarship-program
or by contacting the Engineers Canada Scholarship Program at
awards@engineerscanada.ca



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News Beyond Our Borders



wikimedia.org

As Sea Levels Rise, Roman Concrete May Offer Lessons

Engineering360.com - Modern marine concrete structures crumble within decades but 2,000-year-old Roman piers and breakwaters endure and many are stronger than when they were first constructed.

University of Utah geologist Marie Jackson studied the minerals and microscale structures and found that sea water filtering through the concrete leads to the growth of interlocking minerals that lend the concrete added cohesion.

Romans made concrete by mixing volcanic ash with lime and sea water to make a mortar. They then incorporated into that mortar chunks of volcanic rock, the “aggregate” in the concrete.

Modern Portland cement concrete also uses rock aggregate, but with a difference: the sand and gravel particles are intended to be inert. Any reaction with the cement paste could form gels that expand and crack the concrete.

The team concluded that when sea water percolated through Roman concrete in breakwaters and piers, it dissolved components of the volcanic ash and allowed new minerals to grow from the highly alkaline leached fluids.

The crystals have platy shapes that reinforce the cementing matrix. The interlocking plates increase the concrete’s resistance to brittle fracture.

Given the durability advantages of Roman concrete, why isn’t it used more often, particularly since manufacturing of Portland cement produces substantial carbon dioxide emissions?

“The recipe was completely lost,” Jackson says. She has studied ancient Roman texts, but hasn’t yet uncovered the precise methods for mixing the marine mortar, to fully recreate the concrete.



http://bcenr.ca/ucis.ca

Updates to Dam Safety Review Guidelines Address Engineer of Record

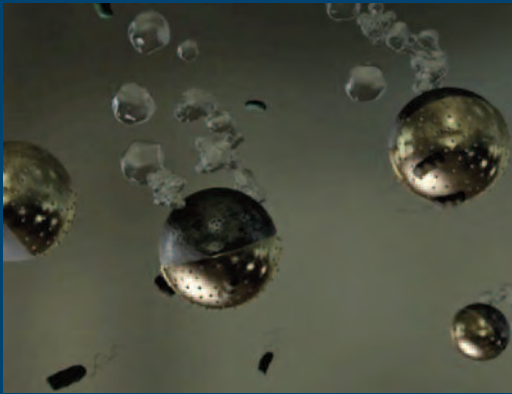
APEGBC - APEGBC recently updated its professional practice guidelines for legislated dam safety reviews. The latest version of the Professional Practice Guidelines - Legislated Dam Safety Reviews in BC, version 3.0, is now available on the association’s website.

The guidelines provide the basis for an appropriate standard of care in professional practice when carrying out dam safety reviews. They provide guidance on the specific aspects of dam safety reviews relevant to the governing legislation, Dam Safety Regulation 40/2016, depending upon the purpose of the dam involved.

This latest version of the guidelines reflects recommendations made by the chief inspector of mines and the auditor general in their reports following the Mount Polley dam breach, that there be clarification of the term “Engineer of Record.” A section providing more context on Engineer of Record responsibilities has now been included in the Legislated Dam Safety Reviews in BC guidelines. Additionally, some language in the guidelines has been updated to reflect recent changes to the BC Health, Safety and Reclamation Code and the Dam Safety Regulation.

The latest version of the Professional Practice Guidelines - Legislated Dam Safety Reviews in BC is available at apeg.bc.ca/guidelines. Questions regarding the updates to the guidelines can be directed to Lindsay Steele, P.Geo., Associate Director of Professional Practice at lsteel@apeg.bc.ca.

