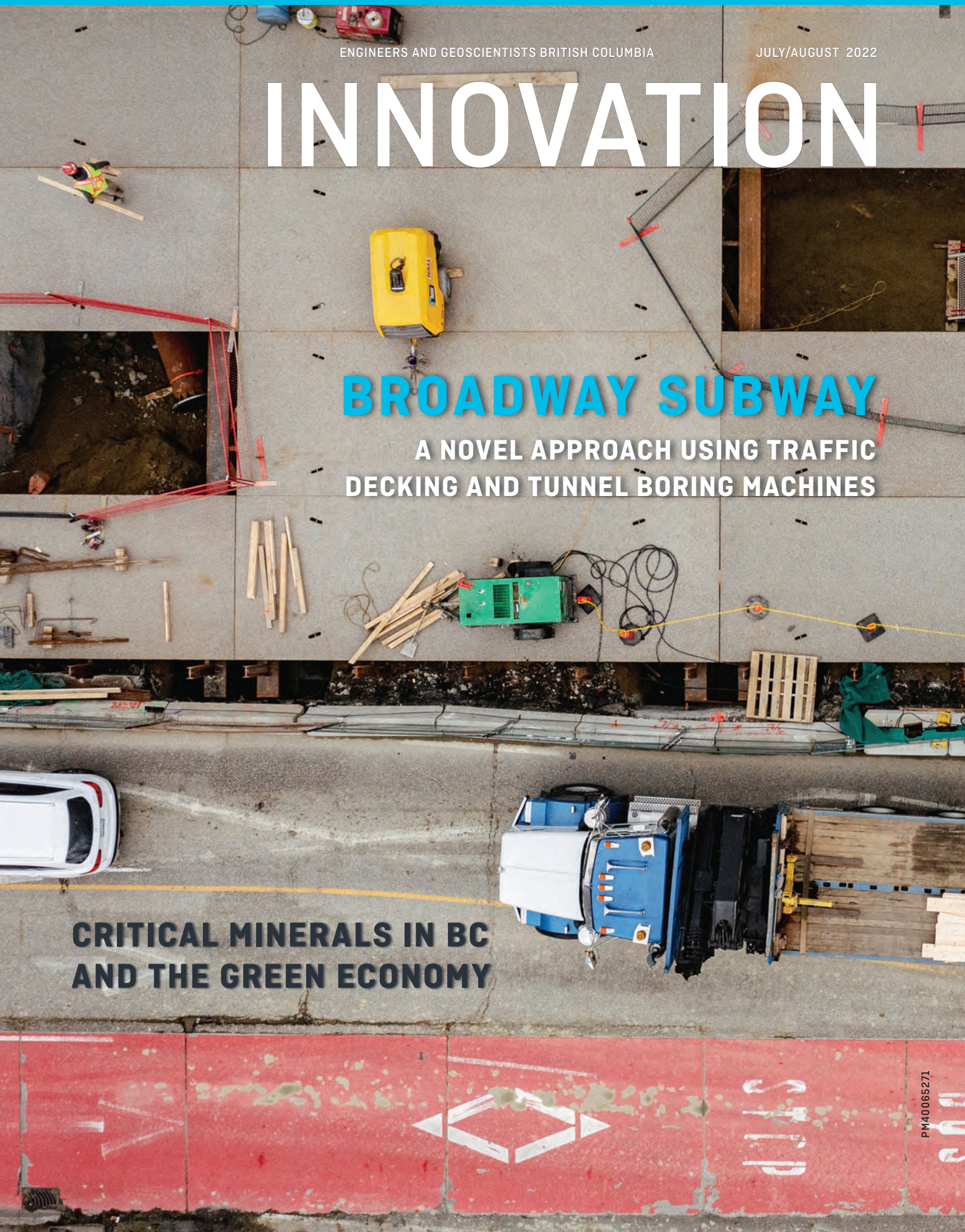
Council Election Nominees | Legislation Amendments | Annual Conference Keynotes

ENGINEERS AND GEOSCIENTISTS BRITISH COLUMBIA JULY/AUGUST 2022

INNOVATION



BROADWAY SUBWAY

A NOVEL APPROACH USING TRAFFIC DECKING AND TUNNEL BORING MACHINES

CRITICAL MINERALS IN BC AND THE GREEN ECONOMY

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ENGINEERS &
GEOSCIENTISTS
BRITISH COLUMBIA

ANNUAL GENERAL MEETING

SATURDAY, OCTOBER 15, 2022
8:30 AM–12:00 PM

The 2022 Annual General Meeting (AGM) will be held virtually. The AGM is an opportunity for registrants to hear from Council and senior staff on the organization's strategic process, key initiatives, and financial standing. It also provides an opportunity for registrants to participate in self-regulation by bringing forward motions for the consideration of Council.

The AGM is free to attend, but registration is mandatory by Monday, October 10, 2022 at 5:00 PM, Pacific Time.

egbc.ca/agm

INNOVATION

JULY/AUGUST 2022 | VOLUME 26 NUMBER 4

COVER STORY

FUTURE-PROOFING VANCOUVER TRANSIT

The disruption and inconvenience is difficult to ignore, but the province and a host of other government agencies believe it's all for a good cause: building an underground transit system that will address critical transportation needs in an area that supports more than 125,000 residents that rely on transit to get to their workplaces and homes.

CRITICAL ELEMENTS IN BC

The push towards critical minerals as a means to provide a helping hand to address climate change concerns, and bolster the transition towards a green economy, is changing the shape of resource extraction across Canada—and in BC.

NEWS / DEPARTMENTS

COMMENT

OTHER

ON THE COVER

The Broadway Subway Project involves traffic decking, where decks are installed on surface while excavation and construction continue below. PHOTO: BC MINISTRY OF TRANSPORTATION

THIS DIGITAL EDITION OF *INNOVATION* INCLUDES VIDEO EXTRAS. LOOK FOR THIS PLAY ICON, AND CLICK ON IT TO VIEW VIDEO AND OTHER MULTIMEDIA CONTENT. AN INTERNET CONNECTION IS REQUIRED.

ENGINEERS & GEOSCIENTISTS BRITISH COLUMBIA

LIFELONG LEARNING, FOR YOU AND FOR US

President Carol Park and I agree that this ViewPoint column should be a collaborative space where Engineers and Geoscientists BC leaders can share their views with registrants. So I thank her for giving me this chance to share something that I think is important with you.

Continuing education might be commonplace for professionals across other industries and provinces in Canada, but it's new to many registrants in BC. Last month, we passed our first reporting deadline for mandatory Continuing Education (CE) under the *Professional Governance Act*. That makes this a good time to reflect on why CE is so important—and how we, as an organization, can improve our own reporting processes.

The intent behind CE is a philosophy of lifelong learning in our work and our projects; it's about getting a little better, continuously. It's the idea that new methods, techniques, technologies, and ways of thinking emerge over time, and we can benefit from adopting fresh ways to approach our work.

Many of you know that I am also a registrant, so I was required to complete CE requirements along with everyone else. I found the experience fairly straightfoward, although some aspects of reporting CE looked a little daunting at first. In particular, completing a CE Plan led me to focus on what aspects of my professional education that might need attention to make me a better professional. That's what makes continuing education so rewarding: through lifelong learning, we have the chance to improve ourselves.

But while the *intent* behind CE might be commendable, the CE and annual *reporting* experiences established by Engineers and Geoscientists BC have not been perfect; some registrants have told us that they felt the reporting process was challenging and unclear. We're listening. We know there were some bumps along the way, and we want to learn more. Soon, we expect to launch a survey that will help us better understand your pain points and how we can improve reporting in future years.

We're new at this too, and the philosophy of lifelong learning means that we're examining how we can do better, and we're thinking about ways we can improve how registrants report.

The real strength of lifelong learning—which forms the very heart of CE—is the belief that there is always something more to learn and always ways we can improve. For registrants, the goal is to acquire knowledge and skills that help protect the public interest. We want to support registrants in their pursuit of lifelong learning; and, in the short-term, that means learning how reporting can be made simpler and easier.

Heidi Yang, P.Eng., FEC, FGC (Hon.)

CEO, Engineers and Geoscientists BC

INNOVATION

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ENGINEERS AND GEOSCIENTISTS BRITISH COLUMBIA
Suite 200 - 4010 Regent Street, Burnaby, BC Canada V5C 6N2
Tel: 604.430.8035 Fax: 604.430.8085
Email: info@egbc.ca Web: egbc.ca
Toll free: 1.888.430.8035

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ENGINEERS AND GEOSCIENTISTS BC ANNOUNCES CANDIDATES FOR ELECTION TO COUNCIL

Engineers and Geoscientists BC is governed by a council of elected registrants and government appointees and is accountable to the public, overseeing the governance and management of the organization. The organization's Nomination Committee is responsible for selecting candidates to stand for election to Council, following a comprehensive and rigorous merit-based process that seeks strong and diverse leaders that reflect the organization's registrant base.

The Nomination Committee announces the following candidates for 2022:

Candidate	Discipline	Location
PRESIDENT		
Mark Adams, P.Eng.	Mining	North Vancouver
Michelle Mahovlich, P.Eng., P.Geo.	Civil	Langford

Candidate	Discipline	City
COUNCILLOR (TWO TO BE ELECTED)		
Karen Ling, P.Eng.	Civil	Vancouver
Mahsoo Naderi, P.Eng.	Civil	West Vancouver
Julius Pataky, P.Eng.	Electrical	Vancouver
Mark Porter, P.Eng., Struct.Eng., FEC	Structural	Coquitlam
Jeremy Vincent, P.Geo.	Geological	North Vancouver

Last year's election marked Council's transition to a reduced size of 12 as required by the *Professional Governance Act*.

