

The Rock Record – May 2004

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Newsletter

The SGS Newsletter is produced by the SGS executive. Letters, announcements, notices, comments, photos, news and information about SGS members, etc. are always welcome. Call an executive member or write to us at:

**Saskatchewan
Geological Society
P.O. Box 234
Regina, SK S4P 2Z6**

SGS e-mail address:
saskgeologicalsociety@
hotmail.com

All advertising inquiries should be directed to **Andre Costa**

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Thursday, May 20, 2004

Annual SGS Public Lecture!

**The Rocky Planets: a geological field trip through the
inner Solar System**

Simon Hamner

Geological Survey of Canada

Royal Saskatchewan Museum

7:30 pm

Refreshments provided

No Charge

Thursday, May 27th, 2004

Innovation and Integration

The Northern Lights Oil Sands Project

Errin Kimball

Synenco Energy Inc.

Lancaster Room, Royal Canadian Legion

Cash Bar: 11:30; Lunch: 11:50

Meeting: 12:15 – 13:00

Members \$7.00, Non-members \$11.00

Contact: Andre Costa 787-9104

By NOON, Monday, May 24, 2004

Simon Hanmer

The Rocky Planets: a geological field trip through the inner Solar System

Mercury, Venus, Earth's Moon and, especially with all the recent media attention, Mars! What do you think of when you look up at these 4.6 billion year old members of the inner Solar System? Some see the planets as bright, star-like objects, while others see a face or a rabbit in the full Moon. Thanks to telescopes, cameras carried by satellites, and people walking (and playing golf) on the Moon, planetary geologists are now beginning to understand that these bodies are made of rocks, as is our own planet Earth, and refer to them as the "*Rocky Planets*". However, no two of the rocky planets are alike, despite some superficial similarities, and none of the others resembles the Earth or shares its dynamic geological history.

Thanks to the wonderful images made publicly available by NASA¹, JPL², Malin Space Science³ and others, it is possible for anyone to examine the surface features of the other rocky planets, to deduce the processes that formed them, and to unravel their geological histories. The results are fascinating. The outer layers of Venus, often referred to as Earth's twin, probably melted across the entire planet about 1.0 billion years ago, erasing most traces of its older history. The surface of Mars bears the largest volcanoes and the largest valleys in the Solar System, much larger than equivalent features on Earth. Mercury looks like a textbook rocky planet should on the outside, but it has an unexplained anomalously large dense core on the inside. Our own Moon has its own peculiarities, and is close enough that we can observe them for ourselves, even with small amateur telescopes.

In this talk, we'll take a geological field trip to our rocky neighbours in the inner Solar System and look at them through the eyes of planetary geologists⁴. What do they see, how do they interpret what they observe, and how confident are they in their models? Can they offer robust geological explanations for our rocky neighbours?; not always, but they are doing very well. Do we need to send manned missions to resolve the many remaining problems?; come on the field trip to the inner Solar System, then decide for yourselves

Errin Kimball

Innovation and Integration

The Northern Lights Oil Sands Project

The Northern Lights Project is on track to be a fully integrated surface mineable oil sands operation. Located in the Athabasca Oil Sands Area, 110 kilometers north of Fort McMurray, the Project is designed to produce more than 100,000 barrels per day of synthetic crude over a 30-year life, with first production planned for 2008. Synenco Energy Inc, a private company incorporated in 1999, holds Oil Sands Permits 02, 05, 80, and 81, which comprise the Northern Lights Project in Townships 98 and 99, Ranges 5 to 7 west of the Fourth Meridian.

The integration of efforts by a diverse team of specialists in geology as well as geophysical, geotechnical, mine, environmental and process engineering, has resulted in innovative approaches to the geological modeling and plans for economic and environmentally sound exploitation of this large bitumen resource, estimated at over 1.3 billion barrels (measured and indicated).