Tech Corner



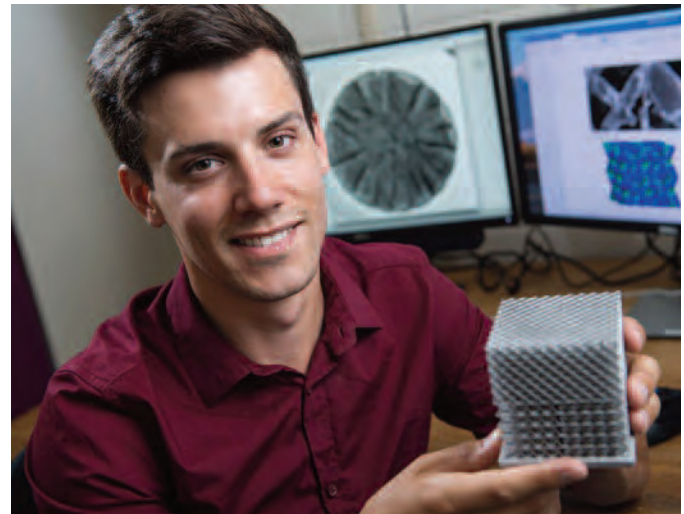
phys.org

Microbots trap and kill waterborne bacteria

Engineering360.com - When waterborne pathogens prove resistant to conventional disinfectants or when use of chemical agents is not desirable, send out self-propelled microbots decorated with silver nanoparticles.

Researchers engineered Janus, or two-faced, spherical particles to remove bacteria from water. One face is made with magnesium, which reacts with water to produce hydrogen bubbles and propel the micromotors. The other face is made out of alternating iron and gold layers topped by silver nanoparticles. Bacteria stick to the gold and are deactivated by the silver nanoparticles.

Lab testing showed that the particles can motor around in water for 15 to 20 minutes before the magnesium is spent. More than 80 per cent of *Escherichia coli* in water spiked with a high concentration of the bacteria was trapped. Because of the iron's magnetic properties, the microbots are easily removed with a magnet, without leaving any waste behind in the water. Tiny, self-propelled robots trap bacteria and could help make water safer to drink.



mein-elektroauto.com

Factory of the future: N.B. researcher to study 3D-printing powered by thought

Sudbury.com - New Brunswick researchers are plotting what they call the "factories of the future" by developing 3D-printing technologies they said could pave the way for the next industrial revolution.

Mechanical engineer Ed Cyr is studying the applications of artificial intelligence in manufacturing 3D-printed materials as part of a \$1.25-million innovation program from the McCain Foundation announced at the University of New Brunswick in Fredericton.

Cyr intends to take the advantages of 3-D printing technology to the next level by developing new behaviours that cannot be found in conventional materials.

For example, he said he is studying a printed aluminum alloy that, when put under certain types of stress, increases in strength far more than a typical sheet metal.

Later in his research, Cyr said he wants to "push the boundaries" of manufacturing by investigating the possibility of 3D-printing powered by thought.

"For a human to sit down and come up with the optimal design, we would have to come up with thousands and thousands and that would be incredibly time consuming," said Cyr. "The beauty of a computer is it has the ability to go through those thousands and thousands of designs. It can actually model a total design space and tell us which one is the best and it can even come up with things we might not even think of."

It may seem like the stuff of science fiction, Cyr acknowledged, but he said artificial intelligence is already testing the limits of what we thought possible.

For example, Cyr said researchers in Europe have developed 3D-printing technology for a "bridge (that) could build and design itself." According to Cyr, the machine scanned the distance the bridge needed to cross, simulated its structure and then printed it.

Call for APEGS Award Nominations

The Awards Committee is seeking nominations for the APEGS Awards as well as other provincial and national awards such as the Saskatchewan Order of Merit, the Order of Canada, the Canadian Engineers' Awards (Engineers Canada) and the Canadian Professional Geoscientist Award (Geoscientists Canada).

If you know of a Professional Engineer or Professional Geoscientist who should be considered for an award, or an exceptional engineering or geoscience project that should receive an award, the committee would like you to nominate that member or project. There are seven APEGS awards: the Exceptional Engineering/Geoscience Project Award, the Environmental Excellence Award, the Friend of the Professions Service Award, the Promising Member Award, the McCannel Award, the Brian Eckel Distinguished Service Award, and the Outstanding Achievement Award. Criteria for each of the awards are contained in the nomination form that appears on the next page.

In addition to the APEGS Awards, the Awards Committee nominates APEGS members for awards presented by both Engineers Canada and Geoscientists Canada. Nominations for awards must be received by November 30 to provide time for the Awards Committee to review and consider the nominations for the annual APEGS Awards and to prepare nomination packages for provincial and national awards. The Awards Committee will develop and maintain a list of nominees for consideration for the various awards.