SELECTION PROCESS

The Nomination Committee sought candidates through ongoing communication in eNews, *Innovation*, and online, and through direct outreach to potential candidates. Candidates were selected by the committee through a merit-based process that considered their demonstrated skills in leadership, strategy, financial literacy, risk management, human resources, regulatory understanding, governance, and technical proficiency.

PRESIDENT AND VICE PRESIDENT

This year, the Nomination Committee has nominated five candidates for councillor and two candidates for president. Council will also appoint one of its elected members to serve as vice president. This governance best practice is well-established in similar organizations and will enable Council to select a vice president who can best meet the needs of the Council in any given year.

ELECTION DATES

Council election will open by Thursday, September 1, 2022, and will close on Friday, September 30, 2022 at 12 PM. All registrants in good standing, including trainees, are eligible to vote. For more information, visit *egbc.ca/Council-Election*.

COUNCIL ELECTION 2022: HOW AND WHEN TO VOTE

An email will be sent to registrants by Thursday, September 1, 2022, with instructions on the electronic voting procedure. Voting will be conducted securely and anonymously, using systems contracted from Simply Voting Inc. Only electronic voting will be available.

Eligibility	All registrants and trainees in good standing: P.Eng., P.Geo., P.L.Eng., P.L.Geo., EIT, GIT
Election Opens	By September 1, 2022
Voting Ends	Noon on September 30, 2022
Results Published at *egbc.ca/Council-Election*	By approximately October 3, 2022

DID YOU MISS THE DEADLINE FOR CONTINUING EDUCATION AND ANNUAL REPORTING REQUIREMENTS?

The deadline for registrants to complete their Annual Reporting and Continuing Education Program requirements was June 30. While Engineers and Geoscientists BC commits itself to gathering more information from registrants and improving our reporting processes, registrants who did not meet the deadline must complete their requirements and pay late fees by September 30 to avoid suspension. For questions about your these requirements, visit *egbc.ca/Annual-Reporting* or email *AnnualReporting@egbc.ca*.

ANNUAL REPORTING: WHAT IS IT?

Annual Reporting requires registrants to verify their contact and certain practice-related information and complete declarations every year. Completing the Annual Reporting process is a requirement for **all registrants**, including practising, non-practising, retired, and trainee (EIT and GIT) registrants. Annual Reporting is a different process from reporting continuing education.

HOW DO I COMPLETE ANNUAL REPORTING REQUIREMENTS?

If you missed the deadline and need to complete your Annual Reporting, visit *egbc.ca/Annual-Reporting* or log in to your account and complete the simple five-step process. To confirm your information has been submitted, look for the green rectangular box with a green checkmark in the Annual Reporting section of your account, and check to ensure you receive a confirmation email.

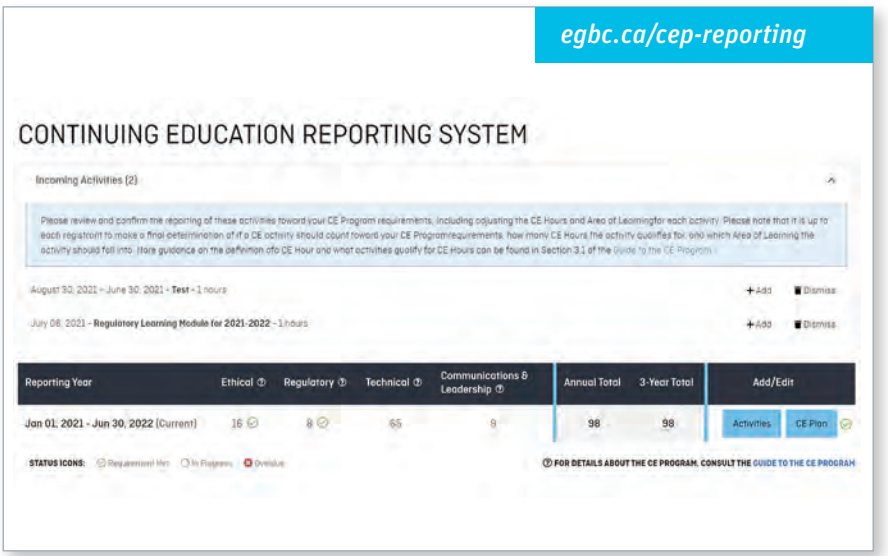
CONTINUING EDUCATION

Practising registrants and Practising Life Members must also complete and report their Continuing Education (CE) activities before completing their Annual Reporting requirements.

To ensure you have completed your CE Program requirements, navigate to *egbc.ca/cep-reporting*, and look for a green check mark next to the Ethical Learning hours, Regulatory Learning hours, and the CE Plan button. More information on the CE reporting requirements, including a step-by-step video, can be found at *egbc.ca/Continuing-Education*.

egbc.ca/Annual-Reporting

egbc.ca/cep-reporting



LATE FEES

If you did not complete Annual Reporting by June 30, you will be required to pay a $100 late fee upon completion of your Annual Reporting. If you did not complete the CE Program requirements by June 30, you will be required to pay an additional $200 late fee upon completion of your Annual Reporting. Registrants must report their CE activities (if applicable), complete the Annual Reporting process, and pay late fees by September 30.

PROFESSIONAL GOVERNANCE ACT AMENDMENTS APPROVED

On June 2, proposed amendments to the *Professional Governance Act* (PGA) were approved by the BC Legislature. The PGA governs Engineers and Geoscientists BC and several other regulators in the natural and built environment.

The changes are intended to improve oversight of the professions and draw from recommendations made in recent reviews of professional governance models in the health and legal professions. This includes:

- the ability for regulatory bodies to address non-compliance with administrative requirements (e.g., information reporting) outside of complex and lengthy investigations;
- an updated definition of "firms" that clarifies regulated firms include those where the regulated practice is carried out for internal purposes;
- updated terminology to reinforce the regulatory role of organizations under this legislation, including changing the name "Council" to "Board" and "President" to "Chair";
- ensuring that the *Act* does not affect Indigenous traditional knowledge or practices by clarifying that a person exercising the rights of an Indigenous people is not subject to the prohibition regarding reserved practice; and
- updates to declaration requirements based on feedback that the previously proposed requirement for registrants to submit declarations every time they were engaged to provide services was overly burdensome. The amendments will now require a regulation to be made for more specific instances where declarations add value.

PHOTO: 2009FOTOFRIENDS/SHUTTERSTOCK.COM

The changes also allow more professions to be brought under the legislation in the future, including the Architectural Institute of BC, which will be brought under the PGA later this year.

The amendments also enable the creation of an annual fee paid by regulatory bodies to offset a small percentage of the budget of the Office of the Superintendent of Professional Governance (OSPG). Additional work is required by the OSPG to determine whether this authority will be used, and on what basis; the OSPG has committed to continued consultation with regulatory bodies on any potential funding models in advance of a new regulation being introduced.

Engineers and Geoscientists BC is now working to interpret and reflect these changes in its Bylaws and will continue to inform registrants as these changes come into force.

Correction

In the May/June 2022 edition of *Innovation* Magazine, on Page 34, a Project Highlights submittor inadvertently misspelled the name of a participant company, and *Innovation* Magazine included the error. The company name should have read "Kontur Geotechnical Consultants". *Innovation* regrets the error.

CBC Radio's Anna Maria Tremonti.

ANNUAL CONFERENCE TO FEATURE VETERAN CANADIAN JOURNALIST AND FIRST INUK NHL PLAYER AS KEYNOTE SPEAKERS

Engineers and Geoscientists BC's virtual Annual Conference, scheduled for October 12 and 13, 2022, will feature highly anticipated keynote addresses by Anna Maria Tremonti, journalist, podcaster, and host of CBC Radio's *The Current*, and Jordin Tootoo, former ring-wing NHL player—the first Inuk player in the NHL—and Founder of the TooToo Foundation.

Anna Maria Tremonti spent her career at the forefront of Canadian and world events. She sees the patterns in how the world is evolving, anticipates what will make an impact, and identifies the resulting chain reactions that will shape our future. In her keynote address, *Connecting the Dots: Current Events to Future Opportunities*, Tremonti will share her perspectives on where we've come from, the relevance of our current era, and the direction she senses for our future to help you and your organization make connections.

Tootoo spent 13 years as an NHL player and Olympian. In his talk, *Motivation to Stay On-Side–Insights on Leadership and Teamwork*, Mr. Tootoo explains how you can bring the momentous joy of tearing across the ice to your team, and shares galvanizing insights on leadership and creating a culture of exceptional teamwork.

Tremonti and Tootoo are scheduled to speak on October 12 and October 13, respectively.

Other conference features include 28 Continuing Education sessions, the chance for registrants to accrue up to 40 Continuing Education hours, a virtual tradeshow highlighting industry trends and new technology, and networking opportunities.

A number of conference packages are available for registrants, including the All-Access Conference Package, a Wednesday Conference Package, and a Thursday Conference Package. Early pricing and group discounts are available.

Registrants and other participants can attend the 2022 virtual Annual Conference from anywhere in the world. For more information or to register, visit *egbc.ca/Conference*.

REGISTATION FOR OCTOBER 15 VIRTUAL ANNUAL GENERAL MEETING CLOSING SOON

The 2022 Engineers and Geoscientists BC Annual General Meeting (AGM) will be held virtually on October 15, 2022, at 8:30 AM. The AGM is an opportunity for registrants to hear from Council and senior staff on the organization's strategic progress, key initiatives, and financial standing, and debate motions brought forward for Council's consideration.

