

THE PROFESSIONAL



# EDGE

ISSUE 167

MARCH/APRIL 2017



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GEOSCIENCE

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## High Hopes for Helium

BY MARTIN CHARLTON COMMUNICATIONS



## Mother Nature's Tough Love

BY MARTIN CHARLTON COMMUNICATIONS



## A Tale of Tailings

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### CORRECTION NOTICE:

In Issue 166, "Profiles in Achievement" on page 9, the K+S fluid storage system was erroneously referred to as a "tailings storage" system in the title. The editorial staff of *The Professional Edge* extends our apologies to K+S for any embarrassment this error may have caused.

## President's Message



Leah McDonald, President Zrymiak, Tammy Roney by the USS Klondike in Whitehorse

We're all in this together – from welcoming geoscientists into the Association 20 years ago, to working with our sister regulators to optimize our service to the public across the country, to consulting with other self-regulating professions in our province in areas of common interest like continuing professional development. When we work together, everybody wins!

In March of 1997, APES/APEGS President Henry Feldkamp, P.Eng. said, “Professional engineers and geoscientists have joined forces to provide even more value-added services for a safe and prosperous quality of life for all,” and Highways and Transportation Minister Andy Renaud said, “The marriage of these two groups is a logical result of today’s increasingly complex society.”

Since then, APEGS has been proud to include several geoscientists on each council and to work together and share learnings between our closely connected professions. The way I see it, geoscience is the starting point for a lot of what engineers do because engineers use the information and data from geological study of the Earth as the basis for most of our applied science. Geoscientists may comprise less than 10 per cent of our membership but they are important contributors to our overall mandate.

You will see in the APEGS Annual Report each year summaries of the annual activity of a number of geoscience-based groups including Geoscientists Canada, the geology departments and geology student clubs at the U of R and the U of S and the Saskatchewan Geological Society (SGS). All of these groups make impressive contributions to the advancement of geoscience in the province. For example, over the past year the SGS has sponsored 13 technical



**President Zrymiak presenting Colton Vessey with the Walter Kupsch Award at the SGS AGM**

presentations on topics ranging from rethinking the cretaceous climate to modelling uranium deposits to the NASA mission to Pluto. They also sent a number of students on a field trip to Jasper/Hinton, held a golf tournament, published their popular geological calendar and put on what has been rated as the best open house in the country this year.

I was pleased to be invited to the annual SGS Awards Banquet recently, where their outgoing president, Ryan Morelli, P.Geol., gave an engaging address titled “Some Thoughts on the Link Between Geology and Art.” He first took us all on a pictorial tour with his family of the wonderful architecture and sculptures in Rome. He went on to discuss rock as a medium for art and as an inspiration for art of many forms: paintings of geological features (including Group of Seven depictions of the Gunnar Mine here in Saskatchewan), novels like *Journey to the Center of the Earth* by Jules Verne and even poetry such as “Volcanoes be in Sicily” by Emily Dickinson.

There are also many examples of movies with a geological basis, although sometimes the science in these is questionable to say the least. Ryan even found references to geology on the small screen. Any of you who have seen *The Big Bang Theory* will be aware of Sheldon Cooper’s claim that “Geology is the Kardashians of science.”

I have recently been on three trips representing APEGS. First I was in Fredericton for the Engineers Geoscientists New Brunswick AGM, where I heard about an intriguing trial being undertaken by NB Power to optimize power usage in the province by implementing a smart grid. I then travelled to Whitehorse for the Engineers Yukon AGM,

where they have initiated discussions with the government to consider adding geoscientists to their association. The spring meeting of the Engineers Canada board in Ottawa was very interesting with pending adjustments due to the CEO change and discussions about strategic planning and evolution of the accreditation process. The recurring themes throughout the three days of meetings were focus and transparency. I am looking forward to attending the Annual Meetings of APEGA and PEO in April as well.

As I head into the final few months of my term as APEGS President, this is my last message in *The Professional Edge*. To say that serving the Association in this role has been an honour and a privilege is a gross understatement, as it has been a tremendous growth experience for me personally as well. Participating in the board meetings of Engineers Canada and Geoscientists Canada, annual meetings of most of our sister associations (apologies to Newfoundland Labrador and Quebec) and PNWER summits has opened my eyes to the multitude of different ways and means that can be employed to achieve the same general needs. I hope that I was able to pass some of these learnings back to our own Association and members through my participation in Council, board and committee meetings as well as many other events.

I would like to thank all the members of Council and especially Executive Committee members Ernie Barber, Stormy Holmes, P.Eng., Margaret Anne Hodges, P.Eng., FEC and Bob McDonald, P.Eng., LL.B, FEC for their support and encouragement throughout the year. I would also like to thank all of the staff in the APEGS office – it’s a cliché, but it’s true that we couldn’t do it without them. I also want to thank my family for their support, specifically my daughter Alexandra for being my proofreader/editor and my mom Doreen for being my travelling companion.

**Last, I want to thank the membership for giving me the opportunity to serve you as President. I hope I was able to do justice to the trust you placed in me and I look forward to continuing to be involved in this great organization.**

# Twenty Years of Partnership

## Celebrating the Formation of APEGS



March 7, 1997 - Honourable John E.N. Wiebe Lieutenant Governor of Saskatchewan signs the proclamation of *The Engineering and Geoscience Professions Act*, attended by Heinrich Feldkamp, P.Eng., FEC (APES President 1996 – 1997) and Frances Haidl, P.Geo., FEC (Hon.), FGC (Act Amendment Committee)

**M**arch 7, 1997 was a landmark date in the evolution of the professions in Saskatchewan. That was the day that APES became APEGS as geoscientists were welcomed into the association under the newly-proclaimed *The Engineering and Geoscience Professions Act*.

Before that time, geoscientists were represented by a collection of more informal voluntary organizations such as the Saskatchewan Geological Society (SGS) or by registration as a Professional Engineer under the previous legislation. The coming together of the two professions was part of a growing trend in Canada and around the world to bring accountable self-regulation to geoscience.

Back in the 1990s, former APEGS Executive Director and Registrar Dennis Paddock, P.Eng., FEC, FCSSE, FCAE, FGC (Hon.) was a volunteer who helped coordinate the merger talks.

“Although the Bre-X scandal didn’t happen until the merger was complete, there had been a number of smaller scandals in other places that caused governments to become concerned about exploration speculation. Consequently we got signals behind the scenes from our partners in government that they wanted to see something happen to avoid something happening here,” Paddock says.

Saskatchewan was not the first to take this step. Alberta and BC had already brought geoscientists into their engineering associations and other provinces were lined up not far behind. Fran Haidl, P.Geo., FEC (Hon.), FGC, who co-chaired negotiations from the geoscience side, notes

that this was a key motivation for her peers at the time.

“It was clear that professional registration would soon be necessary for interprovincial mobility. But that wasn’t the only reason. It was obvious that this was a step that was needed to protect the public and that it just didn’t make sense to have two separate organizations,” she says.

Haidl notes that perhaps the greatest challenge in transitioning from a voluntary to a formal association was maintaining communication. To facilitate communication, in 1989 the SGS/CIM Professional Registration Committee, composed of geoscientists from industry, government and both universities, was formed.

Both Paddock and Haidl recall that the talks proceeded smoothly with only a few small points of contention that were easily resolved. The harmonious atmosphere of the discussions was further proof that the two professions were meant to be together.

That harmonious partnership has played out in the decades since, Paddock says.

“I think that, at first, some geoscientists might have been concerned that they would be overwhelmed and have little voice in the new association. On the contrary, geoscientists have proven to be important voices in the development of APEGS. They have held many posts on the executive and have been active members of many boards and committees,” he says.

### Today, 20 years on, it is difficult to imagine APEGS without geoscientists.

In this issue of *The Professional Edge*, we pay tribute to this major anniversary with an issue focused on geoscience-related stories.



1996 – 1997 APES Council



# High Hopes for Helium

BY MARTIN CHARLTON COMMUNICATIONS

**What do party balloons, MRI machines and rocket fuel have in common? Helium is a crucial ingredient for each.**

**T**here's growing optimism in Saskatchewan that exploration and production of the ultra light gas could increase here, even more than it has already. The province issued 59 helium leases in 2016; it didn't issue any the year before.

"The potential is here, definitely," said Melinda Yurkowski, P.Geo., who has studied the geology of the helium deposits in southwest Saskatchewan. Yurkowski is the Assistant Chief Geologist, Petroleum Geology Unit, with the Saskatchewan Geological Survey at the Saskatchewan Ministry of the Economy.

But helium has some maturing to do if it wants to catch up to the marquee performers in the Saskatchewan resource economy.

Oil, potash and uranium have long been highly sought after commodities. Helium is now considered a marketable product, though its future on the trading front is relatively unknown.

Explorers from across Canada and the United States, as well as the United Kingdom, have expressed interest in Saskatchewan's helium potential. With the world using approximately eight billion cubic feet of helium every year, there's a window of opportunity in which Saskatchewan can manoeuvre.

Whether helium is the next big star for the province's economy remains to be seen. Yurkowski sees that market gaining momentum.

"There's a lot more exploration now than there was five years ago but it's still in its infancy," she explained. "I can't really say where it's going to lead. It really depends on the quality of the deposits that the explorations are going to find."

Helium is found both in trace amounts as a byproduct of other gases (such as natural gas) and as a primary commodity. Saskatchewan's current helium wells, with concentrations between one and two per cent, are considered primary commodity wells.

Saskatchewan's known helium reserves are found beneath the southwestern part of the province where the gas is trapped in the Deadwood Formation, a 500-million-year-old sandstone unit resting on rocks of the ancient Precambrian shield 2,000 metres below the earth's surface. The helium is a by-product of the natural decay of uranium and thorium which is found in the Precambrian granitic rocks. As the helium is generated, it escapes the Precambrian through faults and fractures and slowly makes its way to the rocks that can trap the helium.





Photo courtesy Saskatchewan Geological Survey

### Helium facility near Mankota

Right now, production is from the Deadwood, but Yurkowski noted that the potential also exists for other formations in the lower part of the stratigraphic column to trap helium.

The exploration process is similar to that for oil and gas. A drilling rig is used to find the source and once it's found, the well is cased.

When it comes to producing helium, it needs to be separated from the other gases that are present within the well. Because helium has a lower boiling point than other gases, it is extracted by slowly lowering its temperature. As the temperature decreases, other gases are released from the solution. What remains is helium, though it has to be purified further if you want to develop a medical grade helium.

Weil Group Resources, a helium processing firm, last year revived a couple of dormant natural gas wells that were drilled in the 1950s and 1960s near Mankota, approximately 150 kilometres southeast of Swift Current. Inert gas was present in these wells and helium was found. The facility has the capacity to produce 40 million cubic feet of helium a year — a fraction of the estimated six billion cubic feet the world uses annually.

In addition to these two wells, a third producing well in Saskatchewan is found near Wilhelm – slightly north of Swift Current. Other wells have recently been drilled near Battle Creek near the Alberta border and Simmie, which is slightly southeast of Gull Lake.

Saskatchewan has been home to helium exploration as early as the 1950s. As some would call it, luck played a role in the original discovery of helium in Saskatchewan as geologists learned about the potential for helium while searching for oil and gas in the late 1950s and 1960s.

The discovery of the helium resulted in steady production in Saskatchewan from 1963 to 1977. However, when the price of helium dropped, well producers quietly shut the doors and walked away. Now, with the price of helium rising, these old wells have been rediscovered.

On its website, Helium One says, "the global helium market is expected to exceed \$6 billion in 2016. The price of bulk liquid helium has risen more than 100 per cent in the last 10 years."

Canada has the fifth- or sixth-largest helium resource in the world, behind the U.S., Qatar, Algeria, Russia and possibly Tanzania.

Of course, helium's most popular link is through party balloons and when inhaled allow a person's voice to reach much higher octaves. Because it's a lifting gas, it was sought after during World War I thanks to its ability to put blimps in flight.

But helium now serves many valuable uses in the science and technology industry. One of the big uses right now is for a cooling gas for magnetic resonance imaging machines. Because helium is a small molecule and not reactive, you can use it in the manufacturing of semiconductor chips and fibre optic cables, as well as for welding projects and in rocket fuel.

What effect further helium production in Saskatchewan would have on the economy is unknown. But the opportunity is there should additional exploration happen.

"I'm really hoping someone will take a look at that and say that we need to start exploring for helium here, here and here," Yurkowski said. "But that's all dependent on the exploration and the developers. But I know there's a lot of potential here for further helium production."

# Mother Nature's Tough Love

BY MARTIN CHARLTON COMMUNICATIONS

**E**nvironmentalists are quick to point fingers of blame at petroleum companies when there's a pipeline rupture and hundreds of thousands of litres of oil leak into waterways and onto agricultural land. More than 400 000 litres of oil spilled in Saskatchewan in two separate incidents in the past eight months. The damaged pipelines belonged to Husky Energy and Tundra Energy Marketing and each wore much venom from angry residents in several affected communities.

Mother Nature, though, received a free pass even though she was more to blame than anyone. Her unpredictable actions often ruin some of the best laid plans and designs from engineers and geoscientists.

## **Best Laid Pipelines Gang Aft Agley**

Saskatchewan's love affair with oil is no secret. Its production is vital to the economy and it's an industry that employs thousands. But it also has its naysayers. Environmentalists argue loudly that pipelines that carry oil to port pose a significant threat to delicate ecological reserve lands like the Great Sandhills north of Maple Creek and the Nebraska Wetlands stateside.





**A slope failure that nearly choked off Eagle Creek**

**“Slope stability, particularly at river crossings, is probably one of the most challenging aspects of maintaining our pipeline infrastructure.”**

So when more than 225 000 litres of heavy oil leaked in the North Saskatchewan River in the summer of 2016, environmentalists had another “I told you so” moment. Communities like Melfort, North Battleford and Prince Albert and almost everywhere in between were forced to shut off their water intake from the river and find alternative water sources for nearly two months. The oil slick travelled 380 kilometres downstream.

The pipeline belonged to Husky. The petroleum giant said the cleanup job cost more than \$90 million, not to mention the stresses it placed on communities and residents that were affected.

But before the finger of blame is pointed at Husky, take into consideration another culprit – Mother Nature. She is unpredictable. Ground movement was eventually tagged as the cause of the ruptures in the 19-year-old pipeline.

“The break was a sudden, one-time event in a section of the pipe that had buckled due to the force of ground movement,” read part of a post-incident report from Husky Energy.

Grant Ferguson, P.Geo., Eng.L., an associate professor of geological engineering at the University of Saskatchewan, echoed the findings from Husky.

“Slope stability, particularly at river crossings, is probably one of the most challenging aspects of maintaining our pipeline infrastructure. However, given the number of crossings and low frequency of incidents, I would suggest that this demonstrates that our geotechnical engineers have been rising to the challenge for the most part.”