Nomination form on following page.

Please send nominations to:
APEGS Awards Committee
300 - 4581 Parliament Avenue
Regina SK S4W 0G3
Fax: (306) 525-0851
Email: apegs@apegs.ca



Nominations for APEGS Awards

Do you know an individual or a group who should be considered for an award?

I would like to nominate:

In the following category:

Exceptional Engineering/Geoscience Project Award

Accomplishments in Engineering/Geoscience (100%). The project team must be made up predominantly of Saskatchewan engineers and/or geoscientists. The project may be located inside or outside of Saskatchewan. The award will be granted when the efforts of an individual or team of engineers/geoscientists is deemed to be of great significance.

Environmental Excellence Award *(all professional members of APEGS are eligible)*

Environmental awareness, preservation, protection and reclamation through education, leadership and/or involvement (25%). Enhancement of quality of life by improvement of the physical or social environment through engineering, geoscience or other works (10%). A real extent of environmental protection or preservation as a result of the efforts (50%). Prevention of potential environmental impacts vs. correction/remediation of existing impacts (15%). This award is intended to have broad scope and be open to a wide range of projects, achievements, initiatives and activities contributing to the protection and preservation of the environment.

Friend of the Professions Service Award *(available to anyone who is not a member of APEGS)*

Recognizes contributions by an individual or a group in the support and promotion of the professions (100%). Examples of activities include: documentation of the history of the professions; comprehensive media coverage of an outstanding engineering or geoscience achievement; long-time service on an APEGS committee or other form of contribution to the success of activities promoting the professions to the public.

Promising Member Award *(available to any member who has held P.Eng./P.Geo. for less than 5 years)*

Accomplishments in Engineering/Geoscience (50%). Service to the professions in public education and/or active participation in engineering/geoscience associations, societies, institutes (25%). Service to community (25%).

McCannel Award

Accomplishments in Engineering/Geoscience (20%). Service to the professions in public education and/or active participation in engineering/geoscience associations, societies, institutes (70%). Service to community (10%).

Brian Eckel Distinguished Service Award

Accomplishments in Engineering/Geoscience (35%). Service to the professions in public education and/or active participation in engineering/geoscience associations, societies, institutes (35%). Service to community (30%).

Outstanding Achievement Award

Accomplishments in Engineering/Geoscience (70%). Service to the professions in public education and/or active participation in engineering/geoscience associations, societies, institutes (20%). Service to community (10%).

I am nominating this person / project because (25 words or less):

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Other references (professional and community service related) to contact include:

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<http://www.apegs.ca/Portal/Pages/travel>

News From The Field



UNIVERSITIES & RESEARCH

U of S Space Design Team asteroid mining

CBC – This summer, members of the University of Saskatchewan’s Space Design Team went soaring through the air in a jet to test out their latest project.

On July 27, the team got a chance to ride in the National Research Council’s Falcon 20 jet, which can temporarily suspend gravity by flying into the stratosphere and then plunging down.

It wasn’t all fun and games. The team won a seat on the plane with their STARFOX project, (Spinning Terrestrial Analog Regolith Filtering Operation eXperiment) a system designed to be used for asteroid mining in the future.

While that may sound like a simple task, it gets considerably more complicated in zero gravity. While sifting rocks works easily with Earth’s gravity, in space, small rocks don’t fall through the holes.

So the team designed a spinning, mesh-covered cone — sort of like a tiny tornado — that sorts out the rocks. While the experiment wasn’t flawless, it did bring back some positive results.

CLS meets CSI: Synchrotron looks to improve forensics

Global Saskatoon - New research taking place at the Canadian Light Source (CLS) synchrotron is looking at ways to improve forensic investigations.

Not only can a person’s biological sex, age, height and health history be determined by examining bones, but DNA in bones can also confirm a person’s identity.

Forensic anthropologists help law enforcement when bones are discovered at a crime scene.