The deadline for submitting motions for consideration at the AGM is September 14, 2022, 5 PM. Before submitting a motion, please read the Motion Submission Guide. If you wish to submit a motion, please complete the Motion Submission Form. The Motion Submission Guide and the Motion Submission Form are provided at *egbc.ca/agm*.

All registrants are encouraged to attend and participate. Students, and members of the public are welcome to attend as observers. However, all participants must pre-register to attend the AGM by October 10, 2022 at 5 PM.

For more information or to register, visit *egbc.ca/agm*.

Photo: Mike Crane Photography

NEW CHIEF REGULATORY OFFICER AND REGISTRAR APPOINTED

Engineers and Geoscientists BC is pleased to announce the appointment of David Pavan, R.Ph., as the organization's new Chief Regulatory Officer and Registrar, effective July 18, 2022. In this role, David will oversee the organization's regulatory functions for both individual and firm registrants, including admissions, registration, practice standards, enforcement, legislation, and investigation and discipline.

David is a registered pharmacist with a strong background in professional regulation. He has extensive management experience in the pharmacy industry and has provided strategic leadership and oversight of regulatory functions in highly regulated organizations throughout his 28-year career.

"After an extensive search, I'm very pleased to be welcoming David to the organization," said Heidi Yang, P.Eng., FEC, Engineers and Geoscientists BC's Chief Executive Officer. "David has a strong track record of regulatory expertise and an in-depth understanding of policy and legislation. He's a collaborative leader who will be a strong addition to our team as we seek to become a more inclusive, progressive, and future-focused regulator."

Most recently, David served as the Deputy Registrar for the BC College of Pharmacists, where he was responsible for the organization's registration, licensure, practice review, quality assurance, complaints, and investigation functions. During his 6 years with the College, he also built collaborative relationships across multiple organizations and health authorities, experience that will be an asset to Engineers and Geoscientists BC as we seek to collaborate with our partners under the *Professional Governance Act* to strengthen effective regulation, responsiveness and decision making.

"I am excited to have the opportunity to join the team at Engineers and Geoscientists BC in this new era of professional regulation," David said. "I feel privileged to serve the public in this important role as a regulator."

Prior to his time with the College, David built progressive leadership in provincial pharmacy operations, including serving as the Operations Specialist for Shoppers Drug Mart with accountability for operational efficiencies, store standards, acquisitions, regulatory compliance, and complaints for 87 stores across the province. He also served as a Board Member and President of the BC Pharmacy Association.

Engineers and Geoscientists BC sincerely thanks Mark Rigolo, P.Eng.—who served as the organization's Acting Chief Regulatory Officer and Registrar following the retirement of Tony, Chong, P.Eng., from this position in early 2021—for his leadership, dedication, and expertise during this transition. Mark will continue to support the organization's operations in his role of Director, Programs and Professional Development.

JUNE 17, 2022

Engineers and Geoscientists BC's Council of elected registrants and government representatives meets throughout the year to conduct the business of organizational governance. The following are the highlights of its June 17, 2022 meeting.

VICE PRESIDENT APPOINTMENT POLICY UPDATED

In 2021, Council approved a governance structure whereby the vice president is appointed by Council from the elected registrant councillors. This governance best practice is well-established in similar organizations and will enable Council to select a vice president who can best meet the needs of the Council in any given year.

Beginning with the 2021/22 Council term, Council selected one of its elected Councillors to serve as vice president for a one-year term. Following this inaugural selection process, Council made a number of changes to its Vice President Appointment Policy to add additional clarity and structure to the selection process.

MEETING RULES APPROVED FOR 2022 ANNUAL GENERAL MEETING (AGM)

Council approved the Meeting Rules for the 2022 AGM, which will be taking place virtually on October 15, 2022. The rules outline procedural considerations to support a virtual meeting, including attendance and voting protocols, and how registrants can submit motions for consideration by Council.

To support a more efficient meeting, Council will approve the AGM agenda in advance of the meeting. Council will also approve the minutes of the meeting, following a feedback period to enable attendees to offer corrections or amendments. While these items have previously been approved by meeting attendees during the AGM, both are considered procedural in nature. Registrants may still bring forward motions for debate and consideration by Council as part of the meeting's agenda. For additional information on the AGM, see Page 9.

PHOTO: SONGQUAN DENG/SHUTTERSTOCK.COM

CLIMATE CHANGE ACTION PLAN UPDATE

Council received an update on the organization's progress towards the goals in its Climate Change Action Plan. Since the release of the Plan in early 2021, there has been significant progress made on the implementation actions identified in the Plan, most notably, the inclusion of climate action as one of the pillars under the organization's new Strategic Plan.

A three-year timeline of activities to fully implement the Plan was presented to Council. This included additional work being undertaken to advance actions related to the incorporation of climate change into engineering and geoscience competencies for professional registration and supporting firms in addressing climate change and sustainability in their work. For additional information on Engineers and Geoscientists BC's climate change and sustainability initiatives, visit *egbc.ca/Climatechange*.

These guidelines, and other professional practice guidelines and practice-related resources, are provided at egbc.ca/Guidelines.

NEWLY PUBLISHED PROFESSIONAL PRACTICE ADVISORIES

egbc.ca/Guidelines

Practice Advisory: Electrical Considerations for Decarbonizing Existing Part 3 Buildings

This *Practice Advisory: Electrical Considerations for Decarbonizing Existing Part 3 Buildings* has been issued for engineering professionals who provide professional services, such as design and field reviews, for retrofitting electrical systems to support decarbonization of existing buildings classified under Part 3 of the British Columbia Building Code. While this practice advisory addresses existing buildings, the information about load planning and technological considerations are also relevant to new buildings.

Practice Advisory: Requirements for Providing Building Demolition Services

This *Practice Advisory: Requirements for Providing Building Demolition Services* has been issued to guide engineering professionals on expectations and obligations of professional practice when providing services related to planning and executing demolitions of the primary structural systems of buildings. Recent collapses and demolition-related incidents have resulted in serious injury and loss of life; to ensure demolition planning and work is performed in alignment with current legislation this advisory helps clarify the role of engineering professionals who are engaged to provide services in this area of practice.

ARCHIVED WEBINARS

egbc.ca/Online-Learning/Products

Recorded webinars have been posted for each of the eight Quality Management Guides in the Bylaws of Engineers and Geoscientists BC:

- Guide to the Standard for Direct Supervision
- Guide to the Standard for Documented Checks of Engineering and Geoscience Work
- Guide to the Standard for Documented Independent Review of High-Risk Professional Activities or Work
- Guide to the Standard for Documented Independent Review of Structural Designs
- Guide to the Standard for Documented Field Reviews During Implementation or Construction
- Guide to the Standard for Retention of Project Documentation
- Guide to the Standard for the Authentication of Documents
- Guide to the Standard for the Use of Professional Practice Guidelines

The Quality Management Guides, and webinars associated with each guide, are available on-demand on the Engineers and Geoscientists BC website, at *egbc.ca/Quality-Management-Guides*. The webinars can be incorporated into registrants' Continuing Education planning.

FREQUENT PROFESSIONAL PRACTICE INQUIRIES

Do I need a permit to practice if I'm working as a sole practitioner outside of my normal employment??

With the introduction of the Regulation of Firms program in 2021 under the *Professional Governance Act*, the ability of individual registrants to use their seal for personal use (e.g., for structural design of their own home, or for work for friends or family members), or for contribution to projects outside of their day-to-day employment has changed.

Under the Regulation of Firms program, all firms that engage in the practice of professional engineering or geoscience are required to have a Permit to Practice issued by Engineers and Geoscientists BC. Registrant Firms are permitted to carry out the reserved practice of professional engineering or professional geoscience; entities that are not Registrant Firms may not carry out reserved practice.

If an individual registrant engages in the practice of professional engineering or professional geoscience on a personal basis, or outside of their day-to-day employment with a Registrant Firm (a firm which hold a Permit to Practice), they are effectively operating as a "sole practitioner" as defined in the Bylaws of Engineers and Geoscientists BC: "*a Professional Registrant who practises on their own, either in an incorporated or unincorporated manner*". A Permit to Practice is mandatory for all firms in BC that provide services requiring the practice of professional engineering and/or professional geoscience, including both incorporated and unincorporated sole practitioners.

Registrant Firms must apply their permit number to all authenticated documents; authenticated documents lacking a permit number do not meet the Bylaw requirements may be rejected by the receiving party including clients, regulatory authorities, and/or approving authorities.