Soil structures and perhaps seismic activity confound some of the best laid plans. Planning for so many unknown variables is nearly impossible.

### **Water You Going To Do?**

Slope movement in Saskatchewan is very much tied to the hydrologic conditions. Over the past seven or eight years the province has been in a bit of a wet phase and groundwater levels monitored by the Water Security Agency show that levels are exceptionally high.

By contrast, Saskatchewan went through a low phase through the early turn of the century before it took off again, with some of these areas several metres higher than what they have been historically.

As a result, soils weaken and there’s a greater chance of a slope failure.

“I think that’s a lot of what is going on with (the Husky pipeline rupture),” Ferguson said.

Ferguson said the pipeline crossing near Maidstone, site of the Husky line, was installed at a time when the water table would have been lower than what it is right now.

“Certainly conditions have changed in the soils around there,” he said. “What would have been a more stable situation back in the 1990s is not because we’ve had changes in the pore water pressure.”

Husky maintained the majority of the leaked oil was recovered and that no water bodies were impacted. But Ferguson lamented that soils along the riverbanks and at river bottom likely wouldn’t be as fortunate. In addition, in some cases wells used for drinking water and agricultural purposes would be affected.

### **Catalyst for Concern**

A second major oil leak in Saskatchewan was reported in January near Stoughton. This time, approximately 200 000 litres of oil spilled on low-lying agricultural land on a First Nation. Tundra Energy Marketing claimed responsibility for the spill, though the cause is still under investigation.

“The soils were such that we were seeing glacial tills throughout most of that area and low permeability. And so



Cherry Lane Road collapse in Saskatoon

## In this affluent neighbourhood, many landowners saw their backyards give way and crumble several metres down the riverbank.

whatever migration of contaminants you're going to have are not going to be that rapid," Ferguson explained.

These most recent spills are what fuel the protests from pipeline detractors. The much talked about Keystone XL pipeline route has the potential to disturb Saskatchewan's Great Sandhills region in the southwestern quadrant, in addition to slicing through the sensitive Nebraska Wetlands en route to the Texas gulf coast.

The Dakota Access line also has spurred controversy among many Native Americans in the Dakotas and Iowa who say the pipeline would impact sacred Indian burial sites and the quality of water in the area.

"If something did get into the ground, it would move quickly," Ferguson noted. "Instead of it moving a few metres over the year it might be a few metres over weeks or months. It's a major area for getting water into our groundwater systems and aquifers."

### Sinking Cities

Slope stability isn't just a concern for pipelines in rural areas. It has long been an issue along the east bank of the South Saskatchewan River in Saskatoon, particularly near Saskatchewan Crescent and 16th Street. In this affluent neighbourhood, many landowners saw their backyards give way and crumble several metres down the riverbank.

Further bank movement in the spring of 2016 forced the City of Saskatoon to close park trails and sidewalks in that neighbourhood for safety concerns.

In an effort to curb the lagging riverbank, a geotechnical site investigation resulted in the decision to construct an H-pile and concrete lagging retaining wall, conduct further earthwork on the lower slope and installation of sub-drains.

Though it's unclear what effect, if any, these projects will have on the stability and Mother Nature's will.

### Constantly Learning and Improving

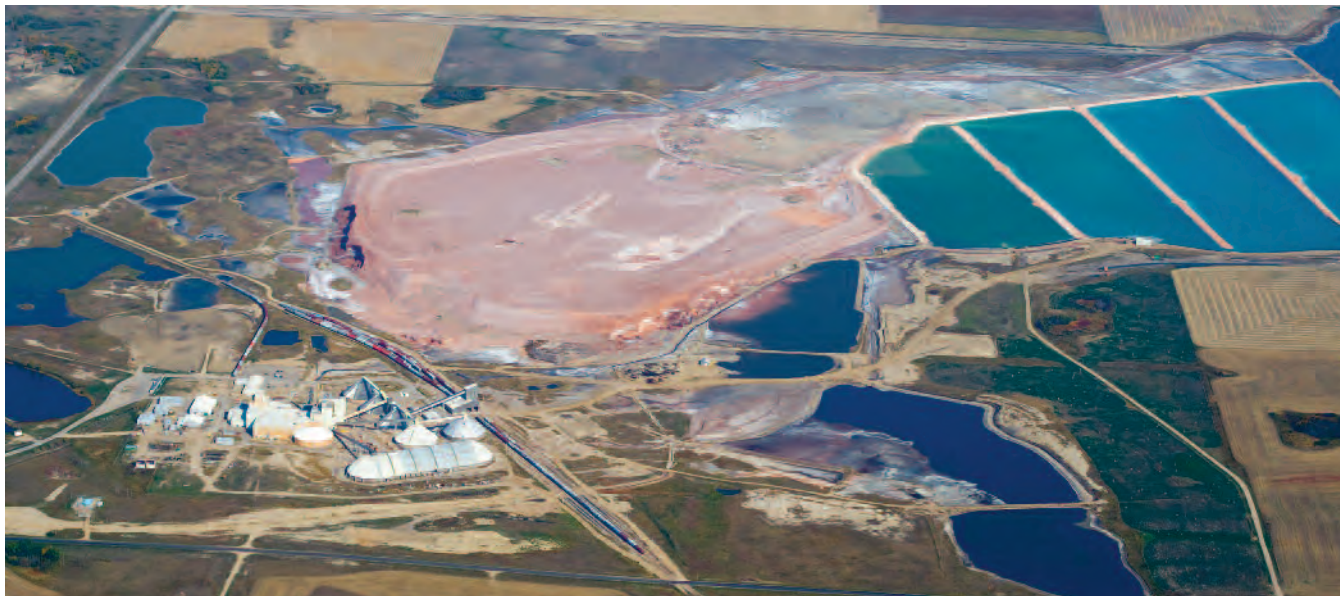
Pipelines expansion appears to be very much in Canada's and North America's near future. Both the Keystone XL and Dakota Access lines have been approved after years of delay.

Perhaps a silver lining to the oil leaks is the fact that engineers are gaining a better understanding of which areas are more sensitive, as well as learning how the geology interacts.

Ferguson said, "A lot of questions still remain on how this will all play out. We've talked about the end of oil. What will that look like? But at least we're learning about this now and asking the right questions, whereas before we would just lay down the pipe without considering the things we are now."

# A Tale of Tailings

BY MARTIN CHARLTON COMMUNICATIONS



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One of the first lessons most of us learned from our mothers was “if you make a mess, clean it up”.

**T**hat advice is easy to abide by when picking up dirty socks but becomes much more complicated when dealing with tonnes of tailings from mine sites. Fortunately for both Saskatchewan miners and the environment, engineers and geoscientists around the province are hard at work to make the process easier.

## What Are Tailings?

tailings are the waste (often a liquid slurry) left over after the valuable parts of mineral ore have been extracted. It is distinct from the overburden, the hard rock that has to be chipped away to get to the ore. While the overburden is just regular rock that can be put back where it came from, tailings often contain contaminants that turn them into major environmental hazards.

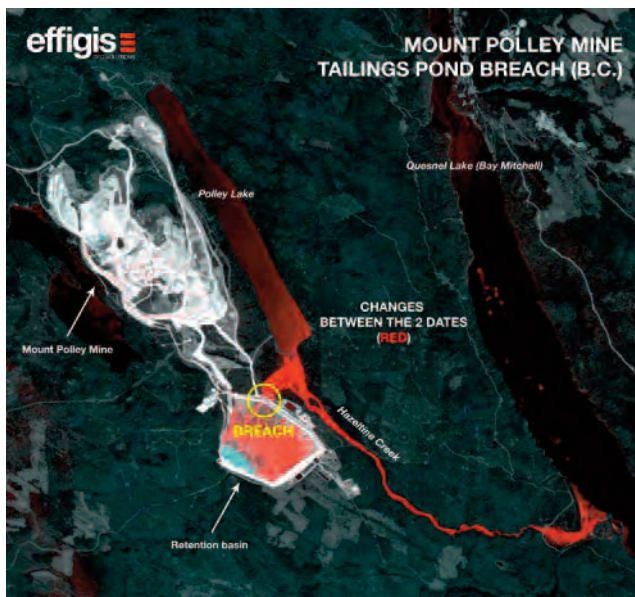
Dealing with these hazards is a challenge that has tested the skills of geologists and engineers from around the world. Mark Liskowich, P.Geo., a former government mine inspector who has conducted several mine studies through SRK Consulting, notes that the challenge of tailings lies not just in the waste products themselves but in the surrounding environment.

“The challenges of tailings vary by commodity but in most cases the biggest issue is not so much the tailings themselves but the water associated with them. Tailings management has to be approached in a holistic way that considers solids, contaminated water and the water table that surrounds them,” Liskowich says.

## Why are They Important?

The difficulty with tailings are that most mines produce a huge amount of them and typically keep them on site throughout the life of the mine, if not longer. Consequently when things go wrong with tailings, they often go very, very wrong.

One relatively recent incident in Canada that made headlines around the world was the massive Mount Polley spill in British Columbia in 2014. The dam containing the tailings for a copper and gold mine burst, releasing 10 million cubic metres of water and 4.5 million cubic metres of contaminated slurry into Polley Lake. In the end, the tailings pond was left virtually empty while Polley Lake was raised by 1.5 metres. Environmental consultants say the damage could last for years if not decades.



Closer to home, there is the ongoing story of the Gunnar uranium mine in the Uranium City area. The mine – which included both open pit and underground operations – operated from 1953 to 1963 and was abandoned in 1964 with very few, if any, site cleanup or environmental protection measures put in place.

The mine’s approach to dealing with its radioactive tailings are considered irresponsible by today’s standards. Approximately 4.4 million tonnes of tailings deposited during operation of the mine and mill were left open. The mine planned for these tailings to initially be dumped into Mudford Lake until the lake ultimately was filled. After that, the plan directed the tailings to a number of other areas near the mine with no consideration for how they might affect the environment.

### Project CLEANS

Cleanup of Gunnar is in the hands of the Saskatchewan Research Council, which has spear-headed Project CLEANS (Cleanup of Abandoned Northern Sites) – the remediation of 37 abandoned mine and mill sites in northern Saskatchewan. Their challenge is formidable, with the price tag for total site cleanup estimated by the Saskatchewan Ministry of Economy at \$268 million.

Key milestones for the Gunnar project came in 2015 and 2016 when the Canadian Nuclear Safety Commission approved SRC’s plans for remediating the site. SRC now has a contractor in place for the construction of the tailings cover to start in April 2017. In this case, the tailings cover will be composed of at least 0.6 metres of soil and aggregate.

### Cameco Innovations

While uranium tailings in the past were handled

haphazardly, modern uranium tailings management has come a long way thanks to innovative research at Cameco. Cameco pioneered the design and use of in-pit tailings management facilities. These engineered storage facilities are designed to protect the environment for thousands of years and are recognized as a best practice in tailings management around the world. Cameco maintains this type of facility at Key Lake and Rabbit Lake.

“This in-pit storage concept at Rabbit Lake was really a fantastic breakthrough and a turning point for uranium tailings storage in the mid-1970s. It remains a best practice throughout the industry,” Liskowich says.

A key feature of Cameco’s in-pit storage system is its dewatering technology, used to draw groundwater toward the in-pit tailings facilities, which ensures contaminants do not move into the surrounding environment. The water collected by these systems is treated to remove contaminants and then released to the environment. After operations have ceased, groundwater moves through a more permeable area that surrounds the tailings. This system ensures that groundwater flow through the tailings are limited and reduces the spread of contaminants from the tailings.

### Potash Searches for Solutions

While the uranium industry has made headway in tailings management, the potash industry has faced hurdles.

The increasingly popular solution method of potash mining produces relatively little in the way of tailings thanks largely to its liquid-based extraction methods. Conventional potash mines on the other hand face a thorny waste management problem.

Most potash mines produce a waste stream of water-insoluble material and primarily water-soluble sodium chloride salts collectively known as fine tailings. These tailings are discarded from the mill in the form of salt brine that is 70 per cent solid and 30 per cent liquid. It naturally flows and cannot be successfully stacked as is done with mines’ coarse tailings.

Fine tailings have been stored separately in shallow engineered ponds, or cells, that take up a great deal of land and remain soft indefinitely, providing little opportunity for capping with soil and then vegetation.

In 1999, PotashCorp entered into an agreement with Saskatchewan’s Ministry of the Environment that allowed it to build a new fine tailings cell at its Lanigan operation, provided it did extensive research to find a more environmentally acceptable solution to fine tailings disposal.

PotashCorp has invested millions of dollars into a research effort that has had its share of disappointments. A number of methods that looked promising in the lab proved either uneconomic or logistically unfeasible in the field.

All was not lost, however. Through this exhaustive research on removing brine from fine tailings, it was discovered that the liquid brine could be removed on site, after fine tailings were in modified engineered tailings ponds that would allow free brine to drain from the fine tailings into brine storage ponds – essentially leaving the tailings high and dry.

The most promising approach to future fine tailings management appears to be a method in which the tailings are pumped to a containment cell and the brine is allowed to flow freely through a permeable barrier – a porous berm constructed at the downstream end of the cell. This brine is recovered and the remaining fine tailings consolidated into a solid form similar to what can be achieved by centrifuge.

If this method succeeds, the fine tailings that are left over will be solid enough to stack vertically, which conserves land and will be more easily capped and planted when the facility is ready to be decommissioned.

PotashCorp, in cooperation with another potash company, continues to work on the technology.

### Pipe Flow Technology Centre

The potash industry’s struggles to deal with sludgy residue are mirrored by operations in the oil sands. In order to extract bitumen from mined oil sands, it is mixed with warm water. Once the bitumen has been removed, a tailings mixture of water, sand, silt, clay and residual bitumen is left over. This mixture is stored in tailings ponds where the majority of the solids settle to the bottom and the water is recycled through the bitumen extraction process.

The portion of tailings that does not quickly settle forms a layer in the middle of the pond. This mixture, called fluid fine tailings can take decades to form a solid, if left on its own. Industry researchers have developed a suite of tailings thickeners that help solidify the residue. However, the thickened tailings have the consistency of thick mud and thus, require different design techniques and equipment.

SRC’s Pipe Flow Technology Centre™ (PFTC) is aimed at researching how slurry pipelines behave and laying the foundation for developing pipelines that can effectively transport thickened tailings. SRC’s Pipe Flow Model is a tool that is used to help design slurry pipelines, making them more energy efficient, more reliable and reduce costs. To improve the model, there have been ongoing multi-party research projects over the years.

“The SRC Pipe Flow Model was developed over decades of research and is recently being improved through multi-client projects,” said Lesley McGilp, P.Eng., manager of SRC’s PFTC. “The most recent study will contribute to the development of a model that the mining industry can apply to systems involving laminar flows, including the transport of thickened tailings.”