Typically when skeletal remains are discovered, investigators extract DNA from larger bones like a femur or tibia but researchers at the U of S are using the Canadian Light Source to challenge that theory, looking into which bones have the most DNA.

Research has determined smaller bones like fingers, ankles and the kneecap have higher DNA density compared to larger bones, but why?

Using micro-CT scanning and 3D imaging technology at the CLS, the researchers have found there are microscopic amounts of soft tissue remnants that are causing higher DNA yields.

The team hopes these findings will help law enforcement with forensic analysis in the future.

U of S researchers and ethanol research

Saskatoon StarPhoenix - U of S researchers have developed a new way to separate water from ethanol, the key component in alcoholic beverages and biofuel, using starch-based materials such as corn.

The method could reduce costs because it doesn’t involve using additional energy to isolate the ethanol.

In traditional distillation methods, fermented plants create a mixture of water and ethanol which is then heated to separate out the ethanol. However, some water remains.

U of S researchers solved this problem by using non-toxic starch-based materials that do not require energy to remove water. Published in *ACS Sustainable Chemistry & Engineering* in 2016 and 2017, the results show the new technology is 40 times more effective than materials previously studied and achieves an efficiency comparable to traditional distillation.

The materials act like selective sponges and remove water better than cellulose-based ones.

When immersed in a mixture of water and ethanol, the new materials suck up 80 times more water than ethanol.

The researchers hope to commercialize their starch-based materials in five years.

As well, the chemical researchers have been collaborating with the U of S College of Engineering to test these starch-based materials for use in a new class of air conditioning systems that remove moisture and humidity more efficiently.

Hello, University of Saskatchewan. This is NASA calling



CBC - A seven-member research group from the U of S was at the NASA Armstrong Flight Research Centre in Palmdale, California this summer.

Its mission? To help — alongside the Canadian Space Agency, York University and a private company, ABB — test the prototype of a satellite device that could one day be launched into space to measure the presence of water vapours in the Earth's upper atmosphere.

Water vapours are a key measure of climate change since they both hasten the warming of the atmosphere and serve as an indicator of man-made greenhouse gases such as CO₂.

The prototype is about as big as a bedside table and is bolted onto the base of a NASA plane as the aircraft conducts two flights at high altitudes.

The first flight will travel over parts of California and Nevada. The second will head north near Canadian airspace, just south of Vancouver Island.

Putting female eng. students in separate dorms

CTV News - Despite decades of campaigns to get more women into engineering, female engineers still face a world where they're forced to face questions about whether they fit in.

Gender equality advocates argue that, in fact, women are just as good at science, technology, engineering or math (STEM). They simply face stereotypes that keep them from choosing it. They point to research like a Statistics Canada

study that looked at highly respected Programme for International Student Assessment scores and found that only 23 per cent of Canadian females with high scores in math at age 15 chose STEM careers, compared to 46 per cent of high-scoring males.

Whatever the explanation, the number of women in Canadian engineering programs has barely budged in the past decade and a half. Figures from Engineers Canada show that undergraduate engineering programs were 20.3 per cent female in 2000. Fifteen years later, in 2015, the figure had dropped slightly, to 20.1 per cent.

Universities are asking what more they can do.

One new approach that's grabbing attention online is new Women in Engineering Living-Learning Community (LLC) launching this fall at the University of Waterloo. About 50 of the women starting Waterloo engineering will live together in this optional women-only residence, which is made up of clusters of females inside a mixed-gender building.

The idea is to create an environment where women can support each other with everything from coding skills they might have missed in high school to dealing with sexist remarks.

The women will be supported by paid older students called "peer leaders," who will run special activities designed to prepare them for the sexism they may face in the working world. They will, of course, take the same classes as male students.

Not everyone likes the idea. Many people have posted critical comments about the LLC on Waterloo's Reddit page, though few seem willing to discuss it publicly, citing fear of repercussions from classmates or employers.

But Waterloo Associate Dean of Outreach Mary Wells, who came up with the program, says it's worth a try because decades of outreach programs haven't closed the gap. After all, women are still outnumbered in Waterloo's lecture halls by about two to one and even more so in programs such as computer engineering, where only about one in six are female.