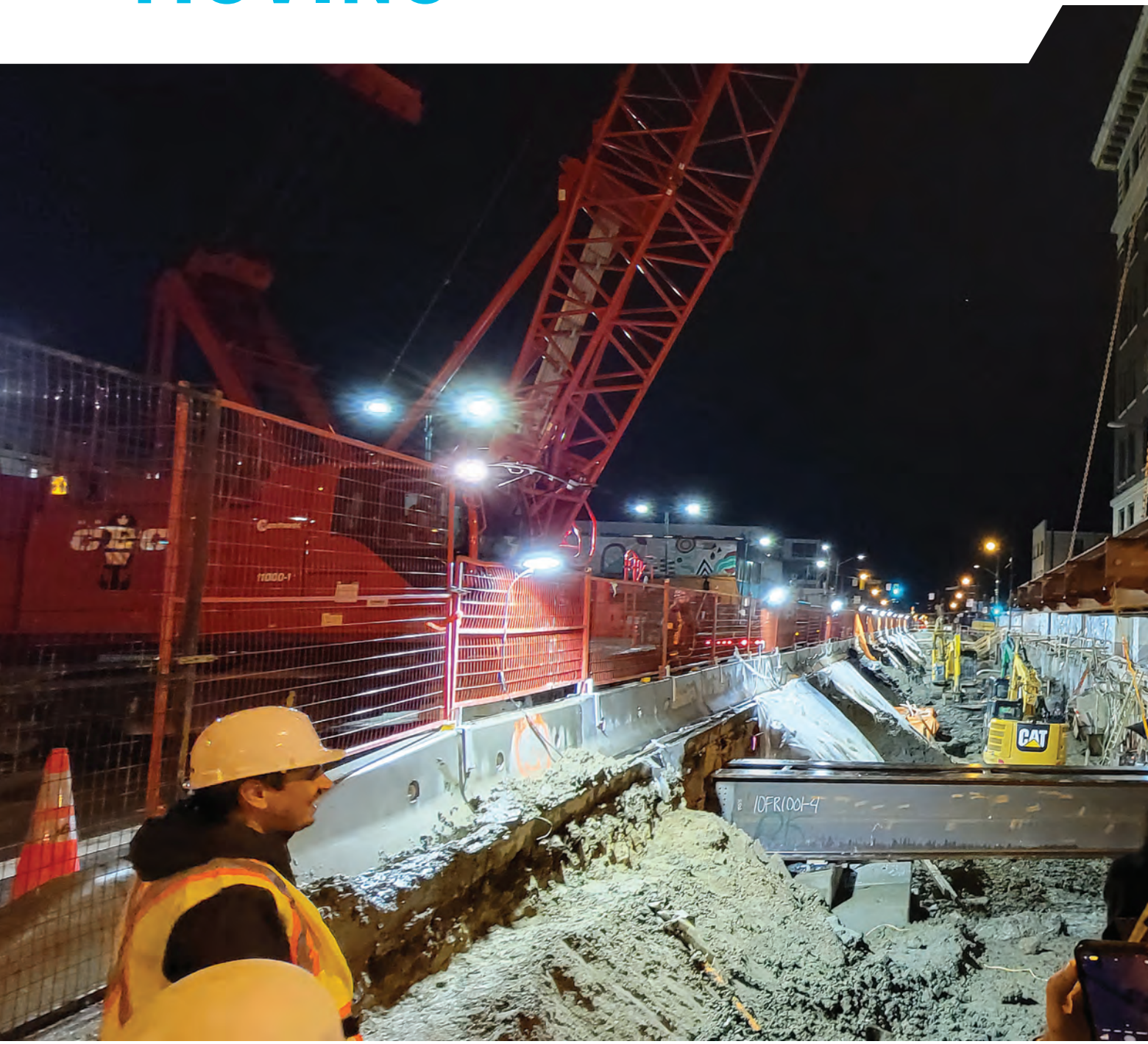
Engineers and Geoscientists BC has published a technical bulletin relevant to this topic—Permit to Practice Number Usage (found at *egbc.ca/Firms*)—which provides additional guidance on the use of permit numbers.

Additional information on the Regulation of Firms program is provided at *egbc.ca/Firms*.

Alice Kruchten, P.Eng.
Practice Advisor

KEEPING THE **BROADWAY CORRIDOR MOVING**

AMY HAAGSMA



By now, many Vancouver residents and businesses will have noticed the activity (and disruptions) surrounding a major corridor on Broadway Avenue in Vancouver. That's because the area is now the site of one of the largest (and costliest) infrastructure projects in recent memory: the Broadway Subway Project. And while the project has stirred some local inconvenience and concern, the province and a host of others believe that the long-term benefits significantly outweigh the costs.

Photo: BC Ministry of Transportation

A rendering of the planned Arbutus Station.
Photo: BC Ministry of Transportation

Photo: BC Ministry of Transportation

PROJECT SCOPE

The Broadway Subway Project is a 5.7-kilometre extension of the Millennium Line SkyTrain from VCC-Clark Station to the future Arbutus Station at Broadway and Arbutus Street. It is expected to reduce travel times, relieve congestion, and triple the system's current capacity in the area. The project includes a 700-metre above-ground guideway from VCC-Clark Station to a new underground station at Great Northern Way near Emily Carr University of Art + Design, and a 5-kilometre tunnelled section with another 5 underground stations.

The extension also represents the first phase of a larger project to build out rapid transit to UBC and features a new bus loop at Arbutus Station that will connect with the 99 B-Line. A second phase that would extend the SkyTrain line fully to UBC is currently in the planning stage.

The project is being delivered under a design-build-finance contract by Broadway Subway Project Corporation, a joint venture of Acciona Infrastructure Canada Inc. and Ghella Canada Ltd. Delivery of the project is being led by Transportation Investment Corporation on behalf of the Ministry of Transportation and Infrastructure; when complete, the Broadway Subway will be operated and maintained by TransLink.

The overall project cost is $2.83 billion, with contributions of $1.83 billion from the provincial government, $897 million from the federal government, and $100 million from the City of Vancouver in the form of land.

Construction planned for this year includes the columns for the elevated guideway, traffic decks at the station locations on Broadway, excavation of the underground stations, and the launch of the tunnel boring machines (TBMs). The new line is scheduled to open in 2025.

MASS TRANSIT RELIEF FOR A BUSY CORRIDOR

The Broadway corridor is "a really important corridor," says Alex Malyuk, P.Eng., Associate Project Director of the Broadway Subway Project. More than 125,000 people live within the corridor, which also provides 105,000 jobs and is home to Vancouver General Hospital, the largest hospital in Western Canada.

The corridor already sees 110,000 transit trips each day, with B-Line buses running every three minutes. Still, the system cannot keep up with demand—the 99 B-Line has nearly 500,000 passenger "pass-bys" each year (i.e., when buses are too full to accept more passengers), leading to trips that are unreliable and inconsistent. According to Alex Malyuk, "One of the main reasons we're building this new line is to provide the necessary additional capacity to the transit system, which will result in significantly faster and more reliable travel times." Improving the transit experience will also result in environmental benefits due to more people choosing to use transit over driving.

MAINTAINING ACCESS DURING CONSTRUCTION THROUGH TRAFFIC DECKS AND TUNNEL BORING

One major factor in the planning of the project was the need to ensure that the corridor remained open to at least some traffic, and that businesses—many of which could not withstand a long-term closure—could still be accessed. "With the construction of a substantial piece of public infrastructure like the Broadway Subway Project, the unique challenge to solve is how to build it efficiently while ensuring that the Broadway corridor continues to serve the needs of the public," says Alex Malyuk. "We need to keep the buses and travelling public moving during construction, and we need to ensure that businesses are accessible and [the corridor] is still able to function throughout the construction period. . . . All of the key reasons the project needs to be built now are also all of the things we need to ensure are effectively supported while it's being built."

Surface construction is now underway along Broadway at the station locations. Phased construction sequencing and lane closures and a unique traffic-decking system will be employed to keep traffic moving during construction.

TRAFFIC DECKS AT STATION LOCATIONS

"One of the unique engineering solutions that was developed for this project was the idea of temporary traffic

decks at each of the station locations along Broadway," says Alex Malyuk. The decking is installed at grade to maintain operations and access at the street level; traffic continues to flow above the stations while excavation and construction take place below. The traffic decks will accommodate four lanes of traffic throughout construction, two in each direction, with priority for buses and emergency vehicles. Between stations, the six existing lanes on Broadway will remain in place, with curb lane priority for buses to ensure on-time operation.

BORED TUNNELS FOR THE UNDERGROUND SECTION

Another engineering solution aimed at minimizing impact to the public was the decision to use two earth pressure balance (EPB) TBMs for the underground section rather than cut-and-cover along the entire alignment. "On the Canada Line project . . . the approach was cut-and-cover for large sections of Cambie [Street]. . . . That caused subsequent impacts to businesses and to access, so for Broadway we flipped the solution on its head a little bit," says Alex Malyuk. This led to a design solution that significantly reduces construction activities at the street level compared with cut-and-cover.

The TBMs will be launched at Great Northern Way–Emily Carr Station and disassembled and recovered at Cypress Street near Arbutus Station. They will operate at an approximate depth of 15 metres below ground, to a maximum depth of 20 metres at Broadway–City Hall Station, advancing on average 18 metres per day. Components of the TBMs have been shipped from Germany and are being staged and assembled in Vancouver; boring is expected to begin this summer and will take approximately one year.

Each TBM is six metres in diameter and 150 metres long (longer than the

Continues on page 24...

Workers assemble a Herrenknecht six-metre EPB shield TBM for Singapore's underground metro project. Photo: Courtesy of Herrenknecht.

ABOUT TUNNEL BORING MACHINES

"Teams!" exclaimed Basher, in the film *Oceans Thirteen*, when he's asked how many staff are usually needed to operate a tunnel boring machine (TBM). The truth is that, at best, it's not possible to operate a TBM without the right number of staff. Nor is it possible for a TBM to simulate an earthquake, or for a secondhand TBM to simply be shipped on a flatbed truck and then be offloaded and prepped in about a day. *Oceans Thirteen* might be a good film, but it shouldn't be relied upon for accurate information about TBMs.

TBMs are designed to bore tunnels as an alternative to classic drilling/excavating methods. The two TBMs planned for the Broadway Subway project—earth pressure balanced (EPB) shield models—were custom-manufactured in Germany and have been shipped in portions and reassembled in BC. The diameter of these EPB TBMs range from about 67 inches up to about 630 inches; they are especially suited for soft-soil conditions, and for tunnels that must be constructed in urban areas without disturbing residences or traffic above. Herrenknecht's EPB shield models have been used in projects such as the 111-kilometre Doha Metro project in Qatar, and the Grand Paris Express project, and the Crossrail project in London—which bored drove beneath Soho, Hyde Park, and some of the most expensive real estate in the world.