Abandoned Gunnar mine site in Uranium City

### The Work Continues

Although we have come a long way since the days of the Gunnar mine, incidents like the Mount Polley spill show that there is still much more to be done to tackle tailings. At SRC and other research facilities in Saskatchewan and around the world, the work continues.

“SRC is looking towards the sustainable management and remediation of mine tailings areas. It is promising to see that, within the last 50 years, the industry has moved from the mentality of ‘return it to the earth’ towards well-thought-out tailings storage areas to meet the environmental protection requirements and to support traditional activities near and through former mine sites,” says Christopher Reid, P.Eng., project manager for environmental remediation at SRC.

The time is ripe for new methods in tailings management, Liskowich adds.

“The in-pit system in uranium mines works great but it requires a used-up mine. Those are getting harder to come by as uranium companies keep digging to greater depths in the same spots. That means you instead have to look at the possibility of digging a pit just for tailings storage, and that gets expensive.”

But Liskowich is confident that solutions can be found.

**“Engineers and geoscientists just need to go back to basics and think outside the box as they did back in the 1970s. I’m confident that with the right engineering focus and proper consideration for solids and liquids that the Mount Polleys of the world won’t occur.”**

# Member Profile



This month *The Professional Edge* chats with **Jason Craven, P.Ge.**, a uranium exploration geologist working with Cameco in Saskatoon.

## Tell us about your personal and professional background.

I was born and raised in Bengough, Saskatchewan where I went to the K-12 school. It was a place that had a great small-town atmosphere. The world seemed pretty big coming from Bengough. After high school, I went to the U of R where I studied geology with a minor in geography.

## Why did you choose to go into geoscience?

I actually started out as a history major. In my first year in university, I took a variety of classes including geology. I found that geology is the ultimate form of history. People normally have appreciation for time in human terms but with geology you can study the history of everything.

I became fascinated – as I still am to this day – with solving the mysteries of the Earth one piece at a time. So I reassessed where I was headed with my life and switched to geology.

Looking back, the decision was crazy and very naive. There were no jobs in the field at the time. But I got lucky and got a job with Cameco right out of university. Many of my peers weren't so lucky. I look at the summer students we have working for us today and they are all so much more savvy about jobs and their careers than I was.

## What was your biggest challenge in college?

My biggest challenge was adapting to city life coming from a small town. I didn't know anyone when I arrived on campus. But I solved that by living in Luther Residence. It helped me meet people and helped me bring out my extroverted side. My experiences there played a big role in how I have come to carry myself at work and in life.

I also met a lot of people through the program. Geology was a small, close-knit group. We all knew each other's names and so did the professors – for better or worse.

## You went to work for Cameco straight out of college. What was the transition like from school to work?

I was thrown into work at Cameco two days after my last final. It was a big adjustment – shocking, really. In the industry, they take what you've learned in school and mould it into a new purpose. But there wasn't a point where I felt what I had studied was useless. The great thing about working with Cameco is that you take what you've learned in school and use a lot of it in your career which is validating.

## What do you feel was your single greatest accomplishment as geoscientist?

I can't think of one particular accomplishment but I've been a part of some exciting times on discovery teams. As a supervisor, I find it gratifying to be able to see my teams grow and develop and to see what they go on to accomplish later in their careers.

## What are your interests outside of work?

I think I've lost childhood memories to make room for the amount of pop culture in my head. These interests led me to comic conventions. I find they have a great culture of accepting everyone. Through that



channel I've done a little bit of cosplay, dressing up as science fiction and video game characters.

I love team sports where, like the conventions, I appreciate the inclusive accepting atmosphere with the bonus of competition. I also love being outdoors so it's great to have a job that lets me do that.

### Have you ever met anyone famous?

I have a wall of photos with celebrities from the comic conventions but my favourite celebrity encounter was a random one. At a Calgary convention, I ran into Anthony Daniels (who played C3PO in *Star Wars*) in a liquor store. He was picking out wine. I chatted with him for a bit. He was very gracious and I got a photo with him.

### What is your favourite vacation spot?

I like to travel a lot – First World, Third World, doesn't matter – and I don't like going to the same place twice. Among the places I've visited, some places that have stood out to me include Brazil and the area around Darwin at the extreme northern tip of Australia. And, of course, the Grand Canyon – as a geologist, I was pretty blown away by the sight of that.

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

For my life in general, I would say my wife. Her drive and work ethic humble me on a daily basis. She is a doctor. She had a tough time getting into medical school but she knew it was her passion so she just worked harder to get in. I can't complain about anything in life because she works so hard and is an inspiration. We are both doing what we are passionate about so we provide a positive feedback loop to each other.

As for my career, a couple of guys come to mind. Ralf Maxeiner, P.Ge., with the Geological Survey, taught me to lead by example. Chris Hamel, P.Ge. taught me a lot about the nuances of being a leader and supervisor.

## Saskatoon Engineering Society Awards

On September 29, 2016, the Saskatoon Engineering Society held its Annual General Meeting at the Saskatoon Inn. The event featured the presentation of the SES Engineer of the Year Award and SES Educator of the Year Award.

### Don Poon, P. Eng.

#### 2016 SES Engineer of the Year Award



Doug Drever, P. Eng., President of the Saskatoon Engineering Society, presenting the SES 2016 Engineer of the Year Award to Don Poon, P. Eng.

### James (J.D.) Johnston, P. Eng.

#### SES Educator of the Year 2016



Doug Drever, P. Eng., President of the Saskatoon Engineering Society, presenting the SES 2016 Educator of the Year Award to James (J.D.) Johnston, P. Eng.

# Double Your Fun

## The Children's Discovery Museum Capital Campaign



**T**he Children's Discovery Museum on the Saskatchewan (CDM), a not-for-profit organization, aims to create a world-class facility in Saskatoon where children and their families can come together to explore science, culture and art.

The museum is currently located in Market Mall in Saskatoon but plans to open a new, improved museum in the former Mendel Art Gallery when the civic art gallery moves to its new home at the Remai Modern.

The new museum will feature unique exhibits, educational programming and commitment to diversity and local heritage. It will become a creative springboard for the children of Saskatoon and the province, fostering a lifelong love of learning.

CDM's capital campaign has a fundraising goal of \$10 million. Saskatoon's engineering community has already been doing its part through an initiative called Saskatchewan Engineers Encouraging Discovery (SEED). In 2016, CDM also approached APEGS to make a capital donation. A task group chaired by Ben Boots, P.Eng. FEC, was formed to consider the request.

"This was sort of unfamiliar territory for APEGS because we had not previously done much in the way of capital donations. We have tended to focus more on programming-oriented donations. But we didn't have an overarching policy that prevented it so we took our time to ensure that it lined up with the APEGS Value Proposition (AVP)," said Boots.

This process included numerous meetings as well as a surprise tour of the existing CDM facility.

In the end, the task group found that there were linkages to seven APEGS committees and that it conformed to the AVP principle of promoting the profession to children and youth.

As a result of this recommendation, APEGS Council agreed to a direct donation to CDM of \$25,000 a year for 2016-18. As well, APEGS will match the donations that any APEGS member makes to the SEED campaign up to a total maximum of \$100,000.

APEGS President Tara Zrymiak, P.Eng., FEC notes that the potential benefit for member donations goes even further than that.

"Another anonymous donor has already offered to match all individual donations so, for APEGS members, when you donate to this campaign your donation amount will be tripled," Zrymiak said.

Zrymiak encouraged all members to consider doing what they can to support this campaign.

"I've seen the mock-ups and this looks like it is going to be an exciting facility that will be a lot of fun for all ages. This is something that will benefit society and the professions as we make children aware how much they can contribute to the world and make their own dreams come true through the professions. As well, this is a place that your own kids and family will enjoy."



# APEGS Member Disciplined for Professional Misconduct

**A** Professional Engineer member of the Association of Professional Engineers and Geoscientists of Saskatchewan pleaded guilty to one count of professional misconduct before a Hearing Panel of the Discipline Committee on November 24, 2016.

Counsel for the Investigation Committee and for the member filed an Agreed Statement of Conduct with the panel, which was accepted as an admission of professional misconduct by the member. The joint submission contained the following admission:

- that the member submitted a paper for publication in a journal, a portion of which referenced a previously published joint paper co-authored by the complainant, but which failed to acknowledge the contribution of the complainant and constitutes professional misconduct.

The panel determined that this action by the member was in breach of section 20(2)(e) of The Regulatory Bylaws, 1997 and that this breach constituted professional misconduct as defined in section 30(c) of *The Engineering and Geoscience Professions Act*.

Counsel for the Investigation Committee and for the member also filed a Joint Submission as to Disposition.

**In arriving at its decision, the panel considered the following factors:**

- there was no prior disciplinary action by the Association for similar behaviour conducted by the member;

- gravity of the conduct;
- risk to public safety;
- specific deterrence of the member from engaging in further misconduct;
- general deterrence of other members of the profession from engaging in similar misconduct;
- rehabilitation of the member;
- punishment of the member; and
- denunciation by the profession of the conduct.

**The Hearing Panel also considered the following mitigating circumstances:**

- member's experience;
- history of the member's professional conduct; and
- member's acknowledgement of responsibility.

**Having taken into account all of the above, the Hearing Panel ordered as follows:**

1. That the member be reprimanded for professional misconduct.
2. That the particulars of this disposition and sentence be published in *The Professional Edge*, without names.

# Awards Winners & Awards Banquet

**Saturday, May 6, 2017**

Reception 6:00 pm. Banquet 7:00 pm | Hotel Saskatchewan, Regina

## **FRIEND OF THE PROFESSIONS AWARD**

Norman Sacuta

This award was established in 2013 to recognize exceptional achievements or unique contributions by a non-member in the promotion of the professions.

## **PROMISING MEMBER AWARD**

Michael S. Nemeth, P.Eng.

The Promising Member Award was established in 1998 to recognize exceptional achievements by a professional member in the early stages of his/her career in Saskatchewan.

## **ENVIRONMENTAL EXCELLENCE AWARD**

Saskatchewan Power Corporation – The Industrial Energy Optimization Program

The Environmental Excellence Award was established in 2005. It is given in recognition of exceptional achievements by an individual or team in the application of engineering, geological and/or geophysical methods related to environmental protection and preservation.

## **EXCEPTIONAL ENGINEERING/GEOSCIENCE PROJECT**

Saskatchewan Geological Survey - Saskatchewan Geological Atlas

This award, founded in 2001, recognizes accomplishments in engineering and/or geoscience. The project team must be predominantly made up of Saskatchewan engineers or geoscientists. The project may be located in or outside Saskatchewan.

## **MCCANNEL AWARD**

Rick B. Kullman, P.Eng., FEC, FGC (Hon.)

The McCannel Award was established in 1983 to honour service to the Association of Professional Engineers and Geoscientists of Saskatchewan, and to the professions as a whole. The McCannel Award is named after Roy McCannel, a founding member of the Association.

## **OUTSTANDING ACHIEVEMENT AWARD**

Michael T. Sulatisky, P.Eng.

The Outstanding Achievement Award was created in 1998 to honour members who show technical excellence and achievement in engineering and/or geoscience in Saskatchewan.

## **BRIAN ECKEL DISTINGUISHED SERVICE AWARD**

Dwayne A. Gelowitz, P.Eng., FEC, FGC (Hon.)

This award was established in 1978 to recognize outstanding contributions in service to the community, the Association, technical and learned organizations, as well as to honour distinctive and outstanding achievements in professional and technical fields. The Distinguished Service Award is an honour given only to those who truly exemplify the best standards of engineering and geoscience in Saskatchewan. In 2004 this award was renamed the Brian Eckel Distinguished Service Award in recognition of Brian Eckel's contribution to society, the profession and the Association.

**Tickets:** \$50 per person

**Contact:** APEGS

300-4581 Parliament Ave, Regina, SK S4W 0G3

Tel: (306) 525.9547 | Toll Free: 1.800.500.9547

Email [apegs@apegs.ca](mailto:apegs@apegs.ca)

Register online: [www.apegs.ca](http://www.apegs.ca)



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# Cardboard Boat Races - An APEGS Tradition

**A**ttention Saskatoon and area APEGS volunteers: We have an opportunity for you to help out in the community and promote engineering and geoscience to students. What can you do with cardboard, duct tape and a large pool of water? Have a lot of fun – that’s what!

Judges are needed for the 2017 Cardboard Boat Races being held over the course of five weeks in May and June at SIAST Kelsey Campus and Harry Bailey Aquatic Centre. This is an annual event in Saskatoon for grade 7 and 8 students to teach structure and design in a fun and meaningful way. Students construct their vessels using only cardboard, duct tape and packing tape during the morning session and then put them to the test in the pool during the afternoon session.

APEGS has provided judges for the event for the past 10 years. This is a great way to promote engineering and geoscience and connect with students and teachers. Judges are assigned to evaluate the build during the construction in the morning and assist with timing the races in the afternoon. In previous years we have been able to provide enough judges to allow as many as 2,500 students in 44 teams to participate in this event.

There are 13 dates scheduled between May 16 and June 16 and judges are required from 9:30 am to 2:45 pm. Lunch is provided for all judges. Free parking is provided. You can volunteer for one or more dates if interested. More detailed information from the event organizers will be sent to confirmed volunteers. Two to three volunteers have been requested by the event organizers for each day.

### 2017 Cardboard Boat Races:

#### Dates:

Tuesdays: May 16, May 30, June 6, June 13

Thursdays: May 18, May 25, June 1, June 8, June 15

Fridays: May 26, June 2, June 9, June 16

#### Times:

9:45 am - Arrival

10:00 am - 11:45 am – Judging of boat construction

11:45am – 12:50 pm - Lunch: Subway lunch provided (Most dietary restrictions can be accommodated)

12:50 pm - 2:45 pm – Judging and coordination of races at Harry Bailey Aquatic Centre

#### Location:

SIAST Kelsey Campus, Idylwyld Drive, Agriculture Machine Lab and Harry Bailey Aquatic Centre

#### Please respond to:

Jodi Derkach, P.Ge.

APEGS Kindergarten to Grade Twelve Committee  
[jodi.derkach@potashcorp.com](mailto:jodi.derkach@potashcorp.com)

Thank you in advance for volunteering!



## Eight Saskatchewan Engineers to Receive CSSE Fellowship Awards

SUBMITTED BY: PIETER VAN VLIET, P.ENG., FEC, FCSSE – CSSE SASKATCHEWAN DIRECTOR

**T**he Canadian Society of Senior Engineers (CSSE) 2017 Annual Meeting will be held in Regina on May 12-13, 2017. The host committee, led by CSSE's President-Elect, Shawna Argue, has planned a varied program of activities. For more details, visit: [www.seniorengineers.ca](http://www.seniorengineers.ca).