URANIUM AND NUCLEAR

Geo Survey explores eastern Athabasca Basin

Saskatoon StarPhoenix - Sprawling across northern Saskatchewan and Alberta, the Athabasca Basin is home to some of the world's richest uranium deposits, which were discovered in the 1940s and mined since the late 1960s.

What is less clear, however — and what Geological Survey of Canada geophysicist Vicki Tschirhart hoped to discover

this summer — is the western part of the basin’s underlying geology and the source of its high-grade deposits.

“Such little was known about it in comparison to the east,” Tschirhart said from a mining camp near Hook Lake owned by Purepoint Uranium Group Inc., one of many firms assisting the researchers this summer.

All of Saskatchewan’s operating uranium mines are concentrated in the eastern Athabasca Basin, near Wollaston Lake. Tschirhart said deposits in the Hook Lake region were not discovered until 2012.

Besides taking over Natural Resources Canada’s Instagram account with the aim of giving people a taste of northern geology, she plans to study previously-extracted core samples and take hundreds of new measurements.

Tschirhart said the work is non-invasive and involves scientists from many disciplines, including those specializing in minerals and sediments.

Her own work involves “magnetic susceptibility” — examining core samples and the results of a recent airborne survey to extrapolate as much as possible about the local geology.

Knowledge of the basin’s eastern reaches is extremely limited, but there are two competing theories on the source of uranium in the west: either it leached through the sandstone cover or climbed up from much deeper in the earth’s core.

While the work, which Tschirhart said will likely be presented in a report this fall, will benefit exploration companies looking for uranium, it’s also intended to flesh out scientists’ understanding of the Athabasca Basin.

ENVIRONMENT

Ranchers complain of mine’s effect on water supply

Western Producer - Several cattle producers along the Wood River in south-central Saskatchewan have to move about 1,000 head to different pastures after water quality in the river declined unexpectedly.

The issue arose after Saskatchewan Mining and Minerals, based at Chaplin, diverted water from the river for its sodium sulphate operations.

As a result, oxygen levels in the river that about half a dozen producers use to water their cattle dropped unacceptably low, according to one of those affected.

One rancher said he knew something was wrong when he came across dozens of dead fish and an intense sewage smell.

Unable to get answers from the mining company or the province, he contacted the federal fisheries department. Environment Canada staff went to the site Aug. 3 to investigate and test the water.

The agency reported that the oxygen level was less than half of 1 per cent on the side the producers use for water but at an acceptable 11 per cent on the other side of the diversion weir.

According to the mine website, it uses a brining process to obtain sodium sulphate from Chaplin Lake. Its primary sources of fresh water are local spring runoff and precipitation. The secondary source is water from the Wood River that is moved through the diversion managed by Ducks Unlimited.

Cattle producers are out of luck for using river water for the rest of the summer. Only opening the dam at Thompson Lake to put water in the river would alleviate the problem, the rancher said, but officials aren’t likely to do that.

A provincial environmental protection officer also went to the site later in the summer.

INFRASTRUCTURE

Gardiner Dam celebrates 50 years



Global Saskatoon - It’s a massive project that was built 50 years ago and has been critical in Saskatchewan for fresh drinking water, flood mitigation and power.

In 1967, Gardiner Dam was officially opened after the idea was spawned in the dirty thirties. It would take another 25 years to nurture the vision and then 10 more years to build.

It was a historic piece of infrastructure back then, today and into tomorrow as the province’s population grows.

There is no doubt, standing on the spillway or watching as

a gate is opened for water to flow half a century later, that Gardiner Dam is still impressive.

It took nine years to build and its width at the base is 1.6 kilometres. Gardiner Dam is 5 kilometres in length and at the time cost \$120 million to build.

It's one of the largest earth-filled dams in the world by embankment volume. Along the spillway the drop down on the dam side is 44 feet and 24 feet down on the Lake Diefenbaker side.

The hydroelectric station located 1 kilometre downstream can power as many as 100,000 homes. The water that needs to come through the generators to get that much power is enough to fill an Olympic swimming pool in about eight seconds.