An EPB shield TBM features a front-facing cutting wheel, and uses continuously applied pressure to excavate the tunnel and push excavated soil up a screw conveyor. The TBM cutting section leaves behind a smooth surface, which the TBM immediately lines with prefabricated concrete segments using a hydrauilic crane arm. The use of EPB shield TBMs on the Broadway Subway project—which will be given names and placed into operation in the summer of 2022—are key to the project's intent to maintain traffic and minimally distrupt businesses overhead.

ENGINEERS &
GEOSCIENTISTS
BRITISH COLUMBIA

OCTOBER 12–13, 2022 | VIRTUAL CONFERENCE

2022 ENGINEERS AND GEOSCIENTISTS BC ANNUAL CONFERENCE

The 2022 Engineers and Geoscientists BC Annual Conference is returning virtually on October 12–13, 2022. Join us for two days of topical continuing education sessions, keynote speakers, networking opportunities, activities and gamification, and a virtual tradeshow. The conference offers the opportunity for professionals to gather alongside like-minded engineers, geoscientists, technologists, academics, government representatives, and industry leaders—and its virtual format allows attendees to join from anywhere.

KEYNOTE SPEAKERS

WEDNESDAY, OCTOBER 12, 2022

Connecting the Dots: Current Events to Future Opportunities
Anna Maria Tremonti, Journalist, Podcaster & 17 Season Host of "The Current"

Anna Maria Tremonti has spent her career at the forefront of Canadian and world events. She sees the patterns in how our world is evolving, anticipates what will make an impact, and resonate with humanity, and the resulting chain reactions that will shape our future. She'll share her perspectives on the context of where we've come from, the relevance of our current era, and the direction she senses for our future to help you and your organization make connections.

Key Takeaways:

- How to find good quality information and resources you can trust.
- The ways human interaction can be used to positively affect the future.
- How to empower others to live differently and connect their own dots.

THURSDAY, OCTOBER 13, 2022

Motivation to Stay On-Side—Insights on Leadership and Teamwork
Jordin Tootoo, The First Inuk Player in the NHL,
Founder of the Team Tootoo Foundation

For thirteen years, Jordin Tootoo traveled the world as a professional hockey player, in the NHL and the Olympics, getting insufficient sleep, body-checked, and pushing himself to extremes. Still, he never stopped wanting to extend himself. In this talk, Tootoo explains how you can bring the momentous joy of tearing across the ice to your team, remembering the passion and drive to win when the daily tasks threaten to make you forget the big picture. In an exciting and inspiring talk based on his years on and off the ice, Tootoo shares galvanizing insights on leadership and creating a culture of exceptional teamwork.

ANNUAL GENERAL MEETING

Saturday, October 15, 2022
8:30 AM–12:00 PM

The AGM is free to attend, but registration is mandatory by Monday, October 10, 2022, at 5:00 PM, Pacific Time. The AGM is hosted separately from the Annual Conference. For more information and to register, visit **egbc.ca/agm**.

CONTINUING EDUCATION

The 2022 Engineers and Geoscientists BC Annual Conference will bring together engineers and geoscientists from all over the province for a virtual learning and networking experience.

During the conference, registrants can accrue up to 40 Continuing Education Hours by attending:

- Live presentations (8 CE hours)
- Breakout sessions' recordings (28 CE hours)
- 2 keynote presentations (2 CE hours)
- 2 keynote recordings (2 CE Hours)

Breakout sessions and keynotes will be available on demand. Please see conference packages for details.

WEDNESDAY, OCTOBER 12, 2022

Municipal Engineering Stream

Infiltration & Inflow (I/I) in 2022: A Brave New World | *Barbara Robinson, P.Eng. and Dan Sandink*

Maintenance of Traffic: Innovation and Efficiency in High Density Area | *Sylvie Gervais, P.Eng.*

Engineering and Geoscience in the Resource Sector Stream

The 2021 British Columbia Atmospheric River Disaster | *Dr. John Clague, P.Geo., FGC, FEC (Hon)*

Cosmic-ray Muon Tomography: Helping the Mining Industry Drill Less and Discover More | *Dr. Douglas Schouten*

Climate Change Stream

BC Heat Dome: Impacts, Response and Recovery | *Rachel LaFortune, Harshan Radhakrishnan, P.Eng., Christy Love, P.Eng., and Magda Szpala*

Bridging Silos in Design Teams, One Climate Indicator at a Time | *Elise Paré, P.Eng. and Morgan Tidd, P.Geo.*

Better Business Stream

Trials and Tribulations: The Professional Liability Insurance Claim | *Daniela Fuda, Madison Britz, and Marlowe Mercado*

Negotiations Excellence | *Joanna Shea and Scott Tillema*

Regulatory Affairs Stream Day 1

Professional Practice Tools for Professionals Working Remotely | *Allison DenToom, P.Eng. and Charles Tremblay*

How Engineers and Geoscientists Get in Trouble | *Jesse Romano, Efrem Swartz, LLB and Rohan Hill*

Diversity and Inclusion Stream

Case Study: Working Towards an Equitable Parental Leave Policy | *Susan MacDougall, P.Eng.*

Allyship and Acknowledgments | *Kear Porttris, EIT and Natasha Parrish*

THURSDAY, OCTOBER 13, 2022

Environmental Engineering and Geoscience Stream

Development of Making Space for Urban Green Infrastructure: Inter-Disciplinary Design | *Osvaldo Vega, P.Eng. and Nick Mead-Fox, P.Eng.*

Environmental Monitoring using Earth Observation and Augmented Reality | *Matt Murdoch, P.Eng., William Parkinson, and Gerald Magnusson*

Energy Efficiency and Renewable Energy Stream

Getting to Zero: Decarbonizing UBC's District Energy System | *Julie West, P.Eng. and David Trigg, P.Eng.*

Offsets: An Important Revenue Stream on the Road to Net Zero | *Nelson Lee, P.Eng.*

Structural Engineering Stream

NBC 2020—Changes to Seismic Design Provisions | *John Sherstobitoff, P.Eng.*

Structural and Fire Considerations for Encapsulated Mass Timber Construction | *Grant Newfield, P.Eng., Struct.Eng.*

Innovative Solutions and Technologies Stream

Concerned Software in Your Projects | *Simon Diemert, P.Eng.*

Managing Geohazard Risk with Cambio | *Eldon Wong, P.Eng. and Sarah Newton, P.Eng. (Alberta)*

Communications and Leadership Stream

Thriving in Changing Times | *Carolyn Stern*

10 Essential Team Needs to Combat Burnout | *Beverly Beuermann-King*

6 Things You Need to Lead Through Change | *Renée Safrata*

Leading High Performing Teams | *Nic Tsangarakis*

Emerging Professional Stream

Successfully Developing Professionals into Leaders and Managers | *Dani Delaloye, P.Eng., Chris Mealing, P.Eng., Homayoun Vahidi, P.Eng., Amy Tsou, Peter Procter, P.Eng., and Selena Wilson, P.Eng.*

Teach the Geek to Speak: Presenting to Non-technical Audiences | *Neil Thompson*

Regulatory Affairs Stream Day 2

The *Professional Governance Act* (PGA) Implementation: What Have We Heard and What Have We Learned | *Lindsay Steele, P.Geo. and Megan Archibald*

Professional Practice Guidelines: Equity, Diversity and Inclusion | *Marcie Cochrane, P.Eng.*

Sessions are subject to change. For the most recent CE Program descriptions and sessions, visit **egbc.ca/conference**.

CONFERENCE PACKAGES

All prices are subject to GST. Early Bird deadline: Monday, September 12, 2022, 5:00 PM, Pacific Time.

ALL-ACCESS CONFERENCE PACKAGE *(Wednesday and Thursday)*	**EARLY BIRD PRICING**	**REGULAR PRICING**
• 8 live conference sessions, including 2 featured keynotes • Up to 40 CE Hours: live presentations (8 CE Hours), all the breakout sessions' recordings (28 CE Hours), 2 keynote presentations (2 CE hours), and 2 keynote recordings (2 CE Hours) • Live Q&As • Virtual tradeshow • Networking lounge • Games and prizes • Unlimited on-demand access**	**$250** *Student $100	**$325** *Student $100
WEDNESDAY CONFERENCE PACKAGE	**EARLY BIRD PRICING**	**REGULAR PRICING**
• 4 live conference sessions, including featured keynote • Up to 18 CE Hours: live presentations (4 CE Hours), all the Wednesday breakout sessions' recordings (12 CE Hours), keynote presentation (1 CE Hour), and keynote recording (1 CE Hour) • Live Q&As • Virtual tradeshow • Networking lounge • Games and prizes • Unlimited on-demand access**	**$175** *Student $50	**$225** *Student $50
THURSDAY CONFERENCE PACKAGE	**EARLY BIRD PRICING**	**REGULAR PRICING**
• 4 live conference sessions, including featured keynote • Up to 22 CE Hours: live presentations (4 CE Hours), all the Thursday breakout sessions' recordings (16 CE Hours), keynote presentation (1 CE Hour), and keynote recording (1 CE Hour) • Live Q&As • Virtual tradeshow • Networking lounge • Games and prizes • Unlimited on-demand access**	**$175** *Student $50	**$225** *Student $50

**Student Price is only eligible for students enrolled in the Engineers and Geoscientists BC Student Program.*

** *All breakout sessions will be available on-demand until January 31, 2023, unless otherwise specified. Keynote sessions will only be available on-demand until November 30, 2022.*

No refunds after Tuesday, September 27, 2022, 5:00 PM Pacific Time. A $20 administration fee will apply to all cancellations received prior to this day. For full cancellation policy, visit ***egbc.ca/conference****.*

GROUP DISCOUNTS

We are pleased to offer a group discount for three or more registrants from the same organization purchasing the same package. The more attendees you have and the earlier you register, the more you save!