This is the first CSSE Annual Meeting being held in Saskatchewan with some exciting program highlights.

On Friday, May 12, the program starts with a welcome reception at the Saskatchewan Science Centre (6-9 pm), including a private viewing of the APEGS Sponsored IMAX film *Dream Big* – a film aimed at attracting youth to the engineering profession. This film is sponsored by APEGS as part of its 30 by 30 initiative.

On Saturday, May 13, the Annual Meeting will be held, along with a partners program and a fellowship banquet during which 14 engineers from Western Canada will be receiving Fellowship Awards. Eight engineers from Saskatchewan will be honoured. At lunch, as part of the CSSE objective promoting public awareness of the engineering history of Canada, we will be celebrating the 50th anniversary of the Gardiner Dam project.

Professional Engineers and applied scientists interested in the work of the CSSE are invited to attend the meetings.

### What is the CSSE/SCIS?

The Canadian Society of Senior Engineers (CSSE), La Société canadienne des ingénieurs séniors (SCIS), formerly the Life Members Organization (LMO) is a committee of the Council of the Engineering Institute of Canada (EIC).

CSSE/SCIS membership is made up of senior engineers, applied scientists and others who have worked in an engineering environment or have otherwise practised in as well as supported the profession for over 20 years. The mission and objectives of the CSSE/SCIS are to maximize the well-being of all Canadians, drawing upon the practical experience, knowledge, skills and wisdom of its senior, multidisciplinary membership.

For more information visit [www.seniorengineers.ca](http://www.seniorengineers.ca)

# The Story on Solar

## A Report from the Environment and Sustainability Committee

SUBMITTED BY IAN LOUGHRAN, P.ENG.

*Opinions expressed do not necessarily reflect the views or policies of APEGs*

**W**ith the growth in the solar industry in Alberta and Saskatchewan, we may be asking ourselves, “Is solar photovoltaic (PV) economic?”. When contemplating how to respond to this, one must ask, “What defines economic?”

There is an economic difference between rooftop or small-scale solar PV (typically in the 2-10 kW range), larger ground mount systems (10-100 kW) and utility-scale solar farms (5 MW plus).

Currently, through SaskPower’s net metering program, any resident or business can install solar PV on their building up to 100 kW. The average house has somewhere between 2-6 kW of available roof space. In Saskatchewan, we are currently seeing installed costs of solar PV systems ranging from as low as \$3 per watt to around \$4 per watt. We have seen numbers drop rapidly in solar PV since 2009, from \$9 to \$12 per watt to the current rates. This is a significant change. And while the curve is flattening out and the year-over-year decreases are far less now, the current installed costs are surprisingly economic.

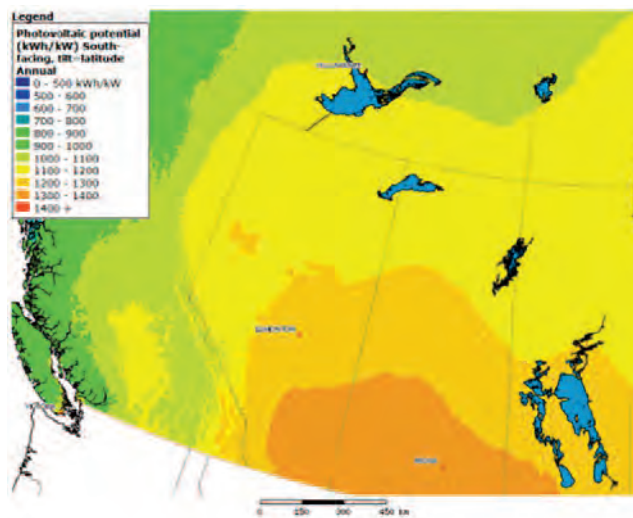
If we use southern Saskatchewan and look at Natural Resources Canada’s solar insolation map, we see promising energy levels available from the sun.

If we use Regina as an example, at an annual production of 1300 kWh/kW installed and use the average of 3.0 kW on a house with southern exposure (no building or tree shading), we have 3900 kWh of energy production per year.

If we assume that the residential retail price per kWh from SaskPower is \$0.15/kWh, we have \$585 per year in energy savings. If we assume the average solar PV installed costs are \$3.5/watt, for a 3kW system we have an installed cost of \$10,500.

That may not sound like a good investment, as some would just divide the \$585 into \$10,500 and conclude it is an 18-year simple payback. However, we know that power rates are going up about 6 per cent per year. So with this math in hand, we then get a payback of approximately 12 or 13 years.

Some may still argue that this is not a good investment but consider levelized cost or lifetime energy costs.



The levelized cost is the total capital and operating costs over the useful life of the power generation asset, divided by its total energy production over the system life. There are financing charges, time value of money, inflation and other items in this calculation but in its simplest form we can use the example above to show proof of concept.

If we assume that the useful life of a solar system is 25 years and we use a \$0.005/kWh operations and maintenance fee and a 0.5 per cent system degradation per year, the 3.0 kW system described above will have a levelized cost of about \$0.12/kWh and will stay the same over its lifespan. This is already \$0.03/kWh lower than the residential retail rates from SaskPower. SaskPower also currently offers a net metering rebate of 20 per cent of the capital investment for a solar system, so with this rebate the levelized cost of this solar PV system would be \$0.10/kWh.

One can draw one’s own conclusions based on this but it is clear that solar orientation of buildings, taking advantage of solar PV and passive solar (enabling the sun’s free heat to be used in a building), is going to be common in the coming decade. Whether to save money or to offer a small buffer from a pending carbon tax, investment in solar PV is going to continue to increase in value and opportunity.





87th Annual Meeting and Professional  
Development Conference

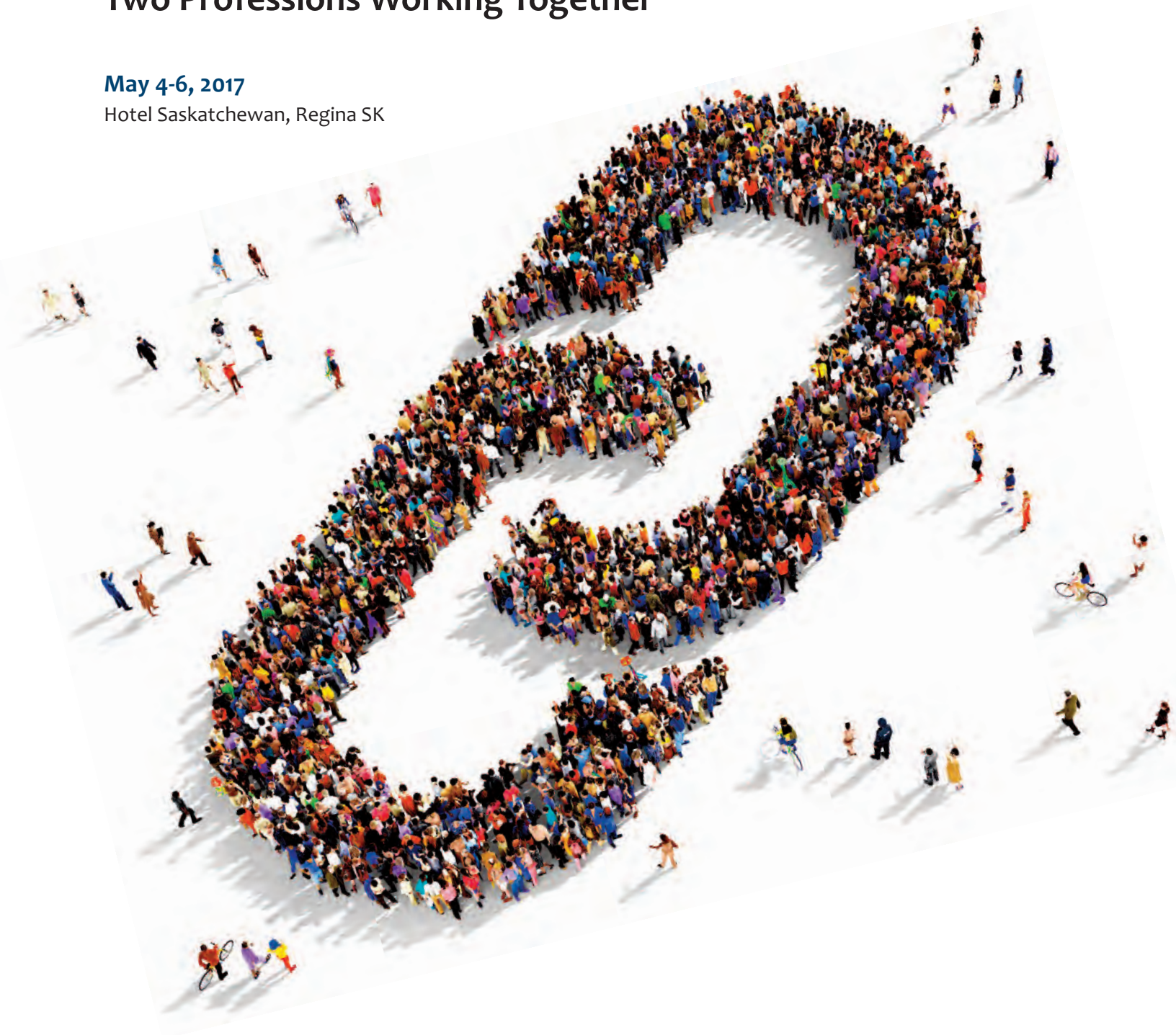
# *A Celebration of Unity*

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**May 4-6, 2017**

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# Event Schedule

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## Thursday, May 4

Welcome Event ..... 6:00-10:00 pm  
IMAX Production DREAM BIG! ..... 8:00 pm

## Friday, May 5

Buffet Breakfast ..... 7:30-8:30 am  
Professional Development Plenary ..... 8:30-10:00 am  
Professional Development Streams ..... 10:20-12:00 noon  
Professional Development Luncheon ..... 12:00-2:15 pm  
Professional Development Streams ..... 2:30-4:10 pm  
Afternoon Tour ..... 2:30-4:30 pm  
Past Presidents / Council Meeting ..... 3:00-4:00 pm  
Past Presidents' Dinner ..... 5:00-8:00 pm  
President's Reception ..... 8:00 pm

## Saturday, May 6

Buffet Breakfast ..... 7:30-9:00 am  
Annual Meeting ..... 8:30-9:00 am (Registration)  
Annual Meeting ..... 9:00 am (Business Meeting)  
Kids Camp ages 4-6 ..... 8:30 am-4:30 pm  
Youth Science Day ages 7-14 ..... 8:30 am-4:30 pm  
Partners Program ..... 10:00 am-3:00 pm  
Recognition Luncheon ..... 12:30-2:30 pm  
Committee Meetings ..... 2:30-4:30 pm  
Awards Banquet ..... 6:00-7:00 pm (Reception)  
Awards Banquet ..... 7:00 pm (Banquet)

# Professional Development Luncheon

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Friday May 5, 2017, 12:00 2:15 pm

Hotel Saskatchewan - Regency Ballroom



## Philip Currie

Keynote Speaker

**Dr. Phil Currie** is an internationally renowned palaeontologist whose scientific accomplishments have led to a greater understanding of dinosaurs and their historic significance. He was instrumental in the development of Alberta's Royal Tyrrell Museum and has made major contributions to palaeontology on both the Canadian and the world stage through his extensive field work, academic research, writing and teaching.

*Alberta Order of Excellence Award*

*Research Associate at the Royal Tyrrell Museum of Palaeontology*

*Received an Honorary Doctorate of Laws at the University of Calgary (June 2008)*

### Research Interests

Currie works on dinosaurs, focusing on problems with growth and variation, the anatomy and relationships of carnivorous dinosaurs and the origin of birds. He has as a long term goal of understanding the rich Cretaceous ecosystem of Dinosaur Park, and contemporaneous faunas and habitats of other sites in western North America. He is also interested in what can be learned about dinosaurian behaviour, including annual and intercontinental migrations.

He has been interested in dinosaurs since childhood. He finds that the excitement of discovery (fossils in the field, and ideas in the "lab") constantly renews his interest.

His fieldwork connected with his research has been concentrated in Alberta, British Columbia, the Arctic, Argentina and China. His work on the *Centrosaurus* bonebed, the origin of birds, "feathered" dinosaurs, hadrosaur nesting sites and the Canada-China Dinosaur Project has attracted the greatest international attention.

# Professional Development Tracks

Friday May 5, 2017 | 8:30 am - 4:10 pm | Lobby and Conference Levels | Dress: Business Casual

8:30-10:00 am	<p align="center"><b>Continuing Professional Development Plenary</b></p> <p align="center"><b>Panel:</b> Chris Roney, Grant Koropatnick, Leigha Hubick <b>Moderator:</b> Shawna Argue</p> <p align="center">Regency Ballroom</p>			
10:00-10:20 am	<p align="center"><b>Energy Break</b></p>			
	<p align="center"><b>TRACK 1</b></p> <p align="center"><i>Past</i></p> <p align="center">Saskatchewan Suite</p>	<p align="center"><b>TRACK 2</b></p> <p align="center"><i>Present</i></p> <p align="center">Wascana Room</p>	<p align="center"><b>TRACK 3</b></p> <p align="center"><i>Future</i></p> <p align="center">Victoria Room</p>	<p align="center"><b>TRACK 4</b></p> <p align="center"><i>Unity</i></p> <p align="center">Oak Room</p>
10:20-11:05 am	<p>Vimy Ridge - The Role of Science in a Canadian Victory</p> <p align="center">Don Gendzwill</p>	<p>Feeding a Growing World: Canada's Grain Handling and Marketing System</p> <p align="center">Leigh Lamontagne</p>	<p>Autonomous Vehicle: Impact on Engineering Disciplines</p> <p align="center">B. Carl Kuhnke</p>	<p>30 by 30: Women in the Professions</p> <p align="center">Menzer Pehlivan Margaret Anne Hodges 30 by 30 Task Group</p>
11:15-12:00 pm	<p>Vimy Ridge (Continued)</p>	<p>The Regina Bypass Project</p> <p align="center">Josh Binkley Ryan Loewen</p>	<p>Remote Sensing for Terrain Analysis</p> <p align="center">Lynden Penner Troy Zimmer</p>	<p>30 by 30 (Continued)</p>
12:00-2:15 pm	<p align="center"><b>Professional Development Luncheon Keynote Speaker Dr. Philip Currie</b></p>			
2:30-3:15 pm	<p>A Wilderness to Operate Upon - Sanford Fleming and the Canadian Pacific Railway Surveys</p> <p align="center">Bill Waiser</p>	<p>CHOPS and Wormholes and CSI: The Mysteries of Enhanced Oil Recovery</p> <p align="center">Erik Nickel</p>	<p>Landfill Gas</p> <p align="center">Greg Kuntz</p>	<p>Equity and Diversity: A Respectful and Inclusive Workplace</p> <p align="center">John Moffat</p>
3:25-4:10 pm	<p>History of the Iron Ring</p> <p align="center">Richard Strayer</p>	<p>Uranium Mining</p> <p align="center">David Thomas</p>	<p>The Quill Lakes</p> <p align="center">Clinton Molde</p>	<p>Geology and Slope Stability in Saskatchewan</p> <p align="center">Grant Ferguson David Elwood</p>



# Continuing Professional Development Plenary

**Friday, May 5, 2017**

8:30 – 10:00 am

Hotel Saskatchewan - Regency Ballroom

**A presentation by Chris Roney, P.Eng., FEC –  
Engineers Canada President**

*Lessons Learned from the Elliot Lake Inquiry, the  
Charbonneau Commission and the Mount Polley Failure*

**Followed by CPD Panel Discussion**

- Moderator - Shawna Argue, P.Eng., FEC, FCSSE, FGC (Hon.)
- Panel members:
  - Chris Roney, P.Eng., FEC
  - Grant Koropatnick, P.Eng., FEC – CEO and Registrar –  
Engineers and Geoscientists Manitoba
  - Leigha Hubick, CPA – Director of Regulatory Affairs,  
CPA Saskatchewan

The panel will provide some insights to our members on what is happening within the engineering and geoscience professions nationally, as well as with other self-regulated professions locally on the topic of Continuing Professional Development.

