

A group of approximately 15-20 people, mostly young adults, are gathered in a forest. They are wearing safety vests (orange and yellow) and outdoor clothing like jackets and hats. Some are sitting on a large rock, while others are standing. The background is a dense forest of evergreen trees. The lighting is warm, suggesting late afternoon or early morning.

PDAC was surprised to recently learn about a student program named National Exploration Undercover School (NExUS) operating in Australia. It closely resembled S-IMEW, however neither program was known to the other. To learn more about S-IMEW—and to look for ways to possibly partner and collaborate—one of the NExUS founders, Dr. Richard Lilly from the University of Adelaide, South Australia, travelled to Canada to join the students on a four-day field trip to the Abitibi Greenstone Belt to explore the geology of Timmins and Rouyn-Noranda. At the final reception, Richard thanked the S-IMEW organizers and presented the co-chairs, Felix Lee and Karen Rees, with a ceremonial boomerang.

Thank you to all of the outstanding volunteers and sponsors who allow S-IMEW and its participants to succeed each and every year. Without this ongoing support and generosity, students would not have this exceptional opportunity. **c**

Kristy Kenny is PDAC's Manager, Communications.
Marc Gasparotto was PDAC's Coordinator, Student Program.

PDAC's Student-Industry Mineral Exploration Workshop (S-IMEW): An Australian Perspective

BY RICHARD LILLY,
NATIONAL EXPLORATION UNDERCOVER SCHOOL
(NEXUS), UNIVERSITY OF ADELAIDE

The Australian National Exploration Undercover School (NEXUS)

was established in 2016 by Graham Heinson and Richard Lilly of the University of Adelaide. The aim was to immerse and upskill 30 students and early career geoscientists from across Australia. Topics included current and emerging geophysical, geochemical and geological exploration techniques, the challenges facing the minerals industry, career advice and networking opportunities. Unknown to the NEXUS organizers, the Prospectors & Developers Association of Canada (PDAC) have been proactively addressing the same challenges since 2007 through the prestigious Student-Industry Mineral Exploration Workshop (S-IMEW).

After learning about the existence of each other's mutually-aligned courses, and a couple of good-natured Skype calls later, I found myself on a flight to Sudbury. I would join the students for the second week of their S-IMEW experience to provide a perspective for our NEXUS course and to learn from our Canadian counterparts. Student participants apply to take part in S-IMEW—a single student selected from each institution teaching geology (NEXUS selects two per institution)—with the aim to bring a cohort of highly-motivated future geoscience leaders together for an exceptional training and professional development experience.

The first week of S-IMEW covered professional and networking skills, geochemistry (including QAQC), geological reporting, geological mapping from both government survey and exploration approaches, a Sudbury Basin fieldtrip and a visit to Glencore's Ni smelter. The second week promised a fieldtrip through the Archean Abitibi Province with world-class field days at Rouyn-Noranda (Archean VMS), Timmins (Greenstone Au), Pyke Hill (komatiites), industry meet-and-greet and career advice sessions, a 'diamond-day,' as well as an underground visit to a producing Au mine and Au processing facilities. A packed schedule!

I was met in a sunny Sudbury by S-IMEW Student Coordinator Marc Gasparotto and immediately joined the group in their fleet of mini-buses to travel the 350 km north to Rouyn-Noranda, Quebec. One thing Australia and Canada certainly have in common is scale! On route a stop was made to observe 2.79Ga banded iron formations (BIF) of the Archean Abitibi Basin. Being used to Australia's often ancient and deeply weathered exposures, seeing polished fresh rocks of such great age was staggering. I am not sure the Canadian students can appreciate how fortunate they are to have such well-presented outcrops!

The theme of being staggered by what I was seeing continued in the field for the next couple of days with a full-day fieldtrip around the classic Noranda-camp VMS deposits (led by Gérald Riverin) to view

mineralized exposures, brecciation and alteration. This was followed by a textbook volcano-stratigraphic logging exercise within sight of Glencore's Noranda operation. I also felt I was getting a true taste of Canada by crossing a beaver dam to get to outcrops and tasting my first double-double and poutine (but not at the same time).

As soon as we were in the field it was clear that the S-IMEW selection process is working well, with keen cheerful students having to be prised off each outcrop to return to the buses. A neat bonus for the students is that they each get their own 'rock-box'—a large cardboard filing box that gets delivered by PDAC to the students' home to encourage sample collecting. Some of these boxes were seriously weighty by the end of the week!

Evenings were also packed, with time for a quick change before evening activities and post-dinner talks from industry representatives. Evening sessions covered a range of topics including career paths, ore deposit models and successful exploration case studies.