GROUP DISCOUNT	**NUMBER OF PARTICIPANTS**
10%	3-4 participants
15%	5-6 participants
20%	7-9 participants
25%	10-11 participants
30%	12 or more participants

Group discounts apply to all packages. To learn more about group discounts, please contact ***conference@egbc.ca****.*

HOW TO REGISTER

Register today at **egbc.ca/conference** or contact **conference@egbc.ca**.
We look forward to seeing you at the 2022 Engineers and Geoscientists BC Annual Conference!

...Continued from page 19

length of a football field), weighing in at 907,185 kilograms (equivalent to about 333 elephants). They were custom-built by German manufacturer Herrenknecht based on the project alignment and grade, the expected site conditions, and the operational requirements. There will be 8 to 12 trained staff in each TBM to control it and monitor the vitals of the TBM operation.

CONNECTIONS TO EXISTING AND FUTURE TRANSIT INFRASTRUCTURE

In addition to the vast number of people and businesses within the Broadway corridor, there is also significant existing transit infrastructure. This includes the existing Millennium Line and its current terminus at VCC-Clark Station, the Canada Line, and the B-Line bus system.

The Broadway Subway Project will provide a continuation of the Millennium Line from VCC-Clark Station, connecting with the 99 B-Line to UBC via a new bus loop at Arbutus Station, the terminal station for the new line. Additionally, in the next phase of the project, the Millennium Line is planned to be extended all the way to UBC. To facilitate a smooth integration with the next phase of the project, the tail track will be mined a short distance west of Arbutus Station. Extending the tunnels past the station will allow tie-in of the future transit infrastructure without closures or impacts on transit users.

Another significant connection is the integration with the Canada Line at Broadway–City Hall Station. The two stations will be joined through below-grade passenger connections, allowing passengers on the Millennium Line an efficient transfer to the Canada Line, and vice versa, without needing to return to the street level. To achieve the complex station construction, including the mined passenger connections linking the two lines, the TBMs will tunnel underneath the Canada Line while it's in use.

PROJECT GOALS AND FUTURE DEVELOPMENT

The Broadway Subway Project is an important project for the BC Ministry of Transportation and Infrastructure and the City of Vancouver. It is intended to increase capacity and reduce travel time and congestion within the Broadway corridor, accommodating three and a half times as many riders as the 99 B-Line and reducing average total travel time between VCC-Clark Station and Arbutus Station by 11 minutes. Improving transit options also encourages a modal shift away from vehicle travel—the project is expected to eliminate approximately 13,000 vehicle-kilometres per year and facilitate an increase in transit mode share within the corridor to more than

40 percent by 2045. This in turn will lead to a net reduction of 164,000 tonnes of carbon dioxide by 2054.

Additionally, the project has triggered the development of the Broadway Plan, the City of Vancouver's comprehensive area plan for Central Broadway based on transit-oriented design principles. The plan identifies housing, job growth, and land use opportunities, as well as new public spaces, improvements to existing public spaces, community amenities, transportation infrastructure, and supporting utilities. The Broadway Plan is aimed at enabling more people to live and work in complete neighbourhoods close to rapid transit and will solidify Central Broadway as Vancouver's "second downtown." ◆

Photo: BC Ministry of Transportation

MINING AND EXPLORATION IN BC: CRITICAL ELEMENTS FOR THE FUTURE

NICOLE BARLOW, P.GEO.

The Intergovernmental Panel on Climate Change's February 2022 report (*www.ipcc.ch*) calls for drastic and urgent cuts to greenhouse gas emissions. And governments are making agreements, setting goals, and turning to mining—an industry not typically known for climate solutions—to help address climate change.

Aluminum casting at Rio Tinto's aluminum smelter in Kitimat.
Photo: Rio Tinto

Alongside the push towards decarbonization, the term "critical minerals" has entered the common vernacular and is synonymous with "minerals needed to support the transition to a green economy". Canada published its critical minerals list in March 2021, listing 31 minerals, many of which are not the standard base metals that investors—and geologists—are used to. The federal government also pledged $3.8 billion over 8 years to implement its Critical Minerals Strategy, which it hopes will "power the green and digital economy at home and around the world", according to its website.

And BC—known for its rich mineral endowment and strong focus on natural resources—is well positioned to make a difference in the critical minerals landscape.

BC'S ADVANTAGES

Kendra Johnston, P.Geo., president and CEO of the Association of Mineral Exploration, said our location close to overseas markets, reputation with investors and geoscience expertise are advantages. "We are a centre of excellence," she said, "for the knowledge that we have, the universities, the financial markets, the lawyers, the accountants, the people who are needed to make a new project go forward. We're also leaders on collaborative partnerships with Indigenous communities and economic reconciliation."

Martin Turenne, CEO of FPX Nickel, believes that the abundance of hydroelectric power gives BC an edge in the hunt for critical minerals, and Adrian Hickin, P.Geo., Chief Geologist of the BC Geological Survey, thinks that our environmental, social, and governance principles make BC a desirable region to explore.

PHOTO: INOMIN MINES

Right: Inomin Mines Director John Peters, P.Geo., examines core from the Beaver project, which Inomin reports contains 20.6% magnesium, 0.16% nickel, and 0.33% chromium. PHOTO: INOMIN MINES

"COPPER IS KING"

Johnston agreed. "The BC government worked hard with the federal government to ensure that copper was on the federal critical minerals list and that has been a game-changer for BC. There's so much copper exploration work happening in BC and there always has been ... it's what we're known for."

Pacific Ridge Exploration optioned the Kliyul copper-gold project from Centerra Gold Inc. in January 2020, which proved to be a good strategic decision. "When you combine increased copper demand with political, social, and environmental risk in South America, senior copper producers are a lot more interested in BC copper-gold porphyry projects... BC is very prospective for new copper-gold discoveries because we haven't seen a lot of porphyry exploration in the past decade,"

Photo: Giga Metals

said Blaine Monaghan, president, CEO, and director of Pacific Ridge.

Because BC has a long exploration history, many occurrences of copper have already been identified. Of the 15,528 mineral occurrences listed in the BC Geological Survey's MINFILE database, 8896 include copper. "BC has a lot of low-grade copper," said Turenne. "If we can find smarter ways to extract that copper with higher recoveries and lower costs, there's an opportunity to unlock the unrealized wealth in our copper endowment."

NICKEL: THE UP-AND-COMING STAR

Nickel is an important addition to Canada's critical minerals list because, by weight, it's the largest component in lithium-ion batteries used in electric vehicles and other infrastructure requiring high-capacity batteries.

FPX Nickel's Decar nickel project is in central BC. "In the right set of circumstances, we think that [Decar] could be a very large operating mine before the end of this decade," said Turenne. The deposit has some interesting qualities. The ore forms in a low-sulphur host-rock environment, so there are no acid rock drainage issues—"in fact, the waste rock and tailings will be acid consuming," Turenne says. The host rock also contains brucite, a magnesium hydroxide mineral that naturally sequesters carbon dioxide when exposed to air during mining. That means that this mine has the potential to be carbon neutral, especially if the mining fleet uses hydrogen fuel.

Inomin Mines' Beaver magnesium-nickel-cobalt deposit is in south-central BC. According to John Peters, P.Geo., director of Inomin Mines, the Beaver deposit was discovered using the BC Geological Survey's Regional Geochemical Survey (RGS) database and boasts the highest RGS nickel values in BC. With hydroelectric infrastructure in the area and brucite content in the host rock, this might also become a carbon-neutral mine.

Giga Metals Corporation's historical Turnagain nickel property is near Dease Lake and, according to their website, is among the largest undeveloped sulphide nickel deposits globally. The mine is being designed with an electrified fleet and carbon dioxide sequestration through brucite, making it another potentially net-zero mine.

MOLY AND BEYOND

All molybdenum in Canada is mined in BC. And BC has the potential to produce

many other minerals on Canada's critical minerals list as well. "I think perhaps where they're seeing the most potential … is in some of the old mine sites and some of the current mine sites—in the tailings dumps," said Johnston. In their paper "Specialty, Critical, Battery, Magnet and Photovoltaic Materials: Market Facts, Projects and Implications for Exploration and Development" (*Geoscience Canada*, 2021), Laura Simandl, EIT, and co-authors agreed: "Several specialty metals (e.g., germanium, indium, cadmium, and cobalt) are commonly obtained as by-product of base metal extraction. In such cases, systematic testing of base metal ores for their specialty metal content may justify the addition of relevant recovery circuits to existing smelters." Its extensive mining and exploration history, especially in these base metals, is where BC shines.

"BC has an exceptional mineral endowment—lots of good projects, lots of mineral potential," said Hickin. "The geological history dictates what mineral resources are available and we have a lot we can contribute. What we really don't know a lot about is where critical minerals fall within a mineral system."

Many commodities on the critical minerals list are not typically mined for and invested in. Monaghan said that this could make it difficult to attract investment. "Some of these critical minerals are quite exotic, a lot of geologists aren't very familiar with them, your average investor even less so. Companies will have to educate potential investors why they are exploring for these critical minerals and what a positive outcome might look like."