**Chris Roney, P.Eng., FEC**

Roney is a practising structural engineer, and president of Roney Engineering Limited, a Kingston, ON, consulting firm offering a full range of structural engineering services related to building design and construction, investigations, assessments and restorations throughout Canada. Roney has practiced structural engineering since graduating with honours from Queen's University in 1990. He is accredited as a Building Design Specialist and Consulting Engineer, and is a Fellow of Engineers Canada.

Roney is a member of Professional Engineers Ontario (PEO) and has served on a number of key PEO committees and task forces over the past 18 years. He was a leading member of, and spokesperson for, PEO's task force that responded to the tragic collapse of the Algo Mall in Elliot Lake. He appeared at the Elliot Lake Inquiry as an expert and helped draft many of the PEO recommendations that the inquiry ultimately adopted.

**Grant Koropatnick, P.Eng., FEC**

Grant is a graduate civil engineer with a certificate in human resource management, both from the University of Manitoba. He has been a member of the Association since 1992. He has held technical and managerial positions in human service environments including the University of Manitoba and latterly with the Pembina Trails School Division as senior operations manager overseeing the

operation of 35 school and administration buildings in southwest Winnipeg.

Born and raised in Winnipeg, Grant lives in the Bridgewater Lakes neighbourhood with his wife Robyn (who is an electrical engineer). In his spare time, he enjoys a variety of interests including public speaking, writing, works of art and personal fitness.

**Leigha Hubick, CPA, CA**

Leigha Hubick, CPA, CA obtained her professional accounting designation in 2006. Leigha is currently the director, regulatory affairs with the Institute of Chartered Professional Accountants of Saskatchewan (CPASK) and has worked with the Institute since 2011. Through her role at CPASK, Leigha is on two national CPA subcommittees, the Continuing Professional Development Subcommittee and the Public Practice and Advisory Services Subcommittee.

Leigha has worked in both public and private sectors over the last 15 years.

Leigha has donated her time volunteering and participating with various organizations including Hockey Regina, MacNeill School Community Council, University of Saskatchewan Alumni Association, Regina Red Sox and the Highland Curling Club.

## Business Meeting

**Saturday May 6, 2017**

Hotel Saskatchewan - Blue Lounge / Library

Registration .....8:30-9:00 am

Business Meeting .....9:00 am

*The Engineering and Geoscience Professions Act and Bylaws* require that the annual meeting of the Association be held in the first six months of the year at a place in Saskatchewan determined by Council.

The 87th Annual Meeting of the Association will be called to order at 9:00 am Saturday May 6, 2017 at the Hotel Saskatchewan, Regina SK. Members must register between 8:30 and 9:00 am to obtain a voting card. The agenda for the meeting includes:

- Minutes from the 2016 Annual Meeting
- Business arising out of the minutes
- Reports from committees
- Audited financial reports
- New business
- Report of the scrutineers

# Council Notes

The APEGS Council met on Thursday February 2 and Friday February 3, 2017 at the Hotel Saskatchewan in Regina. Seventeen of 19 councillors were present. Chris Roney, P.Eng., FEC, president of Engineers Canada, attended as a guest. Council is scheduled to meet next on April 6 and 7, 2017 at the Delta Bessborough in Saskatoon.

## Council received the following presentations and information items:

- Activity updates were provided from the constituent society liaisons, the ACEC-SK Liaison and the APEGS Directors to Engineers Canada and Geoscientists Canada.
- The APEGS Director of Registration provided an update on the 2017 waiver/resignation statistics, renewal season rejoin statistics and historical registration count. It was noted that the membership had grown by approximately 3 per cent in 2016. An update on the APEGS database upgrade project was also provided.
- Engineers Canada's President Chris Roney, P.Eng., FEC provided highlights from Engineers Canada including: a new process to engage the regulators and their Councils on what is needed from Engineers Canada and provide feedback to the Linkages Group; the Prospectus Project in place to deal with the plans and concerns of the constituent associations and board members; an overview of the APEGBC Organizational Quality Management program; accreditation visits, the existing accreditation system and new accreditation systems; mobility of engineers in Canada; and PEO's approach towards CPD, which is based on the member's scope of practice and risk to the public.
- An update on ongoing discussions with the Children's Discovery Museum.
- An update on the 30 by 30 activities for 2017 and proposed bursaries for each university designed to attract women registered in other STEM areas to engineering or geoscience.
- The APEGS Director of Education and Compliance updated Council on the Pacific North West Economic Region activities.
- The APEGS Director of Education and Compliance provided an update on the Continuing Professional Development reporting levels.

## Council passed motions as follows:

- Appointing Stormy Holmes, P.Eng., FEC as a member of the Audit Committee for a two-year term and Dave

Kent, P.Eng., FEC and John Unrau, P.Geo. as members of the Audit Committee for a one-year term.

- Approving the capital gift to the Children's Discovery Museum as follows: \$25,000 to be paid in each of 2016, 2017 and 2018; and a lump sum not to exceed \$100,000 in value to match personal donations made by APEGS members to be paid by September 30, 2018.
- Establishing the APEGS Transitioning to Engineering / Geoscience Bursaries. These bursaries support women starting in other fields of study who decide to move into engineering or geoscience during their tenure at the university. The bursary amounts, numbers and application criteria will be determined in consultation with the universities.
- That APEGS proceed with a pilot of the online Competency-Based Assessment system of APEGBC and authorizing the Executive Director and Registrar to sign the Online Competency Assessment Project Agreement.
- Approving the amended policy AR3.0 Academic Review Policy – Engineering.
- Life Membership was approved for the following members:

Altwasser, David B., P.Eng.

Anderson, Hal A., P.Eng.

Au, John D., P.Eng.

Audet, Luc, P.Eng.

Ball, John A., P.Eng.

Barteski, Lloyd E., P.Eng.

Basnett, Richard, P.Geo.

Beck, James R., P.Eng.

Bennion, Norman L., P.Eng.

Bogle, Edward W., P.Geo.

Brandsema, Willem, P.Eng.

Brooks, Ross I., P.Eng.

Brown, Eric W., P.Geo.

Butler, David W., P.Eng.

Cameron, David H., P.Eng.

Cannon, Lorne B., P.Eng.

Cramer, Mark F., P.Eng.

Cron Andrew Bruce, P.Eng.

Cross, Herbert W., P.Eng.

Davachi, Mickey M., P.Eng.

Day, Dennis S., P.Eng.

Denys, Jacek M., P.Eng.

Fedirchuk, David J., P.Eng.

Frank, Leslie D., P.Eng.  
 Franklin, Paul R., P.Eng.  
 Fredlund, Delwyn G., P.Eng.  
 Frehlich, Richard J., P.Eng.  
 Freimanis, Peter, P.Eng.  
 George, Brian F., P.Eng.  
 Goertz, James H., P.Eng.  
 Gullen, Kenneth W., P.Eng.  
 Hackman, Allan B., P.Eng.  
 Hamad, Fathi, P.Eng.  
 Heikoop, Martinus, P.Eng.  
 Howe, Wayne F., P.Eng.  
 Hundebly, David R., P.Eng.  
 Hutch, James P., P.Eng., FEC  
 Iwaniw, Dr. Marie A., P.Eng.  
 Kelln, Kenneth C., P.Eng.  
 Kent, Donald M.J., P.Eng., P.Geo., FEC, FGC  
 Klassen, Victor R., P.Eng.  
 Korus, Andrew, P.Eng.  
 Jamieson, Gary H., P.Eng.  
 Jensen, Jack H., P.Eng.  
 Lebersback, John P., P.Eng.  
 Lee, David A., P.Eng.  
 Lehnert-Thiel, Klaus, P.Eng.,  
 Leung, Howard S., P.Eng., P.Geo.  
 Li Wan Yan, Karl, P.Eng.  
 Mandic, Miroslav, P.Eng.  
 Martin, Lloyd R., P.Eng.  
 McMillan, John A., P.Eng.  
 McNutt, James A., P.Geo.  
 Melis, Lawrence A., P.Eng.  
 Mittal, Hari K., P.Eng.  
 Moffat, Richard P., P.Eng.  
 Moore, Garth W., P.Eng.  
 Murray, Donald W., P.Eng.  
 Nelson, Larry C., P.Eng.  
 Paddock, Dennis K., P.Eng., FEC, FGC (Hon.)  
 Peace, Glen A., P.Eng.  
 Pelletier, Steven L., P.Eng.  
 Pronovost, J.R. Robert, P.Eng.  
 Pyesmany, James L., P.Eng.  
 Ransom, Floyd H., P.Eng.  
 Ritchie, Harlan M., P.Eng.  
 Robertshaw, Philip, P.Geo.  
 Sali, Marshall G., P.Eng.  
 Salisbury, Howard R., P.Eng.

Schmidt, Douglas H.J., P.Eng.  
 Semeschuk, Tom W., P.Eng.  
 Sexton, Edward R., P.Eng.  
 Singleton, Bryan, P.Eng.  
 Sobool, Dale R., P.Eng.  
 Stobbs, Robert A., P.Eng.  
 Strelloff, William P., P.Eng.  
 Stribrny, Martin V., P.Eng.  
 Tadros, Gamil S., P.Eng.  
 Tanner, Victor J., P.Eng.  
 Teske, David E., P.Eng.  
 Torgunrud, Brian M., P.Eng.  
 Troyer, D. Robert, P.Eng., P.Geo.  
 Turner, Christopher J., P.Eng.  
 Wade, Neil H., P.Eng.  
 Weiss-Bundy, Clifford L., P.Eng.  
 Wickenhauser, Patrick L., P.Eng.  
 Wildeman, Frederick N., P.Eng.  
 Willms, Rudolf E., P.Eng.  
 Young, Ivan W., P.Geo.

- Appointing Robert Schultz, P.Eng. as Chair of the Professional Edge Committee for a two-year term.
- Approving the amended policy Disc4.0 Publication of Discipline Committee Orders.
- Appointing Chanelle Joubert, P.Geo. to the Discipline Committee for a three-year term.
- Appointing Dr. Kevin M. Ansdell, P.Geo., FEC(Hon.), FGC as Director of Geoscientists Canada for a three-year term.
- Approving the updated Nominating Committee terms of reference.

#### **Council noted and received the following reports:**

- Registrar's reports for November and December 2016 and January 2017.
- The report on compliance activities for 2016 and January 2017.
- The unaudited financial statements for November 2016.
- Executive Committee minutes, board minutes and reports from the committees.
- Committee member appointments: Fanhau (Bill) Zeng, P.Eng. and Luigi Benedicenti, P.Eng., FEC to the Experience Review Committee; Bhaskar Mittal, P.Eng. to the Academic Review Committee; Deb Rolfes to the Professional Edge Committee; Jodi Derkach, P.Geo. to the K-12 Committee; and Grant Gingara, P.Eng., as Chair of the Discipline Committee.



# Reporting PD Credits - A Provincial Outlook

BY SEBASTIAN WALROND, P.ENG. PMP – PDC CHAIR

Last December, I attended a forum hosted by APEGS where various provincial self-regulating bodies presented their respective professional development (PD) programs and where they stand on the reporting of these activities.

We already know that nine of the 14 engineering and geoscience bodies across Canada have mandatory reporting of professional development activities but I thought we should look at our provincial environment to identify any trends with similar organizations.

The table on the next page gives a summary of where these organizations stand and it is not difficult to identify a common denominator with at least two trends.

The first trend is the establishment of a program geared to keep the membership current and up to date in that profession. As an association, we also have a clearly outlined program for professional development where members are required to obtain 80 credits annually or 240 credits over a three-year window using at least three of six categories.

The second trend is the overwhelming tendency to be transparent and have the membership report on their PD

activities. Clearly the trend that exists nationally is no different from what is taking place within our province in other self-regulated professions.

Our 2016 reporting numbers are in and not much has changed from 2015, where we continue to see only one out of four APEGS members taking the time to report their professional development credits. It seems reporting PD activities continues to be a low priority for most of our members who may not understand the risks to self-regulation this behaviour places on our association and professions.

As the regulatory body, APEGS needs to be able to confirm to its stakeholders (i.e. the public and the government) that its members are competent. APEGS is confident that members are participating appropriately in professional development activities but currently has no method of proving it. Therefore, at the request of Council, the Professional Development Committee is working on an implementation plan towards mandatory reporting and has started on an education and awareness campaign on the need for such a measure.

	Professional Development Program Requirements	Professional Development Activity Reporting Requirements	Consequences for non-compliance
Saskatchewan Institute of Agrologists	150 hours over three years or 50 hours per year using reporting categories	Mandatory to maintain good standing status	Members who haven't reported are listed in the annual roster to ISC as "Not in Good Standing"
Saskatchewan Association of Architects	70 hours over a two-year cycle	Mandatory to maintain membership	Initial fine of \$750 and being struck from registry if situation continues beyond 6 months after due date
Association of Saskatchewan Forestry Professionals	150 hours over three years using three categories	Reporting is by random audit (5% of members)	Members may be removed from the Register. PD shortfalls must be made up in addition to current requirements
CPA Saskatchewan	10 hours of verifiable and 20 total hours of PD per calendar year. 60 hours of verifiable and 120 total hours of PD per three-year rolling cycle	Mandatory	\$150 initial late fee after 30 days. Suspension after 60 days. Continued non-compliance may result in a cancellation recommendation going to the Board.
Law Society of Saskatchewan	36 hours over a three-year rolling term	Mandatory	Members are administratively suspended with a notice being issued to the profession. Members are not allowed to practice until deficiencies are resolved and a fee paid.
Saskatchewan Professional Teachers Regulatory Board	No requirements currently. Professional development is a strategic priority for this young organization formed in October 2015	N/A	N/A
Saskatchewan Association of Licensed Practical Nurses	24 hours annually	Reporting is by audit (8-10% of membership)	Initial \$500 ticket is issued to non-compliant members. Continued non-compliance is considered professional misconduct.
APEGS	80 credits per year or 240 credits over a three-year period. License waiver holders are required to obtain 30 credits per year or 90 credits over a three-year period Life members are exempt from the program.	Mandatory participation. Voluntary reporting.	Currently none



## Continuing Professional Development Details

Each year, only a tiny fraction of APEGS members report their Continuing Professional Development (CPD) requirements. This is a serious problem that undermines the integrity of our profession.