After two days in Quebec the fieldtrip moved locations to Timmins, Ontario stopping at Pyke Hill to view the world-class komatiite flows and also visit the Potter Mine Cu-Zn-Pb deposit.



Timmins reminded me very much of Mount Isa in Queensland, a proud mining community with a history inseparable from the minerals industry. The first day in Timmins featured a geology tour of the area, including historical outcrops and mine visits to Goldcorp's Porcupine Dome and Hollinger open pits. Tahoe Canada hosted an excellent meet-and-greet evening where the students could meet senior staff from all facets of the Timmins operations and get a perspective on the range of geoscience-related careers that exist. The students were also treated to comprehensive tours of Tahoe Canada Timmins West and Bell Creek underground mines and their Bell Creek Au processing mill. I have never been on a tour that has had such open access to operations at this scale. The pace of the fieldtrip was unrelenting and after a day spent underground at a mine and visiting processing facilities the group re-boarded the mini-buses to return 300 km back to Sudbury.

The energy and positivity displayed by the students in the field was impressive. It was also extremely pleasing to see the students looking out for each other in the field; a sure sign that a strong group dynamic has been built. Hopefully these friendships will continue into the cohort's professional networks during their careers; an aim very much shared by NExUS.

The final day of S-IMEW was hosted by senior geologists from De Beers Canada and included a great series of lectures on kimberlite geology and diamond exploration.

We were also allowed privileged access to diamond exploration drill core and spent a few fascinating hours viewing complex breccia textures. The level of technical expertise the students were exposed to on this and every other day was remarkable. To top the diamond-day off we were then taken to the (not-so) secret diamond cutting facility in downtown Sudbury where we were allowed to get up close to hundreds of Canadian diamonds, including raw stones in the process of being cut and faceted. With exposure to so much information and new experiences I suspect some of the learning outcomes from the workshop will take some time to settle in, and for the students to reflect on the fantastic opportunity that S-IMEW represents to their careers.

The workshop concluded with a farewell meal, where contributing industry geoscientists, academics, previous S-IMEW alumni and their guests mingled and discussed the previous two weeks. Speeches were made and the whole experience was wrapped up by the organizers. I was able to present S-IMEW Chairman Felix Lee with an Australian boomerang painted with traditional Aboriginal designs—a symbol of a relationship between S-IMEW and NExUS that will hopefully keep returning. To provide a Canadian perspective for NExUS 2017 we plan to involve a S-IMEW alumnus as a demonstrator during the course. Hopefully further cross-pollination initiatives can take place in future years to continue to exchange ideas and approaches in exploration between Australian and Canadian geoscientists.

Reflecting on an extremely memorable week I was struck by the profound similarities of the exploration and mining histories of Canada and Australia, including the scale of both countries and the late-nineteenth century timing and serendipity of many of the mineral discoveries. The logistical and climatic challenges of development and sustaining remote mining camps (in the face of the near opposite climatic extremes between Australia and Canada) and the pride inherent in the mining communities we visited (and their mutual love of big trucks and beer!).

The current and future challenges facing the exploration industry are also highly comparable between the two countries as we explore ever more remote areas and under cover. Surely one of the best ways to address the challenges of the future is to upskill the next generation of explorers and to assist in providing a network for them to learn from. Hopefully the motivated future leaders of S-IMEW will help address the challenge in Canada as it is hoped the NExUS alumni will in Australia.

My thanks go to Felix Lee, Karen Rees and Marc Gasparotto for the invitation to attend and for the S-IMEW cohort for making me feel so welcome during the fieldtrip. I am hopeful to be able to join the next S-IMEW group in 2018 to continue the positive connection between our two exploration training initiatives. **c**

The S-IMEW Questionnaire



Matthew DeGasperis
Western University (UWO)

WHAT WAS YOUR FAVOURITE S-IMEW MOMENT?

M Meeting and getting to know my fellow students was definitely a highlight. Picking a specific moment is difficult but if I were to choose it would be at the Glencore drill site. I learned some important drilling techniques (e.g. ins and outs of wedging) that have given me more insight for operations support in my role as a project geologist. It was also a great spot for talking with students about their experiences. Overall, good job Glencore!

WHAT WAS YOUR FAVOURITE DAY?

M See above. Glencore day was great. However, there were many other amazing days, mainly while out in the field, like government mapping day, exploration mapping with Wallbridge, as well as the days spent in Noranda and Timmins.

