THE PROFESSIONAL

EDGE

ISSUE 149 MARCH/APRIL 2014

Sustainability

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President Dwayne A. Gelowitz, P.Eng., FEC

Sustainability is the theme of the current issue of the *Edge*. As professional engineers and geoscientists, we are obligated to protect the environment in our daily activities.

Paul Hawken, an entrepreneur, environmental activist and author stated, "The first rule of sustainability is to align with natural forces, or at least not try to defy them." With our impact on the economy and our technical knowledge and understanding, we are in a great position to explore and implement practical, sustainable solutions for the needs of society.

Engineers and geoscientists have been at the forefront of promoting the need for sustainability and exploring opportunities to incorporate it. We have to continue to develop and refine sustainable practices so that they make business sense to our employers and clients. This will encourage their adoption and change the industry standard in the process.

Sustainability can be advanced in many ways, including recycling and reuse of materials, use of renewable energy, LEED design of buildings and carbon capture and storage, among many others. Every action, small and large, has an impact on preserving the planet for future generations.

Please refer to the articles included in this issue and think about ways that we can improve upon our own sustainability practices, both personally and professionally.

It is hard to believe that this is my final president's message. Serving APEGS and its members over the past year has been a great honour and privilege. The year as president has been very fulfilling, with many opportunities to travel, meet interesting people, address challenges and participate in stimulating debates about the management and regulation of the professions. This would not have been possible without the support of so many people.

I would like to acknowledge my employer, Stantec, for permitting me the opportunity to serve on APEGS executive throughout my four-year term, and my co-workers for supporting me and covering for me during my absences from the office.

A great deal of support has also been provided to me by APEGS executive, Council, past presidents and staff who were there to encourage and guide me throughout the past year. A special thank you is extended to Dennis and Wendy Paddock for their assistance to Donna and me during all of the travel and events throughout the year.

Lastly, I want to thank my family for their support. Thank you to our children for putting up with our absences from home and for the taxi service to and from the airport. Thank you to Donna for putting her life and career on hold to accompany me to the many events and destinations across the country. You made fulfilling my obligations during the year much more enjoyable.

It has been my pleasure to represent our outstanding organization and I wish Andrew and Margaret Anne both many successes during each of their upcoming years as president.

Have a great day!

Dwayne A. Gelowitz, P.Eng., FEC
President

SUSTAINABILITY

What is sustainability?

That's the question we examine in this issue of *The Professional Edge.*

Terms like "sustainability" and "sustainable development" have become common buzz phrases throughout the engineering and geoscience professions. They are used in many different contexts – environmental policy, energy policy, construction codes and resource development, to name a few.

The terms have come to be applied to so many things that their exact meaning is sometimes hard to determine. A quick scan of websites touting "sustainable development" projects will reveal that the term does not always necessarily stick to the strict dictionary definition of "sustainable" (i.e. "able to be used without ever being completely used up or destroyed").

For example, can a mine project really be called "sustainable" in the fullest sense of the word? After all, a non-renewable resource, by definition, will eventually run out.

To confuse matters further, some experts mark a distinction between general sustainability (which includes economic and socio-political concepts) and "green development," a purely environmental take on sustainability. In fact, environmental concerns make up only one component of the Earth Charter, the founding document of the international sustainability movement (*see sidebar*).

Nonetheless, it is clear that sustainability has become an increasingly important organizing concept in modern engineering and geoscience work. While it may mean different things to different people, within the professions the term appears to generally apply to these situations:

- **Practices that reduce harm to the environment**
- **Practices aimed at reducing, reusing and recycling materials.**
- **Renewable energy development**

In this issue, we will look at projects around Saskatchewan that fall into these categories of the sustainability concept.

The Earth Charter

The Earth Charter is considered to be the founding document of the sustainability movement. The Earth Charter project began as a United Nations initiative, but it was carried forward and completed by a global civil society initiative. The Earth Charter was finalized and then launched as a people's charter in 2000 by the Earth Charter Commission, an independent international entity.

It focused on four equally important pillars:

- **Respect and care for the community of life**
- **Ecological integrity**
- **Social and economic justice**
- **Democracy, non-violence, and peace**

For more information on the Earth Charter, visit www.earthcharterinaction.org

Forestry Centre in Prince Albert, a LEED certified building. **Photo courtesy of aodbt.**

Taking the LEED

When people think of greenhouse gas emissions, they usually think of the stuff coming out of the tailpipes of cars or out of large industrial plants. However, one of the most significant sources of greenhouse gas emissions is a group of objects that don't move at all.

Buildings account for up to 35 per cent of greenhouse gas emissions in Canada, as well as being generators of huge amounts of other waste material.

In our modern, environment-conscious age, buildings are coming under increasing scrutiny. The most common voluntary assessment for environmental performance is Leadership in Energy and Environmental Design (LEED). Since its founding in 1998, LEED has taken the world by storm, spreading to over 132 countries where it has quickly become the gold standard of environmental design.

In Canada, the job of overseeing LEED standards is handled by the Canada Green Building Council (CaGBC), a non-profit organization with chapters across the country.

Mitch Strocen, P.Eng. is an active member of the Saskatchewan chapter and the sustainable design lead for aodbt architecture + interior design.

"The great thing about the LEED rating system is that it forces you to take a global view of a building. It isn't just about energy use or energy savings, although those building sites are of course very important. LEED examines things like air quality, water use and materials. It's not just about environmental impact but also about making the building a better place to work and live."

An example Strocen cites is the LEED focus on the ongoing internal operations of a building.

"We examine things like air quality, lighting, volatile organic compounds and carbon access to natural light. We even get right down to considering the number of thermostats – if you have one thermostat for 40 people, you're never going to make everyone happy. There have been any number of studies that have shown that workplace morale and productivity can be increased by simple things like natural light and ventilation systems that provide fresh air."

According to Strocen, the LEED planning process starts before a building site is even chosen.

"LEED is basically a credits system so a building owner or developer can get points for certain things to balance off deficiencies in others. For example, LEED takes into consideration the location of the building. What sort of transportation is needed to get there? Can it be accessed by public transit? If a developer has a choice of locations, those are things they may want to consider."

But Strocen and his colleagues are careful to avoid gimmicks.

"There are innumerable ways a building can earn extra credits but many of them won't really make sense for that building. We don't get into the game of chasing credits just for the sake of getting credits. We only recommend measures that are truly useful and make sense for the client and the project."

Although originally developed for new commercial buildings, LEED has steadily expanded to cover almost every conceivable building-related situation.

"There is now a LEED model for homes. There are standards for retrofits and maintenance of existing buildings. Down in the US, LEED has become refined down to particular types of buildings, like schools."

Although many members of CaGBC are engineers, the LEED standard covers many other professions including architects, contractors and designers. The Saskatchewan chapter has trained and educated hundreds of members since its founding in 2006.

Interest in LEED has grown steadily in the province. Although the standard is voluntary, many organizations, including provincial ministries, the universities and the City of Saskatoon, have mandated LEED standards.

With the growing appetite around the province for LEED certification, engineering, architectural and construction firms have responded by getting an increasing number of staff LEED accredited. According to Strocen, his company

aodbt Saskatoon, a LEED Silver certified building. Photo courtesy of aodbt.

strives to take a leadership role in sustainable design and currently has 15 accredited staff.

"It's great to work in that sort of environment. We are all pulling in the same direction so there's no pulling teeth to get a standard implemented. We all work together to try to find credits that will work for the client and that aren't cost-prohibitive."

Nonetheless, the province on a per capita basis has lagged behind other jurisdiction in LEED certified projects and personnel. To Strocen, this is partly because the building standards are already very high in Saskatchewan.

"As a function of our climate, Saskatchewan buildings have always been very energy-efficient. We can hold heads high that we've done some unique things out of necessity that are just now coming into the mainstream in other places."

"Really, when you look around at some of the innovation that's gone on in the province, it's clear that the LEED perspective comes pretty naturally to Saskatchewan engineers even if they have no formal LEED training. As part of their normal professional ethics, they just do the right thing and don't chase recognition. It's the Saskatchewan way."

Cowessess site project focuses on improving reliability and predictability of wind power. Photo courtesy SRC.

Windspeakers

Legend has it that the Great Law of the Iroquois required all tribal decisions to consider consequences seven generations into the future. It's no surprise, then, that sustainable energy holds a great appeal to modern First Nations. In March, 2013 the Cowessess First Nation commissioned an experimental wind energy project whose implications could be felt around the world.