**In this new section of *The Professional Edge*, we will be spotlighting members who have made a CPD report. We're trying to make a point – it's not so hard and sometimes it can even be fun!**



**Name: Connie Barsness, P.Eng.**

**About me:** My husband and I are celebrating 20 years of marriage in 2017. We live and farm on the family farm near Weyburn. I am a mother of four boys ages 22, 17, 14, and 12. This past summer, my husband and I helped coach the canoe and kayak team (which included three of our sons) at the Estevan Summer Games. Our team

ended up winning a total of 16 medals at the games. A huge success for our team!

### **Job Responsibilities:**

I am a senior engineer at Matrix Solutions. I work with a multidisciplinary team that provides environmental consulting services primarily within the oil and gas industry. I am responsible for the remediation team at the Weyburn office. I have been fortunate over the years to work with such a dynamic and energetic group.

### **What I do for CPD:**

My activities fall in four main categories. On the formal side, I attend industry technical courses, internal training and internal short courses. Informally, I read technical journals, attend technical committee meetings and go to industry trade shows. In the presentation category, I presented a course at internal training short courses.

There is also a fun side in the participation category. I help mentor Members-in-Training at Matrix, present at career days and judge science fairs. I'm also on our school community council and have coached at the Saskatchewan Summer Games – all of which counts as continuing professional development!

### **How have your CPD activities helped you in your job:**

Within our company we have annual "Training Days" where all members from the company get together at one location and attend technical courses in their field of specialization. Senior staff members both present and attend the courses to encourage discussion. It's a great way for knowledge to be shared across the company.

Also, mentoring a Member-in-Training is a great way to increase your knowledge and competency. New members look at technical approaches with a fresh set of eyes and ask many questions. Being involved with Members-in-Training keeps me accountable to ensure that I am preparing young members to be technically competent. It's also very rewarding to see their growth and development.

# Volunteer Orientation Course

APEGS operates by the efforts of many volunteers. The Association requires new volunteers on an ongoing basis as mentors, to serve on committees, and other activities.

**What's in it for me?**

**What are my duties and responsibilities?**

**What are my time commitments?**

The Volunteer Orientation Course provides answers. All volunteers, including those considering joining a committee, are strongly encouraged to complete the course. Taken at a single sitting the course will take about 1.5 hours to complete. You may stop and resume at any time from the same device.



The Orientation Course can be found on the APEGS website, [www.apegs.ca](http://www.apegs.ca).

Go to **“About Us”** and select the **“Volunteer”** link on the left.

Visit **“On-Line Services”** and choose the committees or activities of interest to you. The Volunteer Categories can be found under **“My Details.”** The Association uses this database of volunteers as a source for new volunteers.

Don't be discouraged if you don't hear from us immediately; your turn should come up.

# Volunteering with APEGS

## What's in it for me?

- Learning or developing strengths or skills (communication, teamwork, time management, positive attitude, initiative, social, relationship, problem solving, leadership, etc.).
- Being part of your professional community and helping your profession meet its mandate, contributing to the well-being and future of your professional organization, helping define your profession, gaining the right to criticize, being a change agent.
- Satisfying personal values, giving back, fulfilling motivation to help, achieving personal growth.
- Advancing your career, boosting your career options, enhancing appeal to employers, gaining positive work references, increasing likelihood of hiring, improving salary and promotion.

## APEGS Committees

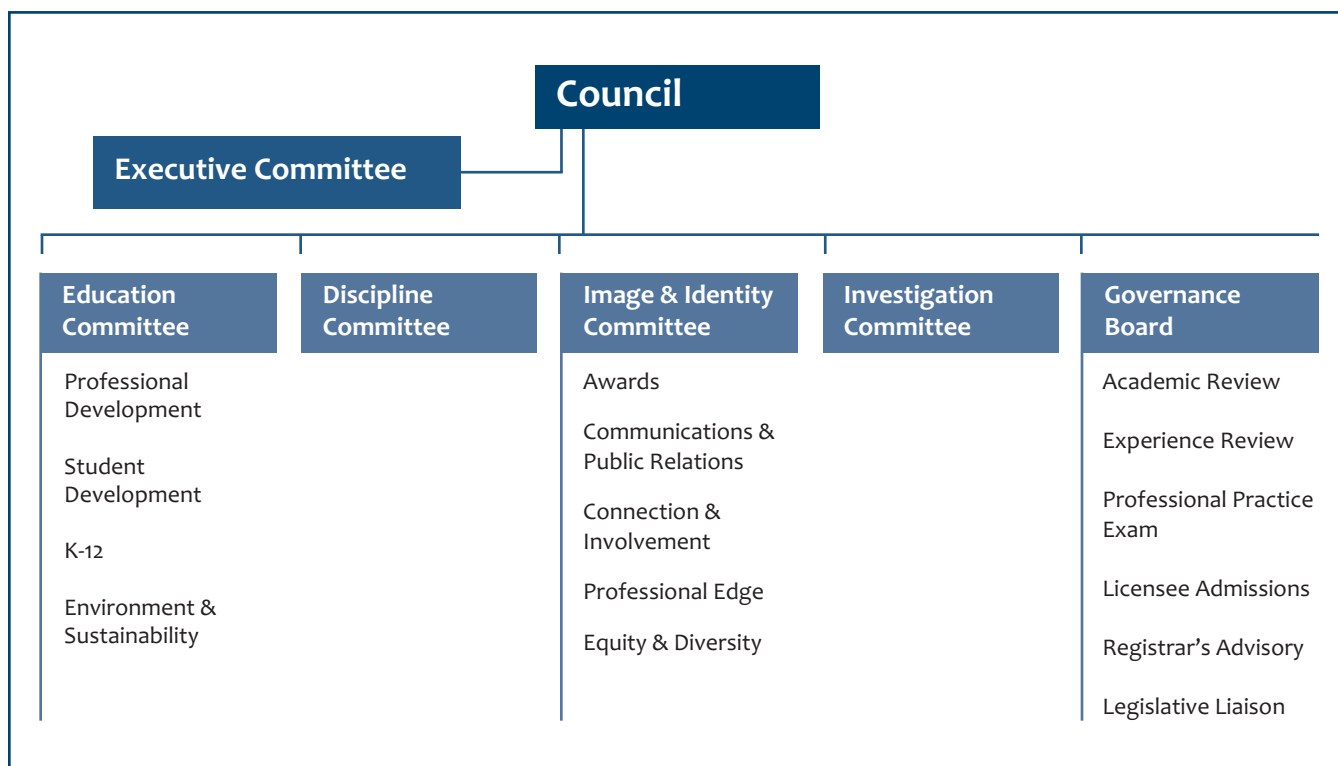
APEGS could not exist as it does without the many volunteers that make up the various committees, boards, societies and Council. These groups provide information, education, community and membership involvement and

opportunities to APEGS members as well as support the governance of APEGS. The time an individual contributes to any one committee varies, but is not more than several hours a week or month depending on the committee deliverables or extent of involvement. The accumulated volunteer hours for all of the volunteers serving on committees as a collective group is very impressive and is an important part of APEGS.

## How do I sign up?

To indicate that you might be interested in participating, enter the Online Services on the APEGS website <http://www.apegs.ca> with your user ID and password. Click on the tab “Volunteer Categories” and enter your choices. You will note that this is also where you can volunteer for one-time events, outreach activities, and indicate that you are interested in running for a Council position. This is where committees look first to find new members.

APEGS committee member term lengths are typically three years, to a maximum of six years service. Members are nominated by the committee and approved by the supervision board. Chair term lengths are typically two years, to a total maximum of six years service. Chairs are nominated by the committee and board, and approved by Council.



Safety Moment



The Health and Safety Leadership Charter

# Saskatchewan Leaders Commit to Mission: Zero

**T**he Saskatchewan Workers' Compensation Board (WCB) believes that an organization's leadership determines its safety culture. When the leader is committed to safety, the rest of the organization commits to safety. Since 2010, the WCB, through WorkSafe Saskatchewan, has invited business leaders to declare their commitment to health and safety by signing the Health and Safety Leadership Charter on behalf of their organizations.

The Health and Safety Leadership Charter is the first of its kind in Saskatchewan. Private and public sector leaders take up Mission: Zero's call to action – to eliminate all injuries. Signatories pledge to accept and encourage Mission: Zero one task at a time. They are striving to make zero injuries a reality.

Since 2010, the Charter members' time loss injury rate has dropped 38 per cent while non-Charter employers' time loss injury rate has dropped 30 per cent. During that same period, the Charter members' total injury rate dropped 29 per cent while non-Charter employers' total injury rate dropped 27 per cent. In 2015, the Leadership Charter members' time loss injury rate continued to be above the provincial rate but the signatory businesses are improving faster than the rest of the province.

These results have led to an improvement in Saskatchewan's national ranking for time loss injuries. For years Saskatchewan ranked as the second-worst in Canada for time loss injuries. According to the Association of Workers' Compensation Boards of Canada most recent ranking (based on 2015 data), Saskatchewan now ranks third highest. While Saskatchewan still has a long way to go toward achieving Mission: Zero, support from business leaders has made a significant difference.



The Health and Safety Leadership Charter provides guiding principles in health and safety. It provides the foundation for a cultural shift in the way Saskatchewan leaders view injuries and injury prevention. By signing the Leadership Charter, CEOs and business leaders agree to support seven principles:

1. Health and safety is a priority.
2. Integrate health and safety into business strategies.
3. Effectively manage risks.
4. Strive for continuous improvement.
5. Enable employee participation.
6. Extend health and safety beyond the workplace.
7. Participate in the leaders' learning community.

Charter members are investing in safety not only at work but also in the community by donating safety equipment, speaking about safety at schools, hosting breakfast meetings for other leaders and encouraging employees to take safety home. Members are also supporting local charities that are Mission: Zero partners, like the Saskatchewan Brain Injury Association, STARS, the Canadian National Institute for the Blind and Shooting Stars.

An annual Leadership Forum, co-hosted with Safe Saskatchewan, a non-profit organization committed to the prevention of unintentional injuries, provides an opportunity for business-to-business communication. Charter signatories meet to report on progress, success and outcomes. The Leadership Forum is also the annual opportunity for Saskatchewan businesses to become signatories and publicly affirm their commitment to Mission: Zero.

Changing a culture takes time but change is happening in Saskatchewan through its safety leaders. Since 2010, over 600 Saskatchewan businesses have signed the Health and Safety Leadership Charter. The number of Charter members increases every year. As time loss and total injury rates decrease, business leaders who commit to achieving Mission: Zero are changing the safety culture in Saskatchewan.

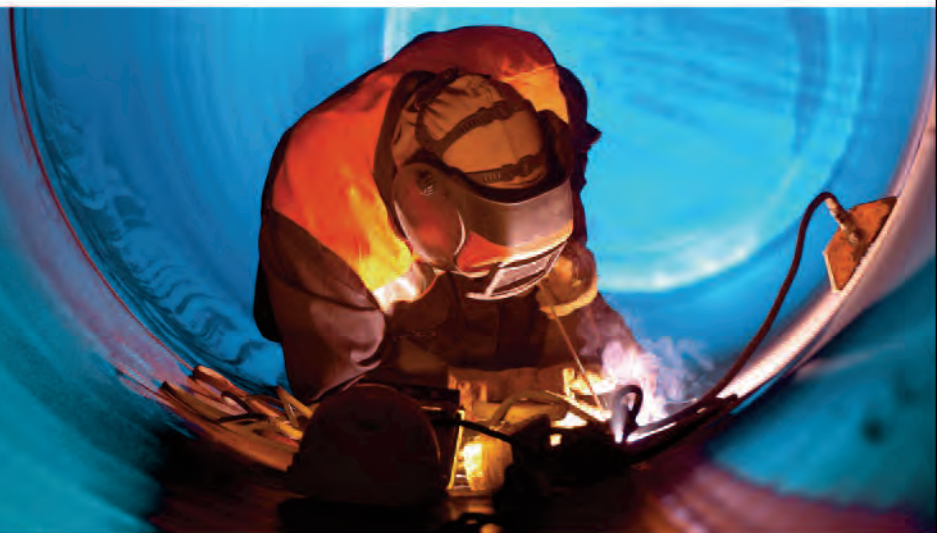
To learn more about the Saskatchewan Health and Safety Leadership Charter or attend the next annual event on June 8, 2017 in Saskatoon, please call Safe Saskatchewan at 306.352.3810 or visit the Safe Saskatchewan website at [www.safesask.com](http://www.safesask.com).

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# News Beyond Our Borders



## Light bulbs go on for students

*Welland Tribune* - As part of national Engineering Month, 13 teams of Grade 11 and 12 students built LED light banks and the batteries to power them from scratch at Niagara College.

The build was part of the third annual engineering design and build competition hosted by the Professional Engineers Ontario Niagara chapter, partnered with Niagara College and the Ontario Association of Certified Engineering Technicians and Technologists.

Lindsay Mooradian, P.Eng., a Professional Engineer involved with PEO, said students are sent a package with the information they need two weeks before the competition, which gives them time to design and even do some prototypes beforehand. On competition day, each team has a kit and they must work with the materials in it to complete their designs in a four-hour time limit.

“The main goal was to bring interest to children for engineering,” she said. “Sometimes schools don’t offer these kinds of opportunities explicitly.”

Stan Mathew, P.Eng., Chair for the PEO Niagara chapter, said the competition is growing every year and as it does it is hoped to include grade 9 and 10 students as well.

## Engineering students design refugee shelters

*Interesting Engineering* - The growing refugee crisis around the world has become not only a humanitarian crisis but an engineering one as well. One group of college seniors is working to design and engineer an affordable shelter for refugees across the world.

The engineering team at LeTourneau University in Texas has spent the last seven months trying to find the best solution for shelters for refugees in Greece. The effort is part of a national competition held jointly by John Brown University and Samaritan’s Purse. The ultimate goal of the intercollegiate competition is to find the best shelter design that can be implemented around the world.