Johnston said we have fantastic geological experts in BC that can help with that education: "It's tapping into those people who have spent their careers working on various critical minerals to understand what it is that they've learned. It's making sure people have a platform to talk about what they're doing, about geological models, sampling procedures, and assay procedures."

PHOTO: GIGA METALS

Public geoscience is also crucial to disseminating research on these minerals and it de-risks research and development for industry. The BC Geological Survey is actively reviewing Canada's critical minerals list, according to Hickin, to highlight which minerals are most relevant to BC's economy and have already been identified in BC. Brady Clift, P.Geo., Manager, Minerals, Geoscience BC, a not-for-profit public geoscience organization, said, "Public geoscience information is

where it all starts. Researchers do the work and make it available so that industry can build on it and add value to it." Geoscience BC is also focused on providing R&D for industry. "We take the feedback from [the mineral exploration industry] on [what] they're investigating and where their interest lies to guide our future research," Clift said.

DOWNSTREAM POSSIBILITIES

Building for a green economy requires both geologists and engineers engaged throughout the supply chain—from exploration upstream to processing, refining midstream, and building infrastructure downstream.

According to Hickin, BC is not only focused on upstream potential. "We have mid-stream capacity here in BC … it's an important contribution to what happens here in our industry," he said. One mid-stream contributor is Teck's Trail Operations, which smelts and refines zinc and lead as well as critical mineral co-products of zinc, germanium and indium. Rio Tinto's aluminum smelter in Kitimat produces aluminum with one of the lowest carbon footprints in the world, thanks to a recent upgrade that cut their greenhouse gas emissions by 50 percent while doubling their production.

As for downstream (materials production) potential, Johnston said, "there's conversations happening about that—it's a possibility. There's a curiosity and a directionality towards that." Turenne said that "given the rise of the North American electric vehicle industry, we have a unique opportunity to build those facilities here and leverage off of the deep experience here in mining and processing and metallurgical refining."

Going a step further and looking to a circular economy, Retriev Technologies has a battery recycling facility in Trail, capable of recycling large battery packs from hybrid and electric vehicles.

ENVIRONMENT-SAVING MINING?

Mining is not traditionally thought of as an environment-friendly industry. But now, critical minerals are needed to

Giga Metals' Turnagain camp. Giga Metals reports that the Turnagain project contains about 18 percent nickel sulphide concentrate and about 1 percent cobalt. Photo: Giga Metals

reduce our continued dependency on fossil fuels. "Critical minerals are a great hook for the mining industry to promote itself," said Monaghan. Johnston said the need for critical minerals could change the public's view of the mining industry for the better, but "it needs to come from a place of understanding, education, knowledge, and relationships. Having that personal connection to someone who works in the mining industry who's really passionate about it is what's going to bring that message to the public."

Many people don't understand the importance of mining. Hickin said "we can't turn off the dependency on petroleum by flipping a switch … the public needs to understand where these things come from. When you buy an electric car, most of the moving parts are products of mining—they come from the earth. The sector has struggled with geoliteracy for many years now."

Turenne says that it goes beyond geoliteracy to responsible, sustainable mining. Just as people care about buying local, organically grown produce, "they should also have a bias for supporting responsibly sourced, locally mined material." This is a growing ethical responsibility to keep in mind as professional engineers and geoscientists when we develop projects and source materials.

We are at the precipice of something exciting, within both the mining industry and the global community. "You have a scenario in which all levels of society are pushing for a transition to a low-carbon economy. That includes government, investors, industry, and consumers," said Turenne. Hickin said, "As people see the importance of critical minerals to supporting this transition away from a carbonized economy, there's the opportunity to highlight that these things come from our resources … to get them out of the ground, you have to have a mine." ♦

The Intergovernmental Panel on Climate Change's February 2022 report can be found at *www.ipcc.ch/report/ar6/wg2*.

The paper "Specialty, Critical, Battery, Magnet and Photovoltaic Materials: Market Facts, Projections and Implications for Exploration and Development", by Laura Simandl, George J. Simandl, and Suzanne Paradis, can be found at *journals.lib.unb.ca/index.php/GC/article/view/32171/1882527748*.

Engineers and Geoscientists BC's website contains information on the complaint, investigation, and discipline processes. You can contact us at 604.558.6647 or toll-free at 1.888.430.8035 ext. 6647, or by email at *complaints@egbc.ca*. The full text of Consent Orders can be found in the Discipline Notices section of our website, at *egbc.ca/Discipline-Notices*.

DISCIPLINE NOTICE: DEEPAK VERMA

On May 31, 2022, Mr. Verma agreed to a Consent Order cancelling his registration with Engineers and Geoscientists BC. Mr. Verma is not permitted to practice engineering or use the title "Engineer" or "Professional Engineer" in BC.

The investigation against Mr. Verma arose following an audit of the competency-based assessment he submitted in support of his professional engineer application with Engineers and Geoscientists BC. The assessment included a summary of his education, his employment history, and an explanation of how his work experience satisfied several competences (the Assessment). Mr. Verma nominated six validators, two of whom were professional engineer registrants of Engineers and Geoscientists BC, to verify the information he reported in the Assessment.

Mr. Verma falsely represented himself as the two professional engineer validators to validate the Assessment. He created two fictitious email addresses and used the fictitious email addresses to access the Assessment and submit information in support of his application.

Based on the false representations, Mr. Verma's application for registration was initially approved on February 23, 2021, but later audited. The Registration department of Engineers and Geoscientists BC contacted the professional engineer validators as part of the audit, who confirmed the email addresses did not belong to them nor did they submit the information included in the Assessment.

On May 11, 2021, Engineers and Geoscientists BC notified Mr. Verma that the Investigation Committee had authorized an investigation to confirm whether Mr. Verma falsely represented himself as the professional engineer validators for the competency assessment. Mr. Verma then admitted to the false representations and resigned his registration on May 14, 2021.

In the Consent Order dated May 31, 2022, Mr. Verma admitted that by making the false representations, he demonstrated unprofessional conduct contrary to the *Engineers and Geoscientists Act*. Mr. Verma also admitted that maintaining his fraudulently obtained registration constituted professional misconduct contrary to the newly enacted *Professional Governance Act*. Mr. Verma further admitted his conduct was contrary to the Engineers and Geoscientists BC *Code of Ethics*.

Mr. Verma agreed to pay $1,500 towards the investigation costs of Engineers and Geoscientists BC. He is also prohibited from re-applying for reinstatement until November 14, 2022. If he does re-apply, he must proceed through the complete registration process as though he was never registered with Engineers and Geoscientists BC and meet the requirements of the Credentials Committee. Before applying for reinstatement of his registration, Mr. Verma must meet several requirements, including the completion of the Professional Practice Examination and the Professional Engineering and Geoscience in BC Online Seminar.

DISCIPLINE NOTICE: BRIAN MCCLURE, NANAIMO, BC

On May 9, 2022, Brian McClure agreed to a Consent Order cancelling his registration with Engineers and Geoscientists BC effective immediately. Mr. McClure is not permitted to practice engineering in BC or use the title "Engineer" or "Professional Engineer".

The discipline proceedings against Mr. McClure arose following an investigation into the structural engineering services he provided as the Engineer of Record for an 11-storey residential building originally known as Danbrook One in Langford, BC (the Building).

On December 10, 2021, following the completion of the investigation, Engineers and Geoscientists BC issued a Citation to Mr. McClure. Instead of proceeding to a disciplinary hearing, Mr. McClure admitted to the allegations in the Citation and agreed to the Consent Order.

In the Consent Order, Mr. McClure admitted he demonstrated unprofessional conduct contrary to the *Engineers and Geoscientists Act*. In particular, he admitted that the structural design drawings for the Building were deficient, and that aspects of the seismic design and gravity load resisting system did not comply with the 2012 British Columbia Building Code. Mr. McClure agreed that the existence of the significant defects identified in the structural design drawings demonstrated incompetence. Mr. McClure also admitted that, in relation to the Building, he failed to:

- undertake an adequate design process;
- review the design of another Registrant and identify major deficiencies;
- maintain complete documentation;
- ensure that an independent review of the structural design was completed and properly documented;
- perform and document a sufficient number of field reviews; and
- take adequate steps to address serious concerns about the structural design that were brought to his attention during construction.

Mr. McClure agreed to pay a fine in the amount of $25,000 (the maximum available under the prior *Engineers and Geoscientists Act*) and an additional $32,000 toward the legal costs of Engineers and Geoscientists BC.

Mr. McClure is prohibited from re-applying for registration with Engineers and Geoscientists BC for two years. Should he re-apply for reinstatement of his registration he must complete several requirements, including the Professional Practice Examination, the Professional Engineering and Geoscience in BC Online Seminar, and continuing education in structural engineering.

DISCIPLINE NOTICE: ROBERT JOHN MCLEOD, NORTH VANCOUVER, BC

On June 9, 2022, Robert John McLeod agreed to a Consent Order cancelling his registration with Engineers and Geoscientists BC. Mr. McLeod is not permitted to practice geoscience or use the title "Geoscientist" or "Professional Geoscientist" in BC.

On August 7, 2020, Mr. McLeod was selected by Engineers and Geoscientists BC to undergo a Practice Review and was asked to submit a completed Practice Review Questionnaire (the Questionnaire), as a required part of the practice review process. After he requested and received a deadline extension, Mr. McLeod failed to submit the Questionnaire and to respond to Engineers and Geoscientists BC's requests to complete the Questionnaire.