It is also one of only three sites that could trigger power restoration in the event of a province-wide blackout if outside power from other provinces wasn't an option.

The force of the flowing water from Lake Diefenbaker rotates three 84,000-horsepower turbines which drive generators to produce electricity.

Lake Diefenbaker, when full, holds 9.4 billion cubic metres of water and officials said it is a safe water supply to over 60 per cent of municipalities in the province.

Regina pavement gets anti-aging treatment



CBC Saskatchewan - Regina pavement is receiving something akin to a collagen injection.

The city is testing out a new way to preserve roads. It involves applying a product to the surface of roadways that will rejuvenate the flexibility lost as asphalt ages. It is also intended to seal the surface to prevent cracking and erosion.

The product being applied in the initial phase is an emulsion that is made up almost entirely of the “soft components” present in fresh asphalt.

“As a comparison, these softer components are like

collagen in our skin,” said Les Malawski, P.Eng., the city’s manager of research and innovation.

“As we age, the collagen level is going down. One therapy is to reinject this collagen back into the skin.”

The road treatment is similar, he said, in that it penetrates the top layer of asphalt, rejuvenating it.

As the process is about preservation, not repair, the roads selected are still in fairly good shape.

“This type of treatment only works when the road is still in fairly good condition and you have minor cracks,” said Norman Kyle, P.L. (Eng), the city’s director of roadways and transportation.

“When you have older pavement that’s very brittle and broken up, it’s not going to be as effective and you’re not going to get the same benefits as you will on a road like this.”

The city is putting \$350,000 toward the pilot project, which the city hopes will be offset by not having to repave roads as frequently.

Within the first couple of years, the city will be able to determine the effectiveness of the product and whether more money should be devoted to it, Kyle said.

About 20 locations, covering 260 000 square metres, have been chosen for the pilot project.

OIL AND GAS

SK oil drilling forecast increased

CTV Regina - Revenue from the August sale of oil and natural gas rights in Saskatchewan totalled \$8 million. The southeast region attracted the most interest, accounting for \$6 million of the revenue generated from the August sale.

Also in August, the Petroleum Services Association of Canada increased its drilling forecast for Saskatchewan from 1,940 to 2,794 wells.

“These figures, along with positive expectations by industry, suggest our oil and gas sector is regaining momentum after a prolonged period of transition,” said a spokesman from the Ministry of Energy and Resources.

The August sale, which was the third of the fiscal year, brings the current revenue tally to \$32 million. The next public offering of oil and natural gas rights in Saskatchewan held on October 3.

Husky Energy investing in CCS

Saskatoon StarPhoenix - Husky Energy Inc. is increasing its

investment in carbon capture and storage (CCS) technology, which it hopes will make its expanding heavy oil operations in Saskatchewan more environmentally friendly.

The Calgary-based company has been operating a tiny CCS plant developed by Inventys Inc., a clean energy company headquartered in Burnaby, BC at its Pikes Peak South operation northwest of Maidstone for six months. This summer it invested millions of dollars in the BC company with the aim of developing a much larger plant at the site.

“We are moving ahead with a 30-tonnes-per-day pilot project . . . We believe this technology has the potential to reduce the cost of carbon capture compared to existing technologies, and could turn Lloyd thermal production into a lower carbon source of energy, and make Alberta more environmentally friendly,” a Husky spokesperson said.

Carbon dioxide captured by the new project will be used alongside carbon dioxide recovered from other facilities for “enhanced oil recovery” operations in the region, she said. The process makes other types of oil wells more efficient, the spokesperson added.

The new plant at Pikes Peak South is expected to be commissioned in the fourth quarter of 2018. Inventys CEO Claude Letourneau said it will have the footprint of two flatbed trailers, cost about \$20 million and use the company’s second-generation CCS technology, which improves efficiency by capturing carbon dioxide in a solid material rather than a solvent.

The increased efficiency, Letourneau continued, is expected to lead to significant cost savings. The capital cost of existing CCS technology is between \$60 and \$90 per tonne, but Inventys is aiming to cut that to about \$30 per tonne — which the oil industry requires before it can start adopting CCS on a wide scale.

