APGO
ASSOCIATION OF PROFESSIONAL GEOSCIENTISTS OF ONTARIO

Building Strong Connections

JOIN US!

November 5, 2014

APGO's North East Regional Networking Event

Hosted by Ben Berger, P.Geo.

Guest Speaker: Dr. John Ayer, PhD, P.Geo.

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Venue: United Steelworkers Conference Centre
Second Hall
66 Brady Street
Sudbury, Ontario

Event will start at 4:30 p.m.

REGISTRATION

Attendees:	$15
Geoscience Students:	Free

Visit www.apgo.net to register online.

Hors d'oeuvres will be served. Cash bar.

The Association of Professional Geoscientists of Ontario (APGO) invites you to join us in Sudbury on November 5, 2014. Hosted by APGO's North East Regional Councillor, Ben Berger, P.Geo., this networking event aims to bring together professional geoscientists, geoscientists-in-training, geoscience students, the academia, and other industry stakeholders in the region.

Don't miss this excellent opportunity to make new connections and re-establish old ones. Register early!

GUEST SPEAKER

Dr. John Ayer, PhD, P.Geo., Associate Director of Mineral Exploration Research Centre (MERC) will be the guest speaker at the event. He will be talking about ***Timing and Controls on Gold Mineralization in the Abitibi Subprovince***. He will also be providing an update on the work of MERC.

Contact information: Marilen Miguel, 416 203 2746 ext 24, mmiguel@apgo.net

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About Dr. John Ayer, PhD, P.Geo.

Dr. John Ayer currently serves as the Associate Director of MERC, an exploration geoscience research centre at Laurentian University focusing on Precambrian ore systems research, education, exploration methodology and targeting. He is also a consultant whose work includes a 1-year project to study gold mineralization in the Southern Abitibi for the Discover Abitibi Initiative in 2011-12. Prior to this, Dr. Ayer was with Ontario Geological Survey for 28 years. His work included leading the Precambrian Section Mapping Program in NE Ontario. He was the OGS' lead representative on the Discover Abitibi Initiative and Coordinator for the TGI-3 Abitibi Project in collaboration with the Geological Survey of Canada and Geology Quebec.

In the early years of his career, Dr. Ayer worked as a project geologist for various mining companies across Canada. Specializing in Precambrian Geology, Dr. Ayer completed his MSc at Carleton University in 1979 and earned his PhD at Ottawa University in 1999.

Dr. Ayer authored and co-authored a number of published geological papers over the course of his career. He was also co-editor of a 2008 Economic Geology Special Issue devoted to base metal and gold metallogeny in the Abitibi Greenstone Belt. In May 2014, Dr. Ayer was one of the recipients of CIM's Barlow Medal Award for Best Geological Paper in recognition of his contribution to the 2012 paper ***"Structure, Stratigraphy, U-Pb Geochronology and Alteration Characteristics of Gold Mineralization at the Detour Lake Gold Deposit, Ontario, Canada"***. The paper was published in Exploration and Mining Geology, Volume 20.

ABSTRACT

Timing and Controls on Gold Mineralization in the Abitibi Subprovince
John Ayer, PhD, P.Geo.; Associate Director, MERC

Much of the Abitibi's gold production is from deposits controlled by late regional faulting with associated sedimentary units. The faults, successor basins and gold deposits young southward across the Abitibi. In the north, the late tectonic assemblages consist of 2700 Ma turbiditic sedimentary rocks, unconformably overlain by 2692 Ma alluvial-fluvial sedimentary and alkalic volcanic rocks. In the northeast Abitibi, gold mineralization associated with D1 deformation is tightly constrained at 2697 ± 1 Ma by the ages of mineralized and post-ore porphyry dikes. At the Detour Mine in the northwest, D1 resulted in 2725 Ma volcanic rocks thrust southerly over 2700 Ma turbidites along the Sunday Lake deformation zone. Subsequent oblique-slip deformation overprinted D1 with both dextral and sinistral components of displacement. Gold occurs in narrow high grade zones next to flexures along the faulted contact between the sedimentary and volcanic rocks, and as broad, lower grade, stockwork-disseminated zones in mafic flows in the hanging wall. The age of a barren albitite dike cutting mineralization indicates that gold occurred ca. 2697 Ma.

The timing of gold mineralization and D1 thrusting is younger in the southern Abitibi. Gold occurs in the hanging wall and in intrusions along the Pipestone deformation zone, a south-verging thrust north of Timmins. Here, 2720-10 Ma volcanic rocks were thrust over 2690-80 Ma turbidites, providing a maximum age of 2680 Ma for gold mineralization. Further south, prolific gold mineralization is associated with the Porcupine-Destor and Larder Lake-Cadillac deformation zones where younger, north-verging D1 thrusting is associated with 2676-70 Ma alluvial-fluvial sedimentary and alkalic volcanic rocks. Oblique-slip deformation overprinted the D1 thrusting with sinistral followed by dextral displacement with gold mineralization occurring at ca. 2665-60 Ma. Further to the south in the Shining Tree area, an even younger gold event occurs within a breccia pipe where molybdenite associated with the gold mineralization has a Re-Os age of 2630 ± 10 Ma.

Controls on southward younging of tectonic events and gold mineralization are best explained by successive episodes of accretion of terranes late in the Abitibi's evolution, beginning by collision with the Opatica Subprovince in the north and culminating in collision with the Minnesota River Valley terrane to the south. Southward younging accretionary-related fault structures are thus considered as the pathways for fluids bringing gold to the presently exposed crustal level.

A significant amount of production also comes from gold with base metals in older hydrothermal systems such as gold-rich VMS deposits which range from 2736 to 2698 Ma and in high level porphyry intrusions. For example, Re-Os geochronology yielded an age of 2737±7 Ma on molybdenite associated with gold and chalcopyrite within a 2740±1 Ma tonalite-diorite complex at the Côté Gold deposit.

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