Ten senior engineering students, varying from mechanical engineers to civil, are continually working to design two competing shelter designs for the competition. Named SafeHome, the shelter design team wants to build shelters not just to keep refugees safe but one in which that they can grow and build communities.

Specifications on how the shelters need to be designed are laid out on the competition website by John Brown University. Most notably, the shelters need to be able to accommodate a family of four with 3.5 square metres of space per person. Costs must be kept to under \$1,500 US per shelter and the completed structures will need to withstand an array of tests ranging from wind loading to seismic loading.

## Climate change leading to upgraded building codes

*Canadian Consulting Engineer* - The National Research Council (NRC), along with Infrastructure Canada, have announced they are upgrading codes, specifications, guidelines and assessment tools when it comes to Canadian buildings and infrastructure projects in reaction to the impacts of climate change and an increase in extreme weather events such as damaging floods and devastating high winds.

Over the next five years, the NRC will conduct research, evaluations, as well as risk analyses to develop new solutions to factor climate resilience into the design of future buildings and infrastructure in Canada, including houses, roads, bridges, water systems and rapid transit networks.

“With climate change, the total annual precipitation is increasing, as well as the frequency and severity of extreme events such as heat waves, high winds, floods and droughts, all of which is resulting in increased stress on built structures,” says Richard Tremblay, general manager of construction at the NRC in a release. “In 2017, it is a necessity to start planning to adapt our buildings and infrastructure to withstand the new loads.”

Once in effect, the new measures are expected to reduce the costs of rehabilitation and replacement of buildings and infrastructures affected by extreme weather events. New specifications and guidelines will be ready and released as soon as 2020.

## TECH CORNER

### Lilium aims to make personal aircraft a reality

*Engineering.com* - The idea of a flying car has captured imaginations for decades. Who wouldn't want to trade tedious trips to the airport for simply stepping out of the house and into your own private aircraft?

A startup company, hosted in a European Space Agency (ESA) business incubator, is the latest to attempt to make that dream a reality. The Lilium electric plane is designed to seat two people, fly quietly and aims to be simpler than aircraft designs today.

Daniel Wiegand, Lilium CEO and one of the company's founders, said, "We are going for a plane that can take off and land vertically and does not need the complex and expensive infrastructure of an airport. To reduce noise and pollution, we are using electric engines so it can also be used close to urban areas."

The concept has been proven with several 25-kilogram prototypes and the company is on to the next step: developing a full-size ultralight vertical takeoff and landing aircraft.

Lilium requires a takeoff area of about 15 x 15 metres and can reach flight speeds of up to 400 kilometres per hour. This is achieved by combining helicopter and fixed-wing aircraft designs with the goal of breaking away from the restrictions of taking off from airfields.

While obtaining a helicopter license is extremely expensive and time consuming, the Lilium should require a pilot licence with only 20 hours of training. The initial goal is for recreational use in the daytime in good weather conditions.

The Lilium aircraft battery is designed to recharge from any wall plug and has a range of 500 kilometres.

Of course, a high volume of these aircraft in urban areas would potentially make air travel in the city extremely dangerous. For that reason, it seems unlikely that Lilium will reach the mass market but it could be an appealing travel option for the wealthy elite.

### Engineers turn objects into FM stations

*Phys.org* - Imagine you're waiting in your car and a poster for a concert from a local band catches your eye. What if you could just tune your car to a radio station and actually listen to that band's music? Or perhaps you see the poster on the side of a bus stop. What if it could send your smart phone a link for discounted tickets or give you directions to the venue?

Going further, imagine you go for a run and your shirt can sense your perspiration and send data on your vital signs directly to your phone.



A new technique pioneered by University of Washington engineers makes these "smart" posters and clothing a reality by allowing them to communicate directly with your car's radio or your smart phone. For instance, bus stop billboards could send digital content about local attractions. A street sign could broadcast the name of an intersection or notice that it is safe to cross a street, improving accessibility for the disabled. In addition, clothing with integrated sensors could monitor vital signs and send them to a phone.

The researchers developed a new way of communication that sends information by reflecting ambient FM radio signals that are already in the air, which consumes close to zero power.

### Tiny drones: the future of pollination?

*Electronics360* - While it's common knowledge that bees are now showing up on the endangered species list in the United States, the dangers of this event may not be clear. While bees could be considered pesky critters, they do perform the important task of pollination. According to the Natural Resources Defense Council, "More than \$15 billion a year in U.S. crops are pollinated by bees, including apples, berries, cantaloupes, cucumbers, alfalfa and almonds. U.S. honey bees also produce about \$150 million in honey annually."

There's been some focus on artificial pollinators to pick up the slack for bees. For example, in Japan, researchers are working to pollinate lilies with insect-sized drones. The undersides of these artificial pollinators are coated with horse hairs and an ionic gel that's sticky enough to pick up pollen from one flower and drop it onto another. The researchers hope that their invention could someday help benefit farmers by eliminating some of the potential damage that could result from bee extinction.

Although the team's technology is not quite ready for use in the field, it is a first step toward addressing a future with fewer bees. The goal would be to decrease the stress put on bee populations by commercialization so that they can do what robots can't: make honey, while the drones take over the demands of crop pollination.

# News From The Field

## MISCELLANEOUS

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### U of S engineering grad in space program

CBC - Jason Leuschen is in good company. The University of Saskatchewan engineering graduate is on the Canadian Space Agency's short list to become Canada's newest astronaut. The Royal Canadian Air Force pilot is one of just 72 candidates in the running for the coveted job. The list was narrowed down from over 3,000 applications.

Leuschen said his love of space came early, while growing up on a farm in Bruno, Sask.

"I'd climb up to the top of the granary to watch sunsets or [go] out snowmobiling out in the dark and you'd see the entire sky almost like you were in outer space," said Leuschen.

The idea of becoming an astronaut was cemented for Leuschen after meeting Marc Garneau at the Canada-Wide Science Fair.

Next up for Leuschen is a round of physical and aptitude testing to determine if he'll advance to the next round of the process.

### U of T makes strides in gender equity

*Daily Commercial News* - Hundreds of aspiring female engineers chose to join the University of Toronto's (U of T) engineering program in the fall, making the proportion of women in its first-year class 40.1 per cent, the highest figure among engineering programs in Ontario.

"That means that U of T Engineering is starting to have a student body that reflects the world," said Dawn Britton, associate director of engineering outreach with the Faculty of Applied Science and Engineering. "We need diversity in our student body to respond to diverse questions that engineers are expected to answer and it's important that we have all voices at the table."

The first step is breaking down stereotypes and casting aside the traditional views associated with engineering, Britton explained.

"Women are tired of the stereotype that only men can be engineers and that engineering is a male-dominated profession. They're throwing that image aside and moving forward studying sciences and the maths with the same interest as their male counterparts," she said.

Women are starting to see the opportunities the profession can offer, she added.

"Women that want to go into civil engineering or construction management didn't necessarily realize that they can go and manage hundreds of people," explained Britton. "So the field has really diversified in a way that really attracts women."

Diversity and inclusivity are promoted by the university in a variety of ways. In terms of outreach, each year the faculty engages more than 10,000 elementary and secondary school students from across the Greater Toronto Area in a number of programs both on and off campus.

"U of T Engineering has outreach programs that start as early as grade 3 and we see boys and girls come to these programs but we do have an emphasis on encouraging young girls to come to our outreach programs," said Britton. "The unique piece is that we are working with current engineering students as well as alumni to deliver these programs and so that means we are putting a mentor or a role model right in front of these young people."

## UNIVERSITIES AND RESEARCH

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### Engineer to head U of S academics

*Saskatoon StarPhoenix* -The next head of academics at the University of Saskatchewan is Tony Vannelli, P.Eng. an electrical and computer engineer who spent the last 10 years running the University of Guelph's College of Engineering and Physical Science.

Vannelli, who is also a 20-year veteran of the University of Waterloo, replaces Michael Atkinson as the U of S's provost and vice-president academic effective Aug 1. His term is expected to last five years.

"My priority will be to continue aligning the strong academic mission of the university with our resources to assure



success,” Vannelli said. “This is a very collegial and collaborative university and that strength is very important to me.”

In his new role, Vannelli will serve as the university’s senior academic, planning and budget officer and be responsible for building an academic plan connected to the university’s financial decisions, the U of S said in a news release.

Vannelli earned bachelor’s and master’s degrees in mathematics from Concordia University and a Ph.D. in electrical engineering from Waterloo.



### Big dough for big science in Sask

*Saskatoon StarPhoenix* - Three University of Saskatchewan research centres have received a slice of \$328 million in federal science funding.

The total \$69-million investment “affirms the value to Canada of the world-class science being done within these unique centres,” U of S president Peter Stoicheff said.

The Canadian Light Source gets \$48 million to support research in health, the environment, materials and agriculture.

The International Vaccine Centre, which provides the infrastructure to safely study infectious diseases of animals and humans and develop vaccines, receives \$19.3 million.

Finally, \$1.56 million goes to SuperDARN Canada, a U of S-led initiative operating five radar arrays across Canada that provide continuous mapping of space weather above Canada.

“Electromagnetic storms give us the beautiful displays of the aurora borealis but they can also damage key infrastructure on earth like pipeline, power grids and satellites in space,” SuperDARN Canada director and U of S space physicist Kathryn McWilliams said in the release.

“As an essential part of a global research partnership in 10 countries, the team at the U of S helps to continuously

monitor how solar wind interacts with our planet. Interpreting this data is the first step to being able to predict and then mitigate the effects of extreme electromagnetic activity in the near space region.”

### Nasser Honoured – Again!

*U of S news release* – The College of Engineering at the University of Saskatchewan celebrated the achievements of alumnus and professor emeritus, Karim “Kay” Nasser, P. Eng., at the C.J. Mackenzie Gala of Engineering Excellence.

Each year the gala recognizes an alumnus who has achieved a position of distinction within their profession, honours their achievements by recognizing them as the evening’s Distinguished Lecturer and inducts them into the College of Engineering’s Alumni Wall of Distinction.

Nasser has a lifelong commitment to education, innovation, leadership and entrepreneurship. Born and raised in Lebanon, he earned his Bachelor of Science in Engineering at the American University in Beirut, his master’s at the University of Kansas and his Ph.D. at the U of S where he served as a professor of civil engineering for 33 years. His research led to the invention of the K-slump tester, a device that easily tests the consistency or slump of fresh concrete. The tester was used in the construction of Toronto’s CN Tower and is still widely used today.

## INFRASTRUCTURE

### Apply online applications for SK infrastructure projects

*Journal of Commerce* - The Government of Saskatchewan is now accepting online applications for infrastructure projects under both the Clean Water and Wastewater Fund (CWWF) and the Provincial Territorial Infrastructure Component (PTIC) of the New Building Canada Fund.

The CWWF, which was announced this September, will see Saskatchewan receive \$89.3 million in funding from the Government of Canada over two to three years during Phase One.

Saskatchewan has committed to providing an additional \$44.2 million for water, wastewater and stormwater projects. Eligible project costs will be funded up to 50 per cent by the federal government and 25 per cent by the provincial government, with the eligible recipient responsible for the remaining costs.

PTIC, a 10-year program announced in 2014, will see \$240.2 million in federal funding administered by Government Relations for eligible PTIC applicants. These projects are funded one-third each by the federal government, the provincial government and eligible recipients.

During the first intake of this program, more than 50 projects with total eligible costs of more than \$233.3 million were approved.

To streamline the funding process, eligible applicants will use the same online form to apply to the CWWF and the PTIC. If an applicant wishes its previous PTIC application to be considered, they will need to resubmit a new form to meet requirements.

The application form as well as information concerning program criteria and eligibility can be found at [www.saskatchewan.ca](http://www.saskatchewan.ca) under government, municipal administration and funding, finances and asset management.

## ENERGY

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### Wind project under way

*SeeNews.com* - Canadian utility Algonquin Power & Utilities Corp. has found a new location for its 177-MW wind farm in Saskatchewan with the help of the local utility.

With the change, the wind park will now seek approval to be built in the Blue Hills area in the Southwest between Herbert and Neidpath, SaskPower said.

The in-service date has been moved to 2020.

Algonquin originally planned to install up to 79 turbines near Chaplin but the \$355-million project was turned down by the Saskatchewan government because of potential negative impacts to birds and migratory corridors. This was the first wind project to undergo an environmental impact assessment in the province.

The new site for the 177-MW park has been selected in line with the guidelines established by the Saskatchewan Ministry of Environment, SaskPower noted.

Algonquin secured a 25-year power purchase agreement with SaskPower for the wind project in 2012, saying at the time that it expected to conclude construction in December 2016. The Blue Hills project will now proceed to the regulatory review permitting process.

### Auction mart smart for power

*CBC* - An online auction method is being developed at the University of Regina that would encourage people to produce green energy.

Samira Sadaoui, a professor of computer science, is



working on a method that would allow people to sell their green energy to a service provider such as SaskPower.

The idea is that during peak hours, when a power grid is seeing high use, a provider could organize an auction to buy energy from people to supplement its grid. Ideally this would avoid blackouts and put money in the pockets of residents.

The provider could buy renewable energy from a variety of sources such as wind, solar, hydro or even the energy stored in the battery of someone's electric vehicle.

Sadaoui said John McKenzie, director of strategic development for SaskPower, approached her to develop an online auction idea to meet the province's high power demand during peak hours.

The bidding would see the energy provider buy power from a combination of sellers in 15-minute increments to maximize the amount of energy for the lowest cost. The specifications would ideally ensure big wind farms couldn't undercut someone looking to make some extra cash from the solar panels on their home, for instance.

New regulations and policies would need to be in place before a system such as this could be implemented, Sadaoui said. In addition, smart metres would need to be installed throughout the province.

The auction would be held using developed software, such as an app, if it were to go ahead.

"On the consumer side, this is a very easy bidding process," Sadaoui said.

A spokesperson for SaskPower said it is something that could be considered in the future.

## URANIUM AND NUCLEAR

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### Still no funding answers for Gunnar cleanup

*Saskatoon StarPhoenix* - Deciding how much money should be committed to a massively over-budget plan to clean up an abandoned uranium mine in northern Saskatchewan



lytimg.com

has become a conundrum for all levels of government.

More than a quarter of the \$268 million earmarked to clean up the derelict Gunnar mine has been spent and most of the real work has yet to happen.

Perched on the northern shore of Lake Athabasca about 800 kilometres north of Saskatoon, the Gunnar mine operated from 1955 to 1963; a year later, it was abandoned — the mine pit was flooded and the buildings left to decay under the northern sun.