The Cowessess 800 kilowatt ENERCON wind turbine, installed in collaboration with the Saskatchewan Research Council (SRC), serves as a revenue source for the First Nation thanks to a power purchase agreement with SaskPower. For SRC, it is an important experimental research station.

The Cowessess turbine, located four kilometers east of Regina, is obviously not the first wind energy project in Saskatchewan. The Canadian Wind Energy Association lists four full-scale commercial wind energy producers plus a number of small producers and experimental projects.

What makes the Cowessess project unique is that it is tackling a persistent problem that has bedevilled wind power: predictability.

"The winds blow fairly consistently over a year, but on a day-to-day or minute-to-minute basis there is considerable volatility which makes wind power unreliable," says Mike Sulatisky, P.Eng., and principal research engineer at SRC.

The Cowessess High Wind and Storage Project is one of the first in North America and perhaps in the world to include a 400 kilowatt lithium-ion battery system with 744 kWh of energy storage aimed at smoothing out the volatility of wind power.

"There are a couple of main terms we use: smoothening and firming. With smoothening, we try to address the extreme short-term volatility of wind. A single turbine can go from producing 100 kilowatts to 700 kilowatts in less than five minutes. That's like having 150 homes turning on every electrical device which could be pretty rough on the electrical grid. So, we are looking for ways to reduce the effects of those surges," says associate research engineer Ryan Jansen, P.Eng. at SRC.

"The other side of that is firming – making sure the power is there when it's needed because the wind won't necessarily be blowing when the consumers are looking for power," says Jansen.

According to Jansen, SRC has already made significant headway with its battery experiments.

"Power companies assess turbines on the basis of how much power they can reliably deliver, which is typically in the range of 25 per cent. That means an 800 kilowatt turbine is actually judged to be a 200 kilowatt power producer. The battery can increase this to 50 per cent or 400 kW," says Jansen.

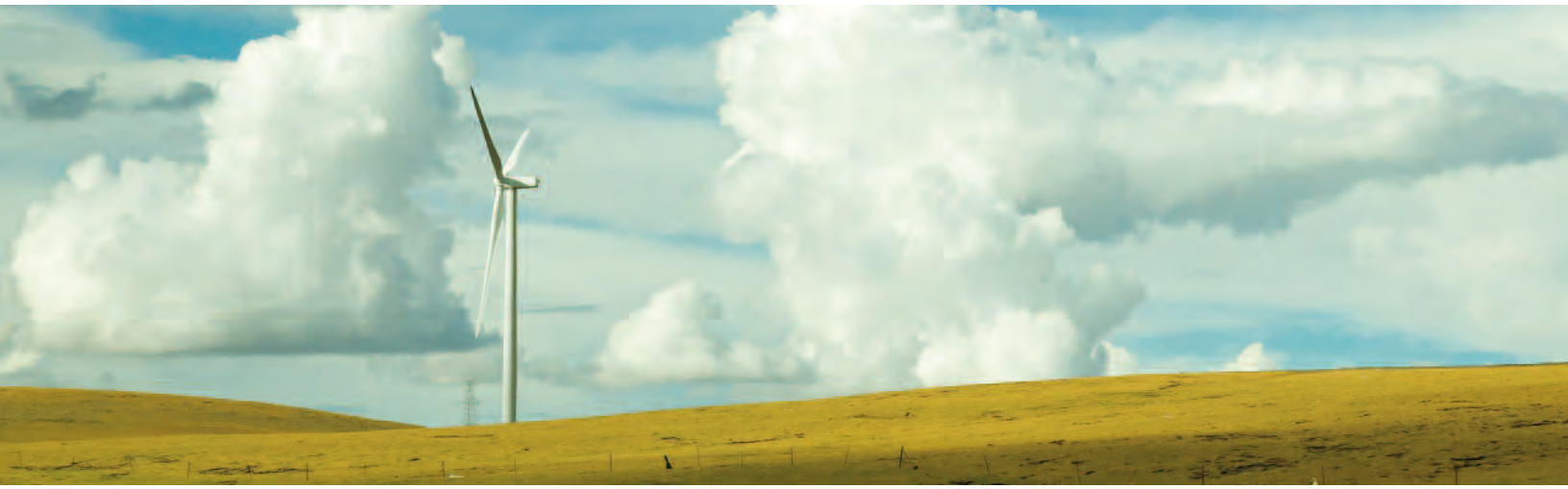
Jansen believes that their experiments may be almost unique in the world, and are important in understanding the abilities of the combined wind-battery system.

"There are only a couple of other projects around the world focused on smoothening and firming. In Canada, a group in Prince Edward Island are working on a wind turbine with storage design but they haven't built it yet. We may very well be the only ones breaking ground on this type of storage system in Canada," says Jansen.

Cracking the code on wind energy's reliability problems would have huge implications for the entire industry, such as reliably increasing the penetration of wind energy onto the grid but for now the SRC team is focused on shorter-term applications.

"Right now, we are still just in the demonstration stage. We are looking for ways to extend the project, perhaps by adding a solar array to the site because there would definitely be value in researching a wind-solar-battery application. Beyond that, I think this technology would have applications for remote communities or other areas where power fluctuations and energy reliability are concerns," says Jansen.

"It's fun to work on something that could potentially do some real good for the world in the near future."



First Nations Power

The Cowessess wind turbine is only one example of Saskatchewan First Nations' interest in renewable energy projects.

First Nations Power Authority of Saskatchewan (FNPA) is a not-for-profit organization created in 2011 to assist First Nations-led power projects and to help connect First Nations with procurement opportunities with SaskPower.

FNPA has signed a master agreement with SaskPower, setting out the process for developing First Nations power projects. FNPA is in the midst of working out its first 10-megawatt power project, although details of this project are currently confidential.

A pre-existing project that falls partially under the umbrella of FNPA is the Meadow Lake Tribal Council's (MLTC) biomass power plant. This 36-megawatt plant runs on residue from MLTC's neighbouring forest products company. MLTC and FNPA closely work together closely to share information about the energy sector.

Ben Voss, P.Eng. heads up both organizations.

"In many ways, FNPA evolved out of the biomass project. Our team at MLTC was working on our own project which included a power purchase agreement with SaskPower. That led us to have discussions with the province about how we could expand on this model to create opportunities for other First Nations," Voss says.

Voss confirms that, from his experience, First Nations are particularly eager to support renewable energy.

"First Nations communities really do have a high respect for things related to Mother Nature. These projects fit well with their culture and outlooks."

With backgrounds in both business and engineering, Voss has been uniquely suited to oversee these projects.

"Being able to wear both hats has been a great advantage for me. Naturally, these sorts of projects require both a great deal of technical skill and business acumen. I've been able to draw on my networks in both fields to help determine what proposals are viable and which aren't."

According to Voss, power projects offer not only economic development and long-term revenue for First Nations but may also help inspire First Nations students to pursue careers in the science professions.

"The challenge of getting First Nations students interested in science lies with education. The kids themselves just naturally have an interest in technology, alternative energy and the environment. The opportunities are there; we just need to make students aware of them. I think FNPA can play a part in connecting the dots between interest and opportunity by providing more positive role models who show how science careers can make a difference in the world."

The Papa Bravo Marmot.
Photo courtesy Papa Bravo Innovations.

Make Mine Electric

If you think that all electric vehicles are dinky commuter cars and scooters, think again. Saskatoon-based Papa Bravo is taking the mining industry by storm with its line of heavy-duty trucks and carts that prove that "tough" and "environmentally friendly" are two phrases that can go together.

Since delivering its first prototype vehicle just four years ago, Papa Bravo has been on a fast track to become a global leader in electric vehicle innovation.

Build a Better Mousetrap

The company started as little more than a hobby project by president Patrick Byrns. In 2008, Byrns – who had previously worked in the custom fabricating business – decided to build his own electric truck. The result was an unqualified success.

"The first thing everyone asks about electric vehicles is the range. Around the company, we call that "range anxiety." Patrick's first truck turned that anxiety on its head. His truck, which he still drives summer and winter, has a range of 130 kilometres on a charge," says Dave Cote, Engineer-in-Training, manager of engineering and R&D at Papa Bravo.

"Once you get into the habit of plugging in one of our electric vehicles regularly, you start to develop an opposite feeling: fuel anxiety. If you switch back to a fossil fuel vehicle, you become anxious about running out of fuel because you can't just stop and plug it in like your electric vehicle."