The mineable oil sand resources are hosted in the Lower Cretaceous (Aptian) McMurray Formation of the Mannville Group. The McMurray Formation was deposited within an eroded Devonian landscape, infilling valleys and eventually completely covering the older strata in this area. Later, Quaternary sedimentation removed some of the McMurray in this Project area. The resulting proximity of the oil sands to the surface makes them amenable to exploitation by mining methods.

In many Athabasca Oil Sands project areas, the McMurray Formation is informally subdivided into a lower fluvial member, a middle estuarine member and an upper marginal marine member. In the Northern Lights Project area, the majority of the bitumen is contained within the lower fluvial member, which was deposited by fluvial systems that drained the nearby Precambrian Athabasca quartzite. As a result, most of the bitumen at the Northern Lights Project is contained within relatively clean, medium- to coarse-grained quartz sand. Compared to deposits in the estuarine and marine members, the pore water is relatively fresh, and the amount of "fine" ($-44\mu\text{m}$) clay material is significantly lower. This 'low-fines' situation presents an opportunity to apply innovative mining, ore handling and pre-processing methods, because the relative absence of 'fine' material means that traditional approaches to primary ore processing are not necessary.

The challenge of delineating and modeling of the fluvial channel trends has called for detailed observation and interpretation of sedimentary structures and palynological data. The application of fundamental sedimentology combined with interpreted structural controls is guiding the exploration strategy for the Northern Lights Project. The integration of core interpretation, core analyses and down-hole geophysics has proven to be an effective tool for interpreting the channel trends.

The Northern Lights Project permit areas were previously relatively unexplored. Synenco initiated drill programs of ever-increasing size and scope, which has resulted in a 3D geological model being developed using a very large database of core, borehole geophysical logs and core analyses data. Assessment and modeling of data from over 425 drill holes within the project area has resulted in the delineation of a measured and indicated resource of approximately 1.3 billion barrels of surface mineable bitumen. Over 150 additional drill holes are currently being assessed and integrated into the geological model.

The mine's footprint will be small due to the use of continuous mining technology, consisting of hydraulic excavators, in-pit conveying equipment and mobile crushers. The mine permit application and associated environmental impact assessments are planned for filing in the fourth quarter of 2004.

S.G.S Annual Potash Mine Tour

17 SGS members and SIR employees took part in this year's potash trip to the Estarhazy K-1 mine. After a long drive on icy roads, in the early morning, the tour was enjoyed by all in attendance.

IMC staff were incredibly hospitable, treating us to a fantastic lunch and presentation after the tour was over.

Renew Your Memberships!

Time is quickly running out, for those unpaid to remain on our mailing list. Don't hesitate any longer!

In Memoriam: Bill Johnston

We bid farewell to a long-time SGS member and Saskatchewan Geological Survey employee, Bill Johnston.

Following is the obituary from the Regina Leader Post:

JOHNSTON_WILLIAM GEORGE 1922-2004 The family wishes to announce the sudden and tragic death of their husband, father and grandfather, Bill, on Friday May 14, 2004. He is survived by his beloved wife, Margaret Ruth; son Rex and his fiancé.

A further review of Bill's life and career will be published in a future Rock Record edition.

SGS Golf Tournament!

Book your team now for the ever-popular SGS golf tournament. The tournament will take place on Friday, September 10th, with a barbeque to follow at Dave MacDougall's house.

Phone Bob Troyer at 787-2562 to book your spot, or for more information.

SGS Annual Summer Field Trip to Montana, August 20-24, 2004.

This year we will visit the Little Rocky Mountains and Bears Paw Mountains of North-Central Montana. The field trip will leave Regina on Friday, August 20th (AM) and return on Tuesday August 24.

Drs. Don Kent (U of R) and Ben Rostron (U of A) will co-lead the trip. We will look at everything from Paleozoic and lower Cretaceous sediments, to Tertiary volcanics and intrusives. We may even see the mummified remains of a hadrosaur in Havre.

Please call John Lake (787-2621) to book a space. Costs are \$250 per person which includes transportation, lodging, field lunches, and a field guidebook.

Book early to avoid disappointment!