In 2006, the federal and provincial governments signed a memorandum of agreement to split the cost of cleaning up the mine — estimated at \$24.6 million — evenly. Over the next nine years, the price tag ballooned to more than a quarter of a billion dollars.

About \$30 million of the \$77.8 million spent on the project to date has gone toward demolishing asbestos-laced buildings at the deserted mine, while the remainder has covered extensive engineering and technical studies as well as site monitoring.

The environmental remediation manager at Saskatchewan Research Council which the province contracted to supervise the project, compared cleaning up Gunnar to picturing a 1,000-piece jigsaw puzzle while looking at just 10 of the pieces.

For the time being, work on the site is progressing. The Canadian Nuclear Safety Commission has removed two “hold points,” meaning workers can begin burying 4.4 million tonnes of radioactive tailings beneath more than a metre of earth.

Some preparatory work, including the establishment of roads to the all-but-inaccessible site, has been completed. The remediation work is expected to take four to six field seasons, wrapping up in 2022 at the latest.

It remains unclear who will foot the bill: The \$268 million price tag is at the centre of a long-running dispute between the provincial and federal governments, both of which declined interview requests this week.

The provincial Ministry of the Economy, which has been fronting the cost of the work, says it is working with

Natural Resources Canada — which has only advanced \$1.1 million — to “equally share remediation costs as agreed to in the memorandum.”

Natural Resources Canada contends that it agreed to pay \$12.3 million to Saskatchewan, which it says owns the site and is responsible for cleaning it up and that it will advance the remaining funds after final approvals to begin the work are issued.

Several provincial and federal politicians representing northern Saskatchewan have argued that Ottawa should contribute more to the project, as it exercised a monopoly on uranium exports for the years that Gunnar was operational.

### **Cameco cuts jobs at all levels**

*Saskatoon StarPhoenix* - Cameco Corp. says it plans to continue its cost-cutting program by eliminating a total of about 120 jobs from its McArthur River, Cigar Lake and Key Lake operations in northern Saskatchewan.

The Saskatoon-based uranium miner said the changes represent about 10 per cent of the workforce at its three major facilities in the province and that the layoffs will be complete by the end of May.

Cameco’s announcement comes less than two months after it unveiled plans to save some cash by temporarily halting production at its northern mines and mill for four weeks over the summer.

Cameco, which spent most of last year working to cut costs amid an extremely weak uranium market, said it also plans to change work schedules and air transport arrangements for its workers in the province.

The changes announced Tuesday are the latest in a long string for the company, which closed its Rabbit Lake mine at the cost of about 500 jobs and cut about per cent of its corporate workforce last year.

Uranium prices have collapsed in the years since the 2011 Fukushima Daiichi disaster. However, Cameco maintains that a recovery is on the horizon as new reactors being built around the world come online.

## **ENVIRONMENT**

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### **Manitoba and Sask at odds over flood preparations**

*CTV News* - Manitoba Premier Brian Pallister has accused the Saskatchewan government of not doing enough to fight flooding along interprovincial waterways.

Manitoba is already working with state governments in the

United States to improve flood forecasting and land-use practices that can help retain water, Pallister said, but Saskatchewan is not engaged.

Pallister said he has talked with Saskatchewan Premier Brad Wall about co-operating on flooding but Saskatchewan is "not yet at the table in a full way."

Manitoba farm groups have long accused Saskatchewan of not following proper land-drainage rules, causing spring meltwater to rush downstream along the Assiniboine River and smaller rivers into Manitoba.

The issue last came to a head in 2014, when Manitoba called in the army and declared a state of emergency as water rushed in from Saskatchewan. Some crops were washed out and about 3 800 square kilometres of farmland went unseeded.

Later that year, Manitoba put up \$50,000 to help establish the Assiniboine River Basin Commission along with North Dakota and other jurisdictions.

But Saskatchewan Environment said the blame for that year's flooding lay with Mother Nature.

The Saskatchewan government said the province works closely with Manitoba and Alberta, as well as the United States, on water management. The province also has a 2015 memorandum of understanding with Manitoba on the issue, which includes drainage.

It also announced regulations that same year along with legislation introduced in the fall to control water flow.

The Manitoba government has raised concerns about possible flooding in the coming spring, due to heavy snowfall in December and high soil moisture levels from the fall.



### **New drainage project to help flooding**

*Regina Leader-Post* - A new drainage project announced for the southeast portion of the province will allow for better control of water flows to reduce downstream flooding.

The Dry Lake Project, located within the Gooseberry Lake watershed, is a single permit issued to 73 landowners for

more than 18,000 acres of an organized and responsibly managed drainage network — making it the largest drainage project in provincial history.

The project includes 30 gates which will be able to hold back water at certain times when the river volume is high to allow it to recede and release the water when it is safe to do so.

The project is unique given the number of landowners on a single permit. Previously each landowner would have had to apply for three permits for the drainage — a permit to construct, a permit to operate and an aquatic habitat protection permit.

Over the last few years, the drainage laws in Saskatchewan have changed to combat illegal drainage. In 2015 the laws were changed to streamline the application approval process and remove exemptions for drainage works constructed before 1981 from requiring an approval. Last year, changes were made to focus on ensuring projects are permitted when they have downstream landowner permission to drain and are draining into an adequate outlet.

The Water Security Agency is currently working with hundreds of other landowners on an additional 12 organized drainage projects making up more than 160,000 acres.

### **Unity has high hopes for waste water treatment technology**

*Marketwired release* - The Town of Unity has fired up a first-of-its-kind-in-Canada wastewater treatment system and they have high hopes for the technology. In fact, the community's administration believes that the results of the treatment system will surpass the "release of water to a fish-bearing environment" standards.

Two of the wastewater treatment systems were installed at Unity the end of 2016. and the systems went online January 11, 2017.

Unity began their search for a new wastewater treatment solution when they were told by the province of Saskatchewan that their current wastewater system could support 2,500 residents. Faced with the prospect of positive growth in the near future, the town then spent 18 months researching options. They finally settled on an Australian technology.

The town council settled on the wastewater treatment system, primarily due to economics. They stated that this was the most financially viable of all the options but added that the system is appealing for other reasons as well — mainly its small footprint and ease of use.

The two units will now run as a pilot project until they are approved by the Water Security Agency.



## OIL AND GAS

### Oil's well again

*Regina Leader-Post* - In the snowy prairies of Western Canada, not even temperatures below -40 degrees have stopped Stampede Drilling Ltd.'s 60 recently rehired workers from manning the oil-service provider's rigs after a nine-month dry spell for the business.

"Once oil hit \$50, everybody started phoning again," said Bill Devins, the drilling company's 57-year-old owner.

From the tight-oil plays of Saskatchewan to the oil sands of northern Alberta, Canada's energy producers are returning to growth mode after more than two years enduring the worst market rout in decades. They are leaner and more efficient after cutting staff, shelving projects and reducing costs since the downturn. Cheaper crude doesn't feel so painful any longer.

Companies such as MEG Energy Corp., Canadian Natural Resource Ltd., Cenovus Energy Inc., Encana Corp. and Seven Generations Energy Ltd. have all announced plans to expand production. Calgary-based Precision Drilling Corp. hired and recalled about 1,000 field workers to reactivate rigs in Canada and the US.

The renewed focus on expansion happens as the Organization of Petroleum Exporting Countries cuts output and after the Canadian government in November approved construction of two expanded oil pipelines that will add almost a million barrels a day of export capacity to Western Canada.

To be sure, the economy is only beginning to recover. In Alberta, holder of the world's third-largest crude reserves, the unemployment rate dropped to 8.5 per cent last month from 9 per cent in November, the highest in more than 20 years.

Much of the growth will be concentrated in Saskatchewan, where a less challenging geology means more wells will be tapped this year than in Alberta, according to the Canadian

Association of Oilwell Drilling Contractors and Petroleum Services Association of Canada. That's good news for Stampede's Devins, who's watched people move away and local businesses close up including a Staples and a motel. The new year has started out good.

"It's probably as active as we've seen in two years for sure," he said.



austindiamondbuyer.net

### Next step in diamond development

*Saskatoon StarPhoenix* - The provincial government's decision to commit \$137,000 to fund consultations with a Saskatchewan First Nation means Shore Gold Inc. is one step away from learning whether its proposed Star-Orion-South diamond mine east of Prince Albert can proceed as planned.

The talks between the Ministry of Environment and James Smith Cree Nation are expected to take about six months and concentrate on issues related to land access for traditional activities like hunting and fishing, according to a government spokesman.

"Once consultations with James Smith Cree Nation are deemed adequate, then the minister will evaluate all pertinent information before rendering a decision," said Brady Pollock, applications manager in the ministry's environmental assessment and stewardship division.

Pollock said the government decided to undertake the latest round of consultations after a public review process completed two years ago raised "issues that had not been addressed".

Shore Gold has been trying for years to get approval for the mine. It submitted its environmental impact statement to provincial and federal regulators in 2010 and received feedback from both, as well as First Nations, between 2011 and 2014.

Pollock defended the government's timeline. He said other projects in untouched northern areas have taken as long to approve and that the Shore Gold project's size and location in the Fort à la Corne forest made for "a lot of complexities."

Shore Gold began looking for diamonds in Saskatchewan in 1995. In 2011, it estimated the mine would cost \$2.5 billion to build. Shore Gold said last year it was working to dramatically reduce its capital costs.

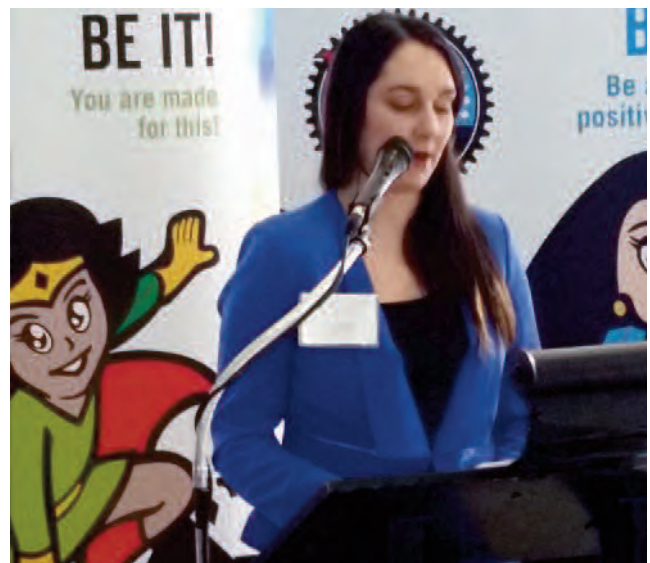
# Dream Big: Engineering Our World



Saskatchewan Science Center Executive Director Sandy Baumgartner

In Regina on February 17 at the Saskatchewan Science Centre IMAX theatre, APEGS participated in the launch of a new IMAX film, “*Dream Big: Engineering Our World*”. The APEGS 30 by 30 Task Group also took the opportunity to publicly announce their Initiative aimed at increasing the number of newly licensed engineers in Saskatchewan who are women to 30 per cent by 2030.

The screening was attended by dignitaries from the provincial and federal government. Attendees were treated to a full screening of the movie – complete with popcorn, drinks and souvenirs.



Engineering student Nicole Barber brings greetings



APEGS 30 by 30 Task Group Chair Margaret Anne Hodges, P.Eng., FEC talks to local media



# REGINA 2017

# Call for Judges

## Event

- Canada's top 500 young engineers & scientists (in grades 7-12/Cégep)
- inspiring projects – the best are master's degree level
- \$1M in medals, scholarships, awards, & experiences

## Need

- engineers and scientists from all disciplines
- bilingual French/English engineers and scientists
- engineers and scientists from academia, industry and government

## Qualifications

- PhD, PEng, MD or equivalent
- MSc, MASc or equivalent with 4 years experience in the field
- BSc, BASc or equivalent with 6 years experience in the field
- graduate students with science fair judging experience
- undergraduate students are not eligible

## To register

Email [chief.judge@youthscience.ca](mailto:chief.judge@youthscience.ca)

May 15-16 • University of Regina  
[cwsf.youthscience.ca](http://cwsf.youthscience.ca)  
[chief.judge@youthscience.ca](mailto:chief.judge@youthscience.ca)

# Calendar Of Events



## **2015 Building Code Adoption Workshop**

April 18, 2017

Regina, SK

[saskatchewan.ca/buildingstandards](http://saskatchewan.ca/buildingstandards)

## **2015 Building Code Adoption Workshop**

April 20, 2017

Saskatoon, SK

[saskatchewan.ca/buildingstandards](http://saskatchewan.ca/buildingstandards)

## **Law and Ethics Seminar**

April 21-22, 2017

Saskatoon, SK

[www.apegs.ca](http://www.apegs.ca)

## **Canadian Institute of Mining, Metallurgy and Petroleum (CIM) 2017 Convention**

April 30-May 3, 2017

Montreal, QC

[www.convention.cim.org](http://www.convention.cim.org)

## **Williston Basin Petroleum Conference**

May 2 - 4, 2017

Regina SK

[www.wbpc.ca](http://www.wbpc.ca)

## **APEGS Annual Meeting**

May 4-6, 2017

Regina, SK

[www.apegs.ca](http://www.apegs.ca)

## **WinSETT Leadership Workshop**

May 5, 2017

Vancouver, BC

[bit.ly/2hkcmVi](http://bit.ly/2hkcmVi)

## **Building Standards - Legislative Framework Workshop**

May 8-9, 2017

Saskatoon, SK

[saskatchewan.ca/buildingstandards](http://saskatchewan.ca/buildingstandards)

## **CSSE 2017 Annual Meeting and Awards**

May 12-13, 2017

Regina, SK

[seniorengineers.ca/csse/csse-2017-awards-dinner/](http://seniorengineers.ca/csse/csse-2017-awards-dinner/)

## **Regina Engineering Society Horizon's Dinner**

May 15, 2017

Regina SK

[www.reginaengineeringsociety.com](http://www.reginaengineeringsociety.com)

## **Professional Practice Exam**

May 27, 2017

Regina and Saskatoon

[www.apegs.ca](http://www.apegs.ca)

## **RFG 2018 Conference - Energy, Minerals, Water, Earth**

June 16, 2018

Vancouver, BC

[www.rfg2018.org](http://www.rfg2018.org)

## **Food, Fuel and Fibre for a Sustainable Future**

August 6-10, 2017

Winnipeg, MB

[www.csbe-scgab.ca/winnipeg2017](http://www.csbe-scgab.ca/winnipeg2017)

## **2017 Canadian Utilities & Critical Infrastructure Information & Communications Technology Conference**

September 26- 28, 2017

Regina, SK

[utc.org/canada/canadian-utility-telecom-conference](http://utc.org/canada/canadian-utility-telecom-conference)

## **APEGS Fall Professional Development Days**

October 16-17, 2017

Regina SK

[www.apegs.ca](http://www.apegs.ca)