The old cliché about 'build a better mousetrap and the world will beat a path to your door" doesn't always hold true, but it did in Byrns's case. Managers at the PCS Cory mine heard about his invention and approached him to build a custom prototype vehicle for use in the mines. By 2010, Byrns delivered the Gofer, an all-electric utility vehicle with a quarter-ton hauling capacity and designed specifically for underground work in potash mines.

Today, Papa Bravo supplies underground hauling and transportation vehicles for many potash mines in Saskatchewan.

Advantages for Mining

Since the Gofer, Papa Bravo has been busy inventing a suite of other vehicles, known as the Badger line, suited to a range of applications such as equipment hauling and crew transportation. Papa Bravo's vehicles help solve a number of pain points for the mining industry.

"The biggest thing is air quality. Diesel vehicles create obvious ventilation problems when you are in an enclosed space," says Cote.

Electric vehicles also cut down on the need for hauling fuel down into the mine as well reducing the accompanying fire hazard.

According to Cote, there is also a significant difference in the levels of maintenance required between diesel and electric vehicles.

"Conventional diesel mine vehicles have manual transmissions that tend to suffer a lot of abuse – users grinding gears or slipping the clutch when ramping up to full speed, for example. The gear box on an electric vehicle has many fewer points of failure and is designed to accelerate on a programmed curve."

Not to be forgotten is the cost savings on fuel. Cote estimates that the cost of charging an electric truck is roughly 20 per cent the fuel costs for a conventional vehicle.

Range on the Radar

Cote says that, at the lower speed limits typical in a mine, a Badger vehicle can go for four hours straight on a single charge.

"Of course, you would never drive a mine vehicle for an extended time like that. It's mostly stop-and-go over short distances. Even so, our customers can eliminate any range anxiety just by making sure to plug in the vehicles during lunch breaks and shift changes."

Plugged into a high power outlet, the Badger vehicles can recharge in about an hour. Papa Bravo has also developed flash-charge refuelling stations that can bring a battery up to about a half-charge in a few minutes.

"Although we can do this, there hasn't been much call for it. The flash chargers are hard on the batteries and they aren't really necessary since there are so many other opportunities during the workday for conventional charging."

Rich Man's Lego

A clever part of the Badger's design is that the parts are completely interchangeable among the six models. This not only makes maintenance much cheaper and easier but also means that any Badger model can be reconfigured to become another model.

"As one client said to me in a meeting. This is really just a rich man's Lego set, isn't it?""

Next Steps

Papa Bravo has sold about 80 vehicles to date and has started expanding into other potash mines in the province. The company's innovations have also quickly earned it attention from around the world.

"We get calls all the time from Australia, Europe, Africa, South America. There aren't very many companies in the world that have figured out this technology but mining companies are eager to get their hands on it. Most of these aren't potash miners so unfortunately we have to tell them that the Badger is not right for them."

Papa Bravo's Badger-EV141.
Photo courtesy Papa Bravo Innovations.

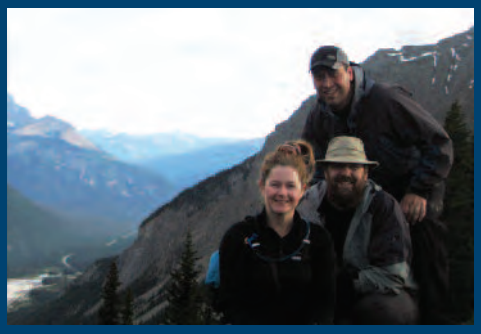
For this reason, the company is finalizing designs for its next generation of vehicles, the Marmot line which will be engineered to work in the tighter spaces, steeper ramps and uneven surfaces of other types of mines, as well as being suited to work above ground.

"Once we get into production, we expect sales of the Marmot to completely eclipse those of the Badger."

But what about the rest of us? Could Papa Bravo ever make Saskatchewan the Detroit North of electric passenger vehicles?

"We get asked that all the time. We are often approached both by companies and individuals to create custom electric or hybrid conversion vehicles. In the long term, we'd like to start a division focused on that. For now, we just don't have the capacity to do that. We are running flat out to try to keep up with the demand in the mining industry."

Member Profile



This month *The Professional Edge* chats with Taryn Strocen, P.Eng., senior mechanical engineer for AMEC in Saskatoon.

Tell us about your personal and professional background.

I was born in Regina but we moved around Canada quite a bit when I was a kid. Eventually, we ended up in Saskatoon where I went to university.

Was it tough moving around so much when you were growing up?

You get used to it. It's an advantage in some ways. You learn to interact with everybody and to get along with whatever group of people you happen to be around at the time.

Why did you choose to go into engineering?

I've always loved science and math, and I knew I'd do something technical. My high school calculus teacher was the first one to suggest I become an engineer. I told him that I didn't think I wanted to drive trains.

Right out of high school, I actually registered into commerce since it seemed like the place to be if you were good in math, but I pulled out and took a year off to think about the direction of my life. I worked as a housekeeper at a mountain lodge in Kananaskis. I did lots of hiking which I really enjoyed, but the downhill skiing led me to the realization that I'm a flatlander by nature.

Did you have any challenges at university after taking the year off?

Surprisingly, no. It was easier to concentrate on school work and have the drive to do well when you know that you are doing something you really want to. During my year off I had researched the careers available, and found that engineering (not the train-driving kind) was something that I was interested in. In university, I fell in with a good group of friends who studied together and supported each other. For my first two years of school, I paid for my education using the savings I had accumulated from my year off, plus money from a part-time job. The job ended up being a big distraction from my studies. After that I managed to get a line of credit from the bank that I managed to pay off every year. Summer jobs for engineering students pay well, you know.

My first exposure to real-life engineering was my first summer job in the mechanic shop at the Coop Refinery in Regina. I really enjoyed working in this atmosphere – and the guys in the shop gave me great examples of how bad equipment design or layout affects the end user. I think having an open and friendly personality helped with fitting in with this group and getting the most out of the experience.

Where did you go after college?

Back then, there weren't a lot of opportunities in Saskatchewan so, like many engineering graduates, I moved to Alberta. My first job outside Saskatchewan was as a production engineer with Husky Energy. I had worked for them before as an intern so I was lucky that I had the job waiting for me.

After a few years, we decided to move back to Saskatchewan for family reasons. Our families were all here, plus Saskatoon is such a gorgeous city. Another plus to a smaller city is the minimal time required for the commute to work. I can be home in 15 minutes with plenty of time to enjoy the evening. That was back in 2004. Things were still tough that year and many of our friends thought we were crazy. But the very next year things started to take off and those same friends wondered how we knew that Saskatoon would get so "hot".

Of course, we didn't know. I was taking a big chance coming here with no job waiting for me. Fortunately, I managed to get my foot in the door with a manufacturing facility that makes

equipment for potash mines. I was with them for a few months when AMEC had a posting for engineers to help with two large potash mine expansions that they were working on. They took a chance on me even though all my experience was in oil and gas. I've been working in potash ever since.

What do you feel has been your single greatest accomplishment so far as an engineer?

Because I actually enjoy what I do, I put a lot of heart into my work and am proud of what I do. If I had to pick one thing, it would be my current work at AMEC – aside from my roles on projects such as a project engineer, I am also the second-in-command of the Mechanical department, part of the management team, a quality champion, part of various leadership teams and a mentor to so many of our great Engineers-in-Training. It seems that the opportunities keep coming and the sky is the limit with this company. They truly appreciate the work I do for them. I was also lucky that Saskatoon had boomed at the perfect time and the opportunities were available for me.

What are your interests outside of work?

You mean before kids? I used to be into all sorts of sports – frisbee, curling, softball, soccer, volleyball, you name it.

These days, of course, my free time is pretty much all focused on my kids, but I can usually squeeze in a bit of cross-country skiing or golfing, depending on the season. The one thing I still love to do is backpacking in the mountains. So far we have only done trips throughout the Canadian Rockies. Last year we celebrated our anniversary in Yoho National Park on the Iceline Trail.

Have you ever met anyone famous?

Back when we lived in Calgary, Miikka Kiprusoff, the goalie for Calgary Flames, lived in the same condo building as we did. That was in the days of "the Red Mile" on 17th Avenue when the fans would get really wound up after the games. We would often see him or other Flames players in the elevator.

What is your favourite vacation spot?