Husky given permission for repairs

Canadian Press - Husky Energy says it has been granted permission to repair and replace a section of pipeline that leaked 225 000 litres of crude oil in Saskatchewan just over a year ago.

With the pipeline out of commission, Husky has been relying on tanker trucks to transport crude the final leg to Lloydminster, Sask., until it is repaired and permission is granted by the government to resume operations.

The company said it plans to include more monitoring equipment that will measure ground movement, as well as add thicker and higher grades of steel pipe to the section of pipe that burst near the North Saskatchewan River.

The spill sent about 40 per cent of the leaked crude into the waterway, forcing communities downstream to shut off a main source of water for almost two months.

Husky has been criticized for its slow response to the spill.

The planned extra equipment for the section, including fibre optic cables to detect pipeline and ground movement, will help make it clear when a spill has happened.

Husky’s investigation determined the pipeline buckled because of ground movement. The company has said it accepts full responsibility and is using what it learned to improve operations.

ENERGY

Show local preference for renewables, says Brandt



Saskatoon StarPhoenix - The head of Saskatchewan’s largest privately held company wants the province’s electrical utility to favour local firms, including his, as it works to boost Saskatchewan’s reliance on alternative energy sources to 50 per cent from the current 25 per cent during the next 13 years.

Brandt Group of Companies president Shaun Semple said a “local preference” in SaskPower’s procurement process could support not just his firm’s plan to build a wind turbine factory in Saskatoon’s former Mitsubishi Hitachi Power Systems Canada factory, but an entire industry in the province.

Just over four months ago, Brandt bought the sprawling 58th Street East factory for an undisclosed price and unveiled plans to fill the vacant facility with up to 500 of its employees.

In addition to the turbine factory, the plant is expected to house elements of the company’s agricultural and custom manufacturing divisions as well as research and development facilities.

The Crown corporation’s procurement policy states its purchases must “obtain best value” for its money, ensure everyone is treated fairly, meet its operational requirements, comply with the province’s trade obligations, maintain “the highest ethical business standards” and support the development of Saskatchewan’s economy, including Aboriginal businesses.

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Calendar Of Events



saskedg.ca

APEGS Fall PD Days

October 16-17, 2017, Regina, SK
www.apegs.ca

Electrical Power & Energy Conference (EPEC) 2017

October 22, 2017, Saskatoon, SK
epec2017.ieee.ca

Exploration '17 - Integrating the Geosciences: The Challenge of Discovery

October 22, 2017, Toronto, ON
www.exploration17.com

IEEE Canada Women in Engineering Panel 2017

October 23, 2017, Saskatoon, SK
www.apegs.ca/Portal/Pages/event-details-7/33977

Advanced Project Management

October 26- 27, 2017, Vancouver, BC
www.egbc.ca/Events/Events/2017/17OCTA
PM

Mine Your Potential 2017 - WIM WiN

October 27, 2017, Saskatoon, SK
www.wimwinsk.com

Introduction to Business Writing

November 2, 2017, Vancouver, BC
www.egbc.ca/Events/Events/2017/17NOVITB

Gender Summit 11 – North America

November 06, 2017, Montreal, QC
www.gender-summit.eu/gs11-about

ACEC-SK - 2017 Awards of Distinction Reception

November 07, 2017, Saskatoon, SK
www.acec-sk.ca

Expert Witness Seminar

November 21, 2017, Vancouver, BC and Webinar
www.apeg.bc.ca/Events

Isolation Techniques in Piping Systems to Prevent Major Incident

November 22, 2017, Edmonton, AB
www.apega.ca/members/events/isolation-techniques-nov22

Introduction to Hydrogeology and Groundwater Management

November 23, Vancouver, BC
www.egbc.ca/Events/Events/2017/17NOVIHG

2018

Evaluation and Rehabilitation of Pavements

January 29, 2018, Vancouver, BC
www.egbc.ca/Events/Events/2018/18JANERP

Women in Leadership Webinar

February 7, 2018
www.egbc.ca/Events/Events/2018/18JANWIL

Resources for Future Generations

June 16-18, 2018, Vancouver, BC
rfg2018.org