On January 28, 2022, Engineers and Geoscientists BC issued a Citation to Mr. McLeod, alleging that he breached the *Engineers and Geoscientists Act* by failing to provide the Audit and Practice Review Committee with the Questionnaire as part of the Practice Review process.

Instead of proceeding to a disciplinary hearing, Mr. McLeod admitted that he breached the *Engineers and Geoscientists Act* which required that a registrant, on request, provides the Practice Review Committee with any relevant information, record, or document.

In addition to the cancellation of his registration, Mr. McLeod agreed to pay $1,500 toward the legal costs of Engineers and Geoscientists BC. Before applying for reinstatement of his registration, Mr. McLeod must complete and pass the Professional Practice Examination, complete the Professional Engineering and Geoscience in BC Online Seminar, and undergo a practice review conducted by the Audit and Practice Review Committee.

IN MEMORIAM

Engineers and Geoscientists BC announces with regret the passing of the following registrants.

Anthony Cowley, P.Eng. (Non-Practising)
Carmelo De Seta, P.Eng.
Alexander William Dean, P.Eng. (Non-Practising)
Roy Andrew Dougans, P.Eng. (Non-Practising)
Charles Henry Gairns, P.Eng. (Retired)
David John Gardiner, P.Eng. (Non-Practising)
Hugh Mackay Hunt, P.Eng. (Non-Practising)
William George Mauch, P.Eng. (Retired)
Kirpal Singh Nirwan, P.Eng.
Armin Rader, P.Eng. (Retired)
Samuel Oliver Russell, P.Eng. (Non-Practising)
Peter Albrecht Schaerer, P.Eng. (Retired)
Xin Mei Shi, P.Eng.
Raymond Arnold Skytte, P.Eng. (Retired)
Brian Francis Talbot, P.Eng.
Eric Arthur West, P.Eng. (Non-Practising)

Correction

In the May-June 2022 edition of the *In Memoriam* section of *Innovation*, we incorrectly listed one registrant as "Retired". The registrant's designation should have read: Roy Milton Bartholomew, P.Eng., FEC. *Innovation* regrets the error.

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INNOVATION

CONTINUING EDUCATION: REQUIREMENTS

CONTINUING EDUCATION REQUIREMENTS

The Continuing Education Program is mandatory and applies to all registrants with practice rights. Registrants without practise rights (Non-Practicing or Retired) must complete minimum requirements to maintain ethical and regulatory competency. Engineers-in-training, geoscientists-in-training, and Life Members are exempt. The end of the first reporting year is June 30, 2022. By June 30 each year, the Ethical Learning and Regulatory Learning Modules and CE Plan must be completed and recorded in the online reporting system. More information, including our Guide to the Continuing Education Program, a CE Plan Template, a CE Plan Example, and a link to the Reporting System is provided at egbc.ca/Continuing-Education.

DESIGNATION	TOTAL HOURS REQUIRED	ETHICAL/REGULATORY	TECHNICAL, COMMUNICATIONS AND LEADERSHIP	CE PLAN
P.Eng., P.Geo, P.L.Eng., P.L.Geo.	60 CE Hours per 3-year rolling period	The Mandatory Regulatory Learning Module (once per reporting year) One CE Hour of ethical learning (once per reporting year)	Balance of Hours Requirement	Required
Non-practising, Retired	2 CE Hours per 3-year rolling period	The Mandatory Regulatory Learning Module and one CE Hour of Ethical Learning per 3-year rolling period	Optional	Optional
Struct.Eng.	120 per 3-year rolling period	The Mandatory Regulatory Learning Module (once per reporting year) One CE Hour of ethical learning (once per reporting year)	Balance of Hours Requirement	Required
EIT/GIT, Non-Practising Life Member	Optional	Optional	Optional	Optional

CONTINUING EDUCATION

SELF-PACED COURSES

EQUITY, DIVERSITY, AND INCLUSION FOR ENGINEERS AND GEOSCIENTISTS

Eligible for 1 CE Hour

This free, self-paced online course provides foundational training on equity, diversity, and inclusion to help individuals develop competencies in inclusive behaviours and emotional intelligence. ●

4 SEASONS OF RECONCILIATION—INDIGENOUS AWARENESS LEARNING

Eligible for 2.5 CE Hours

This self-paced online course promotes a renewed relationship between Indigenous Peoples and Canadians through transformative learning about truth and reconciliation. Learners will be provided foundational knowledge on the history and culture of Indigenous communities in Canada, the history of residential schools, and treaties around the country. ●

GEOLOGIZE PRACTICAL GEOCOMMUNICATION

Clear and appropriate communication of geoscience and engineering to the public is a key element of fulfilling professional ethical obligations. This self-paced, flexible course discusses the importance of communication in geoscience and is intended for registrants, trainees, and student members registered with Engineers and Geoscientists BC.

UPCOMING WEBINARS

TEAM BUILDING ON ENGINEERING AND CONSTRUCTION PROJECTS

August 13, 2022 | Eligible for 4 CE Hours

In this session, attendees will learn to improve how their teams work together by forging common goals and objectives, creating an environment of trust and teamwork, and fostering a cooperative bond to facilitate the successful completion of a construction or engineering project. ●

PROJECT CLAIMS AND DISPUTES ON ENGINEERING AND CONSTRUCTION PROJECTS

September 12, 2022 | Eligible for 4 CE Hours

This session discusses the causes and types of claims, the procedures by owners and contractors to avoid claims, and methods to quantify and resolve claims. ●

GEOTECHNICAL EARTHQUAKE ENGINEERING SHORT COURSE

September 19-21, 2022 | Eligible for 21 CE Hours

The course provides the participants with the fundamental concepts of geotechnical earthquake engineering and expands those to the key issues related to dynamic soil properties, local site effects and seismic site response analysis, soil liquefaction during earthquakes and the related assessments, seismic slope stability, basics of seismic soil-structure interaction, and seismic design of retaining structures. ○

PROJECT CONSTRUCTION MANAGEMENT

September 22, 2022 | Eligible for 7 CE Hours

This course will focus on the construction phase and its challenges with reference to major projects, cost overruns, safety, quality, and labour productivity. ○

TECHNICAL WRITING: SOLUTIONS FOR EFFECTIVE WRITTEN COMMUNICATION

September 26, 2022 | Eligible for 6.5 CE Hours

This seminar provides practical, applicable solutions and techniques for how to express your thoughts succinctly in written format. Through a series of hands-on workshops, you will learn to write effective emails, technical memos, letters, reports, and other documents. ●

UPDATE TO THE GUIDE TO THE LETTERS OF ASSURANCE

September 27, 2022 | Eligible for 1.5 CE Hours

This webinar is a joint presentation by the Architectural Institute of BC and Engineers and Geoscientists BC and supported by the Building and Safety Standards Branch. The presentation will provide a high-level overview of the Guide to the Letters of Assurance in the BC Building Code 2018 and Vancouver Building By-Law 2019, Version 6.1, which was posted in February of 2022. ○

CONTRACT ADMINISTRATION AND CONTRACTUAL ISSUES FOR ENGINEERING AND CONSTRUCTION PROJECTS

October 4, 2022 | Eligible for 7 CE Hours

This session will cover legal and contractual issues related to the effective management and administration of construction projects. It focuses on the roles and responsibilities of the owners, contractors, and engineers. ○

BUSINESS DEVELOPMENT AND SALES SKILLS FOR ENGINEERS AND GEOSCIENTISTS

October 4-December 30, 2022 | Eligible for 4.5 CE Hours

This program provides registrants with the skills and confidence to effectively address issues relating to sales and business development. Course topics include: presenting your firm's value proposition, discovering your client's requirements, conducting professional sales presentations, and securing commitment while selling. ●

SHOTCRETE: THE STATE-OF-THE-ART OF THIS VERSATILE CONSTRUCTION METHODOLOGY

October 5, 2022 | Eligible for 4 CE Hours

This workshop focuses intensively on skills practice to ensure participants build a higher level of resilience in dealing with stress. ○

FUNDAMENTALS OF PROJECT MANAGEMENT

October 18, 2022 | Eligible for 7 CE Hours

The purpose of this course is to introduce technical and non-technical individuals to those principles and techniques of effective project management, which can be usefully applied to technical and non-technical projects. ●

● **Regulatory Learning** ● **Ethical Learning** ○ **Technical Learning** ● **Communications/Leadership Learning**

We encourage you to take advantage of the new Knowledge Centre, at **egbc.ca/Knowledge-Centre**, *which provides on-demand educational opportunities. The Centre now hosts more than 100 on-demand recorded and self-directed courses on a variety of topics.*

For a complete listing of online learning opportunities, or for more information, visit *egbc.ca/Online-Offerings*, or contact us at 604.430.8035 or 1.888.430.8035.

CALL FOR PRESENTERS

Are you an expert in your field who would like to contribute to engineering and geoscience practice? Engineers and Geoscientists BC is actively seeking members to present on a variety of topics. For more information, please visit *egbc.ca/Practice-Resources/Professional-development*.

ENGINEERS & GEOSCIENTISTS BRITISH COLUMBIA

AM I COVERED?

Understanding Water Damage Coverage

Most standard home insurance policies provide coverage for sudden and accidental water damage caused by a **burst pipe or appliance*.**

You may need to take certain precautions during the usual heating season.

Overland water (flooding), sewer backup and service line coverage are typically not covered under a basic policy*. They can usually be purchased as an optional add-on to your policy.

Ask us about Enhanced Water Damage Coverage!

Overland water (flooding) coverage is not available for certain areas.

* Always consult your policy wordings to determine your specific coverage and exclusions

LET US HELP YOU PROTECT YOUR HOME, AUTO OR BUSINESS.

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