We do lots of Canadian vacations and we have a goal to see every province. But my favourite place is Hawaii – Maui in particular. I would go back there any time. The climate is just right – sunny and warm but not too hot. When we were there, it was always easy to find something active to do: boogey boarding, hiking, swimming. We didn't get to do everything we wanted so I'd love to go back.

ensuring public safety

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Steve Jacobs, P.Eng. | Yaomin Jin, P.Eng. | Salim Kadiwala, M.A.Sc. P.Eng. | Geoff Kallweit, P.Eng. | Md Kamruzzaman, P.Eng. | Georges Kipouros, P.Eng. | Megan Krienke, P.Eng. | Sanjay Kumar, P.Eng. | Pawan Kundra, P.Eng. | Paramjit Lammay, P.Eng. | Andrea Landell, P.Eng.

meet the challenges of environmental sustainability and protect public safety.
ulated by the Association of Professional Engineers and Geoscientists of Saskatchewan.

have completed a minimum of 8 years of academic study and work experience to earn the Geoscience Licensee.

We see more

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Jones Christoffersen Ltd. • Samszu BH Inc. • Sani Engineering Ltd. • SaskWater • Sintra Engineering • SNC Lavalin Inc. • Standard Machine • TWD Technologies

5 not-so-true ideas about life insurance

(and how to get your facts straight)

1 Employer ben

Employers usually provide life i
salary. Is that enough for your
will you be able to take your c

1–2 times
your annual income is
usually provided by employers

3 It's complicated

How much insurance is right for you? It depends on your situation. Here's a formula you can use to figure it out:[2]

A - (B + C + D + E) = Insurance amount

A = Your family's **assets** and income
B = Your family's monthly **budget** needs
C = **Costs** associated with your death
D = **Debts** to be paid off
E = **Exceptional expenses** (e.g., education costs)

4 They're all th

Not in this case. Only the **Engi**
Insurance Plans are created sp
They are not available to the ge

EXCLUSIVE

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12 engineering regulators.

[1] http://money.cnn.com/retirement/guide/insurance_life.moneymag/index11.htm [2] www.gailvazoxlade.com/articles/just_in_case/how_much_insurance.html

efits are enough

nsurance that's 1–2 times your family? If you change jobs, overage with you?

7–10 times
your annual income is often cited as the rule of thumb for coverage amount[1]

2 Optimists need not worry

Plan like a pessimist — hope for the best but prepare for the worst — especially when going through a life-changing event.

- Marriage
- Mortgage
- Children
- New job

e same

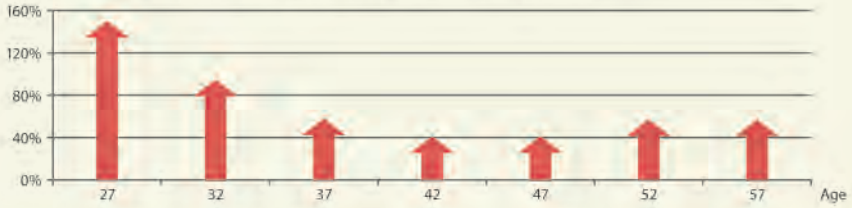
neers Canada-sponsored
pecifically for engineers.
eneral public!

80,000

Over **80,000** of your peers and their families are covered.

5 The lowest price is right

Many advertised rates may seem low at first. But see how the average rate of our 3 lowest-priced competitors **exceeds** our rates over 15 years.[3] For example, a 32-year-old male non-smoker who buys $100,000 coverage from them would end up paying **95% MORE** over 15 years.



[3] LifeGuide® Release 2013.7A

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1-877-598-2273 (Monday–Friday, 8 a.m. to 8 p.m. ET)

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APEGS Association of Professional Engineers & Geoscientists of Saskatchewan

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84th Annual Meeting

Growth & Diversity

May 1-3, 2014 Delta Bessborough, Saskatoon

Thursday May 1

Welcome Event . . . . . 6:00 pm - 10:00 pm

Friday May 2

Buffet Breakfast . . . . . 7:30 am - 9:00 am

Professional Development Streams . 8:30 am - 12:00 pm
. . . . . 3:00 pm - 4:30 pm

Landslides Tour . . . . . 8:30 am - 12:00 pm
Stones of Saskatoon Walking Tour. . . 3:00 pm - 4:30 pm

Professional Development Luncheon. 12:15 pm - 2:15 pm

Committee Fair . . . . . 2:15 pm - 3:00 pm

Past Presidents' / Council Meeting . . . 3:00 pm - 4:00 pm

Networking BBQ and Social. . . . . 5:00 pm - 8:00 pm

Past Presidents' Dinner. . . . . 5:00 pm - 8:00 pm
. . . . . (by invitation)

Presidents' Reception . . . . . 8:00 pm - 11:00 pm

Saturday May 3

Buffet Breakfast . . . . . 7:30 am - 9:00 am

Annual Meeting . . . . . 8:30 am - 9:00 am (Registration)
. . . . . 9:00 am - 12:30 pm (Business Meeting)

Youth Science Day . . . . . 9:00 am - 4:00 pm

Partners' Program . . . . . 9:45 am - 2:30 pm

Recognition Luncheon . . . . . 12:30 pm - 2:30 pm

Committee Meetings. . . . . 2:30 pm - 4:30 pm

Awards Banquet . . . . . 6:00 pm – 10:00 pm

Hospitality Suite to follow.

We see more.

APEGS

KEYNOTE SPEAKER

Andrea Beaty

At the 2014 APEGS Annual Meeting, we will be honoured to welcome as our special guest renowned children's author Andrea Beaty.

Ms. Beaty has written numerous books that help children learn about life and career choices in fun and inspiring ways.

Her latest book, *Rosie Revere, Engineer* touches on many APEGS priorities. Not only does it help young people understand the importance of engineering in our lives but it also inspires young women to consider a future in engineering.

Where some people see rubbish, Rosie Revere sees inspiration. Alone in her room at night, shy Rosie constructs great inventions from odds and ends. Hot dog dispensers, helium pants, python-repelling cheese hats. Rosie's gizmos would astound—if she ever let anyone see them.

Afraid of failure, she hides them away under her bed until a fateful visit from her great-great-aunt Rose, who shows her that a first flop isn't something to fear—it's something to celebrate.

APEGS is pleased to host Ms. Beaty as our keynote speaker at our Professional Development Luncheon. Ms. Beaty will also be staying in Saskatoon for several days as she tours schools in the area.

Andrea Beaty was born in southern Illinois and raised in the village of Ewing, Illinois which was the basis of her novel, *Secrets of the Cicada Summer.* She studied biology and computer science and worked for a software company before she began writing children's books.

She has published 11 books with more on the way. She visits many schools each year to share her love of creativity, books and writing.

The characters in Andrea Beaty's humorous picture books and novels are smart, funny and unapologetic in their passion. They are doers. Curiosity, creativity, innovation and persistence are recurring themes in her work.

Andrea's books have been awarded the Friends of American Writers Award, Parents Choice Silver and Gold Medals, Bank Street College Best Books, National Association of Parenting Publications Gold Medals and the Prairie State Award.

The APEGS K-12 Committee will be doing its part to spread Ms. Beaty's insights by buying a copy of *Rosie Revere, Engineer* for every school library in Saskatchewan.

On-Line Services

APEGS On-Line Services make it easier than ever to conduct your APEGS business:

- ✓ Pay your annual dues
- ✓ Renew your Permission to Consult
- ✓ Report your Continuing Professional Excellence (CPE) credits
- ✓ Update your contact information
- ✓ Select which committees you wish to volunteer for *NEW*
- ✓ Select which constituent societies you wish to release your email address to *NEW*

NEW

Also new to On-line Services.

You can now use the "Fee Payments" section to pay on-line for multiple items owing, including event registration fees, textbook purchases, etc.

How to Access On-Line Services:

From the APEGS home page click on "On-line Services" in Quick Links (blue box). You can also click on "Login" located on the upper right hand corner of the page. Your User ID is your 5-digit registration number (including leading zeros if applicable). If you have never retrieved your password before click on "New Password / Forgot Password". Enter the information requested and an email containing your password will be sent to the email address on record with APEGS. If you do not have a valid email address on record with us, email the APEGS office to have it added to your record at apegs@apegs.ca

On-Line Services can be used at any time of the year to manage your information with APEGS.

Announcing the winner of the iPad draw

APEGS held a draw for an iPad to encourage our members to use On-Line Services during the 2014 renewal season. At least one of the items listed above had to be completed in On-Line Services by January 31, 2014, and membership had to be renewed for 2014. 6,683 of the 9,756 members who renewed for 2014 were eligible for the draw.

The winner is ... Shyam Swarnakar, P.Eng.