WHAT EFFECTS DO YOU THINK S-IMEW WILL HAVE ON YOUR CAREER?

M I strongly believe S-IMEW will have a positive effect on my career. Not only have I made strong connections with some top industry personnel, I have made strong connections with my generation's geologists around the country. The latter alone could bring amazing job and entrepreneurial opportunities going forward. Also, the prestige of being a S-IMEW alumni and having it on my resume could instantly translate into a career. Other benefits include being exposed to industry regulations, technologies and processes.

WAS THERE A SPEAKER THAT INSPIRED YOU THE MOST?

M I would say the keynote speaker Keith Barron was most inspirational to me. His story of perseverance through tough times in the industry and/or in his career eventually leading to his discovery of the Fruta del Norte world-class deposit in Ecuador was amazing and truly inspirational. What an amazing speaker and storyteller.

HOW DID THE PRESENCE OF S-IMEW ALUMNI SPEAKERS AFFECT YOUR EXPERIENCE?

M Learning what S-IMEW did for fellow alumni was eye opening and a really nice change-up in the daily talks. It made the evening more relaxing after a long day. The talks were a lot easier to follow at that time of the day/evening. Learning where these alumni are at in their careers within just a few years after their S-IMEW experience was also very motivational. Overall this was a really great part of the program and they should try to bring in more speakers for the evening talks.

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WHAT LESSON DID YOU TAKE AWAY FROM YOUR EXPERIENCE UNDERGROUND?

M Safety is definitely a priority. This is true anywhere but underground there are so many more concerns to look out for and be aware of.

WHAT LESSON DID YOU TAKE AWAY FROM YOUR EXPERIENCE IN THE FIELD?

M Same as above. Also some techniques used for mapping and drilling processes.

WOULD YOU LIKE TO SAY ANYTHING TO THE SPONSORS?

M Thank you to all the sponsors for making S-IMEW possible. Your sponsorship of this program is very important for the development of the many new generations of geoscientists for the mining and exploration industry. Not only have we made strong, long-lasting connections and friendships, we have gained valuable practical knowledge and experience. Programs like S-IMEW are what make our industry great and will continue to do so with your help.



Kassandra Sofonio
McGill University

WHAT WAS YOUR FAVOURITE S-IMEW MOMENT?

K My favourite moment was when we visited the Glencore Smelter and saw them pour the molten metal into large crucibles. I had never seen anything similar and it really impressed me.

WHAT WAS YOUR FAVOURITE DAY?

K My favourite day was the Pyke Hill day of the Noranda Field Trip. Seeing the komatiites and having a tour of the geology in that area was one of the highlights of the trip for me. In addition, our guide made the visit extremely dynamic and poignant.

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WHAT EFFECTS DO YOU THINK S-IMEW WILL HAVE ON YOUR CAREER?

K I think S-IMEW has given me a bit of an advantage over the other students that didn't get the chance to participate in the workshop. The connections I made, the experiences I gained, and the speakers I met all helped give me insight into having a successful career. I developed tools at the workshop that I am sure will help me with my career in the future.

WAS THERE A SPEAKER THAT INSPIRED YOU THE MOST?

K There are many speakers that inspired me, but if I had to choose one I would say Patrick McAndless stands out the most. He gave an incredible speech and he really tries to help the students with their careers. Even when the workshop ended we kept in contact and he has helped me with various things, such as how I should present myself to a potential employer.

HOW DID THE PRESENCE OF S-IMEW ALUMNI SPEAKERS AFFECT YOUR EXPERIENCE?

K The speakers really opened my eyes to a lot of topics I knew nothing about. In school we learn a lot of geological theory, but we don't really learn about the industry. The speakers provided a lot of insight and advice about having a geological career.

WHAT LESSON DID YOU TAKE AWAY FROM YOUR EXPERIENCE UNDERGROUND?

K Considering how our underground experience was terminated prematurely due to a power outage, the main takeaway is that going underground can be unpredictable. There are dangers, as well as unforeseen circumstances, so vigilance is required while working underground.

WHAT LESSON DID YOU TAKE AWAY FROM YOUR EXPERIENCE IN THE FIELD?

K I learned a lot of techniques in the field that I hadn't learnt during my field schools. Essentially, it made me realize that there are a lot of different methods to conduct exploration, and that these methods ameliorate with time as technology advances.

WOULD YOU LIKE TO SAY ANYTHING TO THE SPONSORS?

K I would just like to immensely thank the sponsors. S-IMEW has been one of the most enriching experiences of my geological career to date. I am often reminiscent about the workshop and all the wonderful memories I got thanks to it. **c**

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