Congratulations Shyam and thank you to all our members who used On-Line Services for the 2014 renewal season.

Letter to the Editor

In the Nov/Dec 2013 issue of *The Professional Edge,* APEGS President Gelowitz submitted the President's Report, in which he provided a disturbingly harsh and negative viewpoint regarding the recent signing of an Incidental Practice Agreement for Geoscientists between the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) and the Association of Professional Geoscientists of Ontario (APGO). He also indicated that APEGS Council passed a motion which does not support the concept of Incidental Practice.

I would like to, once again, provide an alternative viewpoint. I have previously voiced my objection to APEGS' oddly negative perspective on Incidental Practice years ago (*The Professional Edge*, Winter 2005 issue) and had wrongly assumed that APEGS had become more receptive to this concept due to the requirements of the Agreement on Internal Trade. However, the recent President's Report indicates otherwise. I won't repeat my prior comments (which I believe are still relevant) but would refer the reader to the original letter.

In my many discussions on Incidental Practice with geoscientists across the province since that time, I have noted general support for this idea. Because of this observation, I am deeply concerned that the actions of APEGS are not the consequence of effective consultation with professional geoscientists in this province. Many geoscientists I know view the incidental practice agreement between BC and Ontario as a progressive step forward, one that is more in keeping with their needs as professionals as well as abiding by new agreements on worker mobility across the country. To many of my colleagues, myself included, it appears that the only real obstacle in the way of incidental practice is the insistence by APEGS that there must be payment of full fees in every jurisdiction.

Finally, given the comments in the President's Report, I have several questions for President Gelowitz and APEGS Council:

I would ask for an explanation as to how lawyers have been able to have a form of Incidental Practice without apparently compromising public safety and despite also being provincially regulated.

Why would APEGS publicaly state their opposition to the BC and Ontario Incidental Practice agreement **before** these professional and fraternal organizations have had a fair chance to "test drive" and discuss the results of this agreement?

Why has APEGS never organized "town-hall" discussions (for example… with CIM Saskatoon Section and the Saskatchewan Geological Society in Regina) to talk with our membership about Incidental Practice and why has there never been a poll of members as to their opinions on this issue?

I am sure that APEGS geoscientists would be very interested in the response to these questions.

Regards
Dan Jiricka, P.Geo., P.Eng.

APEGS RESPONSE

The Professional Geoscience Mobility Agreement entered into between APGO and APEGBC allows geoscience professionals registered in one of the signatory provinces to perform short-term work – no more than 45 days per year - in the other, without the need to hold a licence in that province.

There is nothing "incidental" about this type of practice. *The Engineering and Geoscience Professions Act* of Saskatchewan states that: "No person who is not a licensed professional geoscientist shall engage in the practice of professional geoscience." In this case, being licensed means being licensed in the province of Saskatchewan. Council does not endorse practising without holding a licence and anyone who does can be subject to prosecution under the *Act*.

Dwayne Gelowitz, P.Eng., FEC
President

Award Winners & Banquet

Saturday, May 3, 2014

Delta Bessborough, Saskatoon

Reception 6:00 pm / Banquet 7:00 pm

Outstanding Achievement Award

Richard T. Burton, 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.

Promising Member Award

Brent R. Wolfater, 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.

McCannel Award

Douglas J. Kozusko, P.Eng.

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.

Brian Eckel Distinguished Service Award

Don C.K. Poon, P.Eng.

This award was established in 1978 to recognize outstanding contributions in service to the community, the Association, technical and learned organizations, and 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.

Friend of the Professions Award

Leslie Bell

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

Exceptional Engineering / Geoscience Project

Genivar: Campbell Collegiate Underpinning Project

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

Environmental Excellence Award

Northgate Commodity Logistics Centre Project

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.

Tickets: $50 per person. **Contact:** APEGS, Suite 104 - 2255 13th Avenue, Regina Saskatchewan S4P 0V6
Tel: (306) 525.9547 - Toll Free: 1 (800) 500.9547 - Email apegs@apegs.ca - Register online: **www.apegs.ca**

APEGS View

Council Notes

February 6 and 7, 2014
Delta Bessborough, Saskatoon, SK

18 of 19 Councillors present

- The Regina Engineering Society reported that the annual Horizons Dinner is scheduled for March 4, 2014, coinciding with Engineering and Geoscience Week in Saskatchewan.
- The Saskatoon Engineering Society will again be holding its Industry Celebrating Excellence event at the Saskatoon Club on March 5, 2014, coinciding with Engineering and Geoscience Week in Saskatchewan.
- Council approved the recommended changes to the Academic Review Committee's terms of reference.
- Kristin Darr, P. Geo. has been appointed to the Licensee Admissions Committee for a three-year term.
- Council approved 64 new life members.
- Council was advised that the Image and Identity Board approved sponsorship of $1.000 for Canstruction Regina.
- Karen Cossitt, P.Eng. has been appointed to the Communications and Public Relations Committee for a three-year term.
- Council approved the recommendations of the Awards Committee and the 2014 APEGS award recipients will be recognized at the 2014 Awards Banquet.
- Council was advised that Bob Hawboldt, P.Eng. will lead the development of the terms of reference for the gifts with the libraries. The target is September for final signed terms and gift payment, complete with a press/awareness campaign.
- The Professional Development Committee is developing a plan to deliver professional development events quarterly for the membership. They are also planning to include preparation for eventual mandatory Continuing Professional Excellence reporting.
- The Student Development Committee has developed a new funding assessment matrix which speeds up the process for student groups and committee members. The new system provides a much clearer definition of the types of events that will be sponsored.
- The University of Regina Senate reported 13,586 students, 1,765 are international, 11 per cent self-declared Aboriginal and 1,069 are engineering students, representing an increase of 21 per cent over 2013. Dr. Dena McMartin, P.Eng. has replaced Dr. Luigi Benedicenti, P.Eng. as the new AVP Academic and Research.
- Council appointed Peter Jackson, P.Eng., FEC, FGC (Hon.) as Vice-Chair of the Investigation Committee for a two-year term.
- The next Council meeting is scheduled for April 10 and 11, 2014 in Regina.

engineerscanada

2014 FEC Awards

Zahra Darzi, P.Eng.
Ashley I. Forbes, P.Eng.
John A. Styles, P.Eng.
Terry M. Werbovetski, P.Eng.
Darren L. Wingerak, P.Eng.
Luigi Benedicenti, P.Eng.

RCE SASKATCHEWAN
REGIONAL CENTRE OF EXPERTISE ON EDUCATION FOR SUSTAINABLE DEVELOPMENT

APEGS is proud to be a sponsor of the RCE Saskatchewan Recognition Program which provides recognition to innovative research, projects and activities promoting education for sustainable development in Saskatchewan.

Projects will be recognized at a special celebratory luncheon on Thursday, May 7 at Government House in Regina.

For more information, visit:
www.saskrce.ca/2014_recognition_event

Awards Nominations

Do you know a professional engineer or geoscientist who should be considered for an award?

Do you know about an engineering or geoscience project that deserves recognition?

The Awards Committee is seeking nominations for the annual APEGS awards as well as for a range of other provincial and national awards.

For more information on awards or the nomination process, please contact the APEGS office at 1-800-500-9547, fax (306) 525-0851 or email apegs@apegs.sk.ca.

Regina Hosts **CCWESTT Conference**

The Canadian Coalition of Women in Engineering, Sciences, Trades and Technologies (CCWESTT) is holding its 15th biannual conference in Regina, May 22-24, 2014. CCWESTT's mandate is the promotion of women in science, engineering, trades and technology, and celebrating their contributions to these fields.

The theme this year is
"Open Opportunities: Mentoring the Future".

The conference is intended to attract young women to careers in science, engineering, trades and technology (SETT) fields and to provide support and mentorship to women starting out in SETT careers.

This is the first year that the conference will include sponsored attendance for high school math/science teachers. Ten Saskatchewan teachers will be taking part in the conference. There will also be a youth program targeted at both girls and boys, grades 9-11.

Some noteworthy keynote speakers include: Dr. Lynda Haverstock, Alvin Law, Stephen Lewis and Hayley Wickenheiser. The breakout sessions will focus on recruitment and retention, mentoring, diversity, and balanced lifestyles.

For more information on the conference:
www.ccwestt2014.ca
Facebook: "Ccwestt-2014-Conference-Regina"
Twitter: @CCWESTT

CCWESTT 2014
Open Opportunities: Mentoring the Future
Regina, SK

Hire a STUDENT!

Enrolment is way up in the Co-op and Internship programs at the University of Regina and that means great news for employers!

Post a job with us and we can get you a great selection of resumés within a few days.

Co-op students are available to start in late April-early May and can work for either four or eight months, while Engineering Internship students are available to start in late April-early May for 12 or 16 month terms.

In addition, we have a number of students in the Aboriginal Full Circle Summer Internship program that are also seeking summer placements. Aboriginal interns are from a variety of disciplines and seek work placements between May and September.

Please contact us if we can help you with any and all student hiring. We are your one-stop shop for hiring students!

Career Services
Co-operative Education
University of Regina
Phone: 306-585-4600
Email: coop.office@uregina.ca

New Website!

Check us out at
www.apegs.ca

News Beyond Our Borders

www.independent.co.uk

Oldest piece of Earth's crust found

A sheep ranch in the remote Jack Hills region of western Australia has yielded a huge discovery – tiny zircon crystals that scientists have now confirmed are the oldest known materials formed on Earth. According to their findings, published in the journal *Nature Geoscience*, the crystals are fragments of the Earth's crust and date back some 4.4 billion years, just 100 million years after the formation of the planet itself.

Measuring only 200 by 400 microns– about twice the diameter of a human hair–the crystals might not look like much to the naked eye, but their advanced age strongly suggests that Earth may have formed a continental crust – and, potentially, may have sustained life - much earlier than scientists previously believed.

Source: History.com

Canadian oil beats US on costs, bank study says

Western Canadian oil plays, including the oil sands, can compete on costs with the best light tight shale oil plays in the United States, a new study says.

An examination of 50 plays in Canada and the US shows that, on average, Canadian oil plays can generate decent returns at a cheaper benchmark West Texas Intermediate oil price than those in the US, according to the latest Scotiabank commodity report.

Canadian producers pay less in government royalties but advances in technology have also helped with competitiveness, especially in the oil sands.

The Scotiabank report shows that an average steam-assisted, gravity drainage oil sands production in Alberta breaks even at about $63.50 US per barrel. The thermal technology accounts for 1.08 million barrels per day or 46 per cent of Alberta's oils ands output and is likely to represent three-quarters of the 1.2 million barrels per day growth projected through 2020.

The report adds that oil sands projects are long life and low decline, in contrast with short life and rapid decline rates of shale projects now being developed, thanks to implementation of horizontal drilling and hydraulic fracturing technology.

Source: Calgary Herald

Engineering a greener world

Canada's largest engineering school is preparing to launch a new graduate diploma looking to reshape the green energy landscape.

The University of Waterloo's Faculty of Engineering will offer the new diploma program beginning this fall. It is the first of its kind in Canada.

The program includes a unique combination of in-class sessions and real-time online courses where students can see and interact with their instructor and other classmates through an interactive instruction facility called Live-Link.

The diploma course is designed to enhance technical knowledge and training in green energy systems ranging from bioenergy, fuel cells and greenhouse gas management to solar and wind energy and building energy performance. It will be offered in collaboration with the Waterloo Institute for Sustainable Energy.

The topics of discussion will go beyond the mere nuts and bolts of green energy engineering to include a more nuanced examination of green energy in the modern context, including some of the controversy surrounding it such as the ongoing concerns from residents living near wind turbines.

Source: Waterloo Chronicle

Glue may help to heal

It's not superglue, but hot bone glue being developed in Halifax could make cranial and facial surgery simpler, quicker and more effective.

Mehdi Kazemzadeh-Narbat, an Iranian native who holds a doctorate in biomedical engineering from the University of British Columbia, is doing preclinical testing at Dalhousie University, where he is a post-doctoral fellow, on a bone glue developed by Dartmouth Medical Research Ltd. of Halifax.

The glue, which is applied hot and cures within seven minutes, saves time and expense by avoiding the need for drilling and implanting screws and plates, which takes about 30 minutes after surgery and usually requires further medical procedures to remove them.

Kazemzadeh-Narbat said the glue, which could be useful in repairing complex, fragmented fractures, is similar to polymers approved for medical use by the U.S. Food and Drug Administration.

Source: Halifax Chronicle Herald

University of Victoria launches world's most powerful microscope

The University of Victoria's one-of-a-kind microscope is winning global interest from academics and businesses keen to find out what secrets the high-resolution device can reveal.

Workshops to train scientists studying everything from medicine to engineering on how to use the ultra-sensitive microscope are expected to start this fall.

UVic scientists are learning how to use the new Scanning Transmission Electron Holography Microscope, or STEHM.

The seven-tonne, 4.5-metre-tall microscope, with a footprint of six square metres, exposes subatomic objects at a magnification of up to 20 million times larger than what a human eye can see.

It uses an electron beam and holography techniques to study surfaces and the insides of materials. Gold atoms have already been viewed at a resolution of 35 picometres – a pictometre is one trillionth of a metre – and the microscope is expected to be able to reach higher resolutions.

Academics will be the main users, she said. Departments that will be interested include chemistry, electrical and mechanical engineering, bio-chemistry, biology and physics.

Rodney Herring, a professor of mechanical engineering and director of UVic's Advanced Microscopy Facility, spearheaded the move to acquire the microscope, starting his efforts in 2002.

"The STEHM will be used by local, regional, national and international scientists and engineers for a plethora of research projects relevant to the advancement of mankind," said Herring, who has been testing the microscope.

Source: Victoria Times Colonist

www.arch2o.com

Museum in the Clouds

The sixth Messner Mountain Museum being built in Italy's Dolomite Mountains will take a unique approach to educating visitors about rocks – it will be located inside a mountain peak.

The 1,000-metre structure will also offer an adjoining panoramic viewing platform. It is being built atop a 2,300-metre-high mountain. The museum is named for mountain climber Reinhold Messner.

IPM of Bruneck, Italy is in charge of structural engineering and says that one of its biggest challenges is the inclined geometry. Walls slant up to 15 degrees form vertical. Three-dimensional modelling was used to tackle the difficult task of making accurate calculations.

Source: Civil Engineering Magazine

New biofuel plant "wastes" no time

Edmonton's new biofuel plant began testing in December as it plans to start operations in early 2014. The former landfill site is a partnership between Enerkem, the City of Edmonton and Alberta Innovates. The plant will transform 100,000 dry metric tons of municipal solid waste per year into 38 million litres of ethanol. This will help the city achieve its goal of diverting 90 per cent of residential waste from the landfill. According to Enerkem, the project is the world's first major collaboration between a metropolitan centre and a waste-to-biofuels producer.

Source: The PEG, magazine of the Association of Professional Engineers and Geoscientists of Alberta

News From The Field

googlemaps.com

Sask. government approves metal processing facility

Global News – The Saskatchewan government has given the green light to the construction and operation of a metal processing plant in Langham.

Government officials said the proposal from Fortune Minerals was found to be both environmentally and technically sound under *The Environmental Assessment Act* after the initial proposal was sent back to the company to do some additional work on their application. Environmentalists and locals have concerns about the proposed plant.

Fortune can now move forward to obtain the necessary approvals, permits and licences to build and run the Saskatchewan Metals Processing Plant on a plot of land 2.5 kilometres from the town located northwest of Saskatoon.

A government-wide technical review of the project included a full assessment of groundwater availability, the potential for groundwater contamination and whether the activity is well within Saskatchewan's stringent environmental standards. The Water Security Agency confirmed that the proposed use of groundwater is sustainable.

Fortune plans to process around 65,000 tonnes of ore each year into gold, bimuth, cobalt and copper products. The ore will be transported by rail from the company's mine in the Northwest Territories.

It is expected the $200 million project will create 200 jobs over the construction period and create approximately 100 permanent positions for the region.

Lystek opening in Saskatchewan

Bayshore Broadcasting – International waste processors Lystek announced plans for a new waste-to-fertilizer plant in North Battleford.

The process will enable the city to divert biosolids from landfill and convert them into a nutrient-rich fertilizer for use by area farmers.

North Battleford director of public works and engineering Stewart Schafer, P.Eng. said, his city is excited to be the first community in Western Canada to add Lystek technology to their waste water facilities.

Schafer calls it a smart economic and environmental decision that will pay many dividends and support their community plan of building a strong and sustainable community.

The approximately $3 million installation at the waste water treatment plant will be similar to other, on-site Lystek installations.

MINING

Patience, luck are key to diamond mining in Saskatchewan

CBC News - Twenty-five years after deposits of diamonds were identified in Saskatchewan's north, people in the mining business say it will take patience, and some luck, to create a viable diamond industry in the province.

One of the companies that is looking for diamonds is North Arrows Minerals.

"There is a real process involved and it requires patience and persistence," company president Ken Armstrong told CBC News, noting the normal progression, if all goes well, to a functioning mine is 15 years.

Another company, Shore Gold, has been working on its Fort-a-la-Corne site, east of Prince Albert, since 1995.

"The kimberlites are very big, and it takes a long time to evaluate them," Shore Gold Vice-President George Read explained. "The fact that they are covered by 100 metres of (rock) meant that a lot of work had to be done."

Shore Gold has prepared studies which it believes show that a diamond mine is economically viable. It is currently working on

various permits and financing to get a mine in operation. The company hopes to do this in about five years.

BHP Billiton aims to build stronger ties with Aboriginal community

CJME - An Australian mining company is focusing on creating stronger business ties with the Aboriginal community in Saskatchewan.

The company is building the Jansen potash mine about 140 kilometres east of Saskatoon.

The corporation recently signed an opportunities agreement for First Nation participation in the Jansen potash project. That agreement encompasses several things including education, coaching and working with suppliers and contractors.

BHP Billiton is still in the early stage of the Jansen project, with 150 Aboriginal employees out of 500 workers right now. Archila expects that to grow to as many as 2,500 employees but wouldn't speculate on how many of those would be Aboriginal.

www.k-pluss.com

Legacy potash test cavern completed

Saskatoon StarPhoenix - The first cavern for extraction of potash brine solution was connected at the Legacy site of K+S Potash Canada's mine.

"This is a very significant milestone for our Legacy Project," said Dr. Ulrich Lamp, president and CEO of K+S Potash Canada, in a news release. "We are on schedule and on budget for the construction of our new potash mine."

Legacy, located near Bethune, is Saskatchewan's first greenfield potash project in more than 40 years and will use a solution mining technique.

The mine is scheduled to open in the summer of 2016.

Winter woes drive up costs at Agrium potash mine

Canadian Press - Nasty weather is driving up costs at Agrium's potash mine expansion in Saskatchewan, making it more difficult for the fertilizer company to get its products to market.

Company executives said the cost of the Vanscoy project, southwest of Saskatoon, has risen by 25 per cent over the original estimate of $1.5 billion. That brings its price tag close to $1.9 billion.

A company spokesman said Saskatoon suffered through temperatures colder than minus 30 degrees Celsius for much of December, while high winds made work even more difficult.

Construction is about 65 per cent complete on a project that is expected to boost production capacity at the mine by 40 per cent by 2015.

Calgary-based Agrium said it's keeping its eye on another weather-related challenge: getting its crop nutrients to customers by rail.

Snow and cold have slowed rail shipments. That, combined with last year's bumper crop of grain in Western Canada and several other factors, has led to a traffic jam on the tracks. Agrium relies on rail to export its product to the US and overseas, via export points like the Port of Vancouver.

K+S Potash and AMEC sign long-term contract

YourMiningNews.com - K+S Potash Canada has signed a long-term design and project management contract with AMEC for the Legacy Project, a solution potash mine located about 50 km north of Moose Jaw.

AMEC has provided continuous service to the Legacy Project since the end of 2011. Under the initial contract, AMEC completed basic engineering and provided project management, detailed engineering and construction management services for the production facility, including earthworks, first piling activities, production cavern facilities and plant utility works.

Under the new contract, AMEC will continue to manage all detailed design and implementation activities through to plant start-up, including: detailed engineering; supply chain; health, safety, security and environment (HSSE); construction management; and commissioning and project management services for the mining, processing and site infrastructure facilities. Work on the project is under way and commissioning is forecasted for 2016.

www.nationalpost.com

Mining firms watch Hells Angels case

CBC News - Until last year, Hells Angels from the Saskatoon chapter worked at the Agrium potash mine near Vanscoy and at the Potash Corp. mine at Cory. They lost those high-paying jobs when Leonard Banga at Xtreme Mining and Demolition decided he didn't want Hells Angels in his company. This decision has triggered alleged death threats and a potential lawsuit.

Mining companies across the province are closely watching the story unfold.

"I think it did make people reflect on their hiring policies and their harassment policies in the workforce, and making sure that contractors were accountable for the actions of their employees," said Pamela Schwann, P.Geo., executive director of the Saskatchewan Mining Association.

Three Hells Angels from the motorcycle club's Saskatoon chapter are threatening to sue Banga for defamation and wrongful dismissal. They lost their jobs at the company when they revealed on a company questionnaire that they are members of what Banga calls a criminal organization.

Banga said he introduced the questionnaire because of complaints from other workers of threats and intimidation from the Hells Angels.

Saskatchewan ranks 12 in mining attractiveness

Saskatoon Homepage - Saskatchewan finished just out of the top 10 in this year's assessment of worldwide mining investment attitudes. Alberta remains the most attractive jurisdiction in Canada for mining investment, according to the annual global survey of mining executives by the Fraser Institute. For the second consecutive year, Alberta ranks first in Canada and third worldwide. The survey is based on responses from 690 mineral exploration and development executives. Alberta, New Brunswick and Newfoundland and Labrador crack the top 10 worldwide. Saskatchewan comes in 12th place worldwide.

CONSTRUCTION & INFRASTRUCTURE

SK utilities unite to reduce underground damage

OH&S News - SaskEnergy, SaskPower, and SaskTel announced a joint plan to reduce the number of incidents where their buried power, natural gas and telecommunications lines are damaged. It's a significant and growing problem: SaskEnergy had 255 incidents in 2013 while SaskPower had 197 incidents and SaskTel had 585 incidents.

In addition to damage prevention programs already in place, the Crown corporations will:

- offer an enhanced Sask 1st Call public awareness campaign and a Sask 1st Call Mobile App.
- introduce a pilot project involving safety patrols to monitor construction activities in new subdivisions in Regina and Saskatoon where more damage is occurring to buried lines.
- renew the contract for Magna Electric Corporation to perform joint line locating for all three utilities; their news release stated it is a North American industry leading safety practice to have one qualified technician locate multiple buried lines rather than several companies performing this service separately.

SaskEnergy said its incident reports show pipelines are increasingly being punctured in new urban neighbourhoods during landscaping, deck and fence installations, and driveway installations.

"Aside from service disruptions and the financial consequences of hitting an underground line, safety is a huge concern," agreed Robert Watson, president and CEO at SaskPower, an electric utility. "Each time someone hits a power line, it has the potential to result in serious injury or loss of life. Ideally, we want to see zero incidents. The more we can do to prevent any incidents when it comes to working near underground lines, the better."

Saskatchewan's construction industry prepares for shift in workforce

BuildForce Canada - Skilled labour requirements over the coming decade are changing, requiring many of the workers recruited over the last several years to stay on for major new projects, according to BuildForce Canada.

The 2014-2023 Construction and Maintenance Looking Forward forecast released by BuildForce Canada shows construction activity and employment growth slows, but stays well above historical levels. Major resource projects that drove construction employment to a record high in 2013 come to completion, signalling some shift in the labour force away from big projects and housing. A large segment of the workforce will be employed in commercial and institutional building, where there is steady growth.

BuildForce Canada's forecast also shows:

Residential has been one of the fastest growing markets in Canada over the last few years, with a peak in residential construction in 2013. The housing labour force will shift to renovation work, partially offsetting slower new housing activity. The workforce remains well above historical levels at the end of the scenario period.

Non-residential construction employment has increased by 50 per cent since 2007. While major activity is expected to slow, with fewer opportunities in engineering construction, this is partially offset by steady but moderate growth in industrial, commercial and institutional construction. This keeps employment well above historical levels.

Just under 7,000 workers are expected to retire over the next decade, with retirements spread across all construction trades and occupations.

BuildForce Canada is a national industry-led organization committed to providing accurate and timely labour market data and analysis to assist in meeting workforce requirements and advancing the needs of Canada's construction industry.

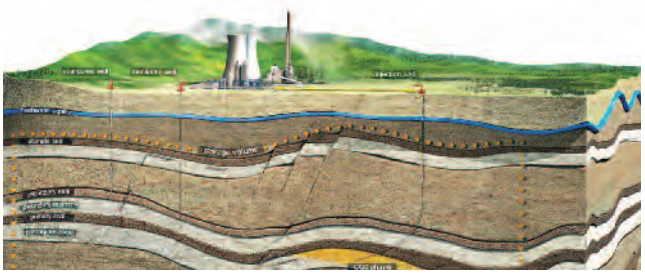
ENERGY

Wall promoting carbon capture technology

Estevan Lifestyles - Premier Brad Wall travelled to Washington, D.C., to promote Saskatchewan's leading-edge work to reduce greenhouse gas emissions through carbon capture and storage (CCS) technology. On March 5, he was a featured panellist at a coal technology symposium for US legislators and energy experts.

Wall outlined the CCS research that has taken place in Saskatchewan over the past 30 years, and showcased SaskPower's Boundary Dam integrated CCS project, which is the world's first commercially viable project to capture carbon dioxide from a coal-combustion power plant.

"Coal is not going away as a major energy source, either



www.dnv.no

here in Saskatchewan or in the United States," Wall said. "Boundary Dam (Unit) 3 is opening in mid-2014. It will be a game changer, showing the world how we can all continue to use our coal resources while addressing the challenges of greenhouse gas emissions and helping industry leave a greener and smaller environmental impact."

OIL & GAS

SK thermal heavy oil project moving forward

Journal of Commerce - BlackPearl Resources Inc. is moving forward with the construction of the Onion Lake thermal heavy oil project in Saskatchewan, after signing a deal with underwriters to raise funds.

Onion Lake is a conventional heavy oil property that also has the potential for thermal development on a portion of the land, which is located on the Onion Lake First Nation reserve, along the border between Saskatchewan and Alberta, near Lloydminster.

Thermal projects use steam or other heat sources to help heavy oil flow more easily and quickly.

Final regulatory approval for the construction of a 12,000 barrel per day thermal enhanced oil recovery project at Onion Lake was received by BlackPearl Resources in the third quarter of 2013.

The company has decided to develop the project in phases, with the first phase designed for 6,000 barrels of oil per day, instead of proceeding directly with a 12,000 barrel per day project.

This approach allows the company to reduce the size of the initial phase of the project while lowering capital requirements and technical risks.

Husky Energy plan to build two new SK facilities

Journal of Commerce - Husky Energy is moving forward with the construction of two new heavy oil thermal projects near Lloydminster, Saskatchewan.The projects are part of a strategic plan to increase production and transform the business.

Engineering work is already under way on both projects, which will each produce 10,000 barrels per day and are located in the Rural Municipality of Turtle River.

The Minister of the Environment determined late last year that neither project required an environmental assessment, but both must follow specific terms and conditions.

The project location was selected to reduce or avoid construction on native vegetation and other sensitive areas.

Most of the facilities will be on previously disturbed land.

In addition, Husky has committed to using low-impact construction techniques such as directional drilling, wherever possible to prevent impacts to wetlands and watercourses which cannot be avoided.

URANIUM & NUCLEAR

Canada not easing uranium investment rules

Reuters - Canada has no plans to further ease rules for foreign investment in uranium mines after Ottawa moved to give European Union firms more leeway, a senior official said.

As part of a Canada-European Union free trade deal that was announced in principle last year, Ottawa waived a long-standing requirement that EU buyers take on a Canadian partner in uranium mines.

Canadian officials said that they did not intend to make the same offer to non-European companies such as Australia's Rio Tinto Ltd., which has uranium deposits in northern Saskatchewan.

Canada, the world's second biggest producer of uranium after Kazakhstan, bans foreign companies from owning more than 49 per cent of any uranium mine.

Rio Tinto is pressing Canada to change the policy, which dates back to the Cold War.

Cameco welcomes Japan's atomic commitment

Business Week - Cameco Corp. welcomed a commitment by Japan to continue nuclear power almost three years after the meltdown of three reactors at the Fukushima Dai-Ichi nuclear power plant.

As Prime Minister Shinzo Abe seeks the restart of the nation's 48 reactors, all of which are idled for safety checks, the government yesterday presented its draft energy policy showing nuclear as an important component in the nation's future energy mix.

"To put it out now in black and white is very encouraging," Cameco Chief Executive Officer Tim Gitzel said yesterday in an interview. "The process is unfolding as we thought it would, it's just taking longer" than expected.

Cameco recently agreed to sell a stake in a power plant for $450 million as it focuses on uranium mining. Gitzel said the company is excited about the long-term prospects for the market, with demand projected to outstrip supply.

Innovation Saskatchewan looks to get province back on top of nuclear research

Metro Saskatoon - A partnership between Innovation Saskatchewan and the Japanese engineering corporation, Hitachi, could play a part in restoring power to the province's reputation as a leader in nuclear technologies.

Scientists at the universities in Saskatoon and Regina will be looking into the following areas: small reactor technologies, safety and the environment, medical research and nuclear materials.

Innovation Saskatchewan has committed a total of $5 million to the Hitachi partnership and has already funded $1.2 million.

ENVIRONMENT

Concern about oil sands effects on Sask. lakes

Regina Leader-Post - Researchers at the University of Regina are keeping a close eye on 244 lakes in northwest Saskatchewan to see what impact, if any, gas emissions from the Athabasca oilsand region could be having.

Bjoern Wissel, associate director at the Institute for Environmental Change and Society, is one of four researchers along with the provincial ministry of environment that surveyed 244 lakes in northwest Saskatchewan from 2007 to 2009 looking for proof of a relationship between chemical changes to zooplankton in the lakes and emissions from the oilsands.

Although sulphur dioxide and nitrous oxide emissions, mostly from vehicles and heavy machinery working at the oilsands, are believed to be making their way downwind to the lakes, Wissel admits there is no direct correlation between changes to zooplankton and emissions.

However, he did say that the changes are a warning sign and that more research needs to be done given that what researchers found is similar to changes that took place in Ontario in the 1980s when acidity levels rendered several lakes uninhabitable for fish.

The Saskatchewan Science Centre is looking for YOU!

We inspire children every day. Now it's your turn.

Our mission is to ***ignite scientific curiosity and innovation in Saskatchewan communities***. We provide interactive exhibits and a place for children and adults to explore, play, and learn.

As part of our ***Innovators in the Schools*** series, we bring motivated and engaging people involved in science, innovation, and technology together with groups of school children. These speakers will entertain and educate the students about the amazing work that they do and what it's REALLY like to work in science related fields. The children will ask questions like "Why did you become an engineer?" and "What exactly do you do every day?" We need professionals to talk to these children and share their experiences.

Don't be shy. Future generations of Professional Engineers and Geoscientists are in schools right now, and they want to know more about the interesting careers that are available to them when they grow up.

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For more information, please contact **Kim Mack** at **306-791-7920** or email **kmack@sasksciencecentre.com**.

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Calendar of Events

www.lakediefenbakertourism.com

Law and Ethics Seminar
April 25-26, 2014, Saskatoon, SK
www.apegs.sk.ca

APEGS Annual Meeting
May 2-3, 2014, Saskatoon, SK
www.apegs.sk.ca

2014 27th Canadian Conference on Electrical and Computer Engineering
May 5-8, 2014, Toronto, ON
ccece2014.org/index.html

The Canadian Institute of Mining (CIM) Convention & Expo!
May 11-14 , 2014, Vancouver, BC
vancouver2014.cim.org

The Canadian Coalition for Women in Engineering, Science, Trades and Technology (CCWESTT) Conference 2014 Open Opportunities: Mentoring the Future
May 22-24, 2014, Regina, SK
www.ccwestt2014.ca

Sustainable Municipalities Conference
May 28-31, 2014, Halifax, NS
www.csce2014.ca

ACEC-SK Annual General Meeting & Golf Tournament
May 30, 2014, Elbow, SK
www.acec-sk.ca/files/2014 AGM Golf Tournament Poster.pdf

Water: What is the Future We Want?
June 2-4, 2014, Hamilton, ON
www.cwra.org/en/

The Value of Green: Building Lasting Change
June 2-4, 2014, Toronto, ON
www.cagbc.org

CSCE Short and Medium Span Bridge Conference
July 15-18, 2014, Calgary, AB
www.smsb2014.ca

OCEANS 2014 - Oceanic Engineering Society conference
September 14-19, 2014, St. John's, NL
www.ieee.org/conferences_events/conferences

Western Canada Water 2014 Annual Conference and Exhibition
September 22-26, 2014, Regina, SK
www.http://wcwwa.ca/events/

Warming of the North 2014 Conference
September 28-30, 2014, Ottawa, ON
www.umanitoba.ca/faculties/management/ti/2772.html

2014 IEEE Electrical Power and Energy Conference
November 12-14, 2014, Calgary, AB
www.ieee.org/conferences_events/conferences

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