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Natural Resources

Atlantic Geoscience Society Awards Gesner Medal to DNR Geologist Chris White

The Atlantic Geoscience Society (AGS) held its annual General Meeting and Colloquium in Dartmouth from February 1 to 3. The annual AGS meeting is an exciting venue for the geoscientists of the Atlantic Provinces to gather, discuss current research and future trends in research and development, and listen to the work of the region's student geoscientists. This year's meeting featured an award of the society's highest honour, the Gesner Medal, to DNR geologist Chris White.

As senior geologist for bedrock mapping with DNR Chris has directed and personally completed the mapping of an immense area of Nova Scotia since joining the department in 1997. He has redefined the stratigraphy of the Meguma terrane (see p. 3) and has added enormously to our understanding of the Antigonish Highlands, Guysborough County and Cape Breton Island. Chris's influence in mapping Nova



Chris White (centre) and Garth Prime (left) examine rocks in the Antigonish Highlands area. It's no joke that geologists can often be found in a ditch.

Scotia is literally on par with Fletcher and Faribault. The chief beneficiaries of all this work have been the people of Nova Scotia, and the resource companies, planners and other geologists who have used his work. In addition to having mapped somewhere between 30% and 40% of Nova Scotia, Chris has published about 50 papers in the geological literature and has collaborated with authors throughout the Appalachians, in the UK, Spain and Germany.

Despite Chris's prodigious output, he is not motivated by the spotlight. Chris has strongly promoted the work of geoscience students at Atlantic universities and has employed many of them for summer work on projects that became their own thesis research. His legacy as a student mentor alone is probably sufficient for his nomination to receive the Gesner Medal. But his service to the Atlantic Geoscience Society itself is what tips the balance. Chris has served as business manager for the society's journal *Atlantic Geology*, as driver behind the most recent edition of the *Geological Highway Map of Nova Scotia*, as Technical Program Chair for the Halifax GAC-MAC conference, and as co-leader of numerous field trips throughout the region. All these commitments are carried over and above the day-to-day demands of Chris's work for the Nova Scotia Department of Natural Resources.

Chris has made a phenomenal contribution to the geological mapping of the Maritime Provinces and has provided a tremendous input to our understanding of the geology of this region. He has also maintained a remarkable level of activity behind the scenes in the promotion of earth science and of the Atlantic region. The Atlantic Geoscience Society is very pleased to award the 2013 Gesner Medal to Chris White.

*Rob Raeside, Acadia University
Secretary, AGS*

Coastal Geologist Chantel Nixon to Join Mineral Resources Branch in March

I am very pleased to announce that Chantel Nixon has joined the Geological Services Division at DNR as our new Coastal Geologist. Chantel successfully competed for the Coastal Geologist position in the Environmental Geology Section and will assume her new role on March 18.

Chantel received her B.Sc. (Honours) in 1999 and an M.Sc. in 2002 from the School of Geography and Earth Sciences at McMaster University, and her Ph.D. from the Department of Earth and Atmospheric Sciences at the University of Alberta in 2012. Her Ph.D. thesis was titled "Expanded multiple ice sheet margins and new relative sea-level data in the western Canadian High Arctic." Her research interests include sea-level

change, coastal and glacial geomorphology, Quaternary geology, micropaleontology, marine geology and local/traditional knowledge. She has spent a number of field seasons working in the Arctic and has spent several semesters as an instructor in the Environmental Technology Program at Nunavut College in Iqaluit, Nunavut. Over the last year she has been working as a geological consultant with the Geological Survey of Canada (Atlantic Division) in collaboration with Steve Blasco.

I am very pleased to welcome Chantel and believe that her skills will be a great addition to our coastal geology program.

Brian Fisher

Registry Modernization Project Nears Testing Phase

Work continues on the department's project to modernize the Registry of Mineral and Petroleum Titles. While the system developer is configuring the necessary components, Registry staff members have been working with project specialists to develop a robust testing plan for the new system. This will ensure that all problems are identified and corrected before the system is commissioned. Work also continues with migration of the necessary analogue records into the system; testing will be carried out to ensure that this effort was successful as well. A mail-out campaign to reach prospectors and mineral-rights holders in Nova Scotia was successful in updating records and obtaining valid contact information.

Registrar of Mineral and Petroleum Titles John MacNeil made

presentations to the Prospectors Association of Nova Scotia and the Mining Association of Nova Scotia. These presentations described the changes that will be occurring, the benefits to users, training resources for using the system, and a schedule for implementation in the second quarter of 2013. The presentations provided the opportunity for excellent discussions with stakeholders about the system, which will be known as **NovaROC**. The department will amend the regulations of the *Mineral Resources Act* in order to accommodate such innovations as online staking and submission of assessment reports (see p. 6). Further information will be provided in the next issue of this newsletter as we move closer to implementing the new system.

Sandy Nickerson and John MacNeil

Looking Back at Geology Matters 2012 - Online!

The Mineral Resources Branch of the Nova Scotia Department of Natural Resources (DNR) hosted its 36th annual fall conference on October 29 and 30, 2012. The morning session on October 29 featured presentations under the theme *New Initiatives*. DNR staff gave presentations on the Mineral and Petroleum Registry Modernization Project, the 2012 Nova Scotia Mineral Incentive Program, as well as exciting results from mapping projects and deposit studies throughout the province. The modernized Registry of Mineral and Petroleum Titles will provide many benefits to stakeholders, including global access to a secure, map-based system for acquiring mineral and petroleum rights in Nova Scotia. The 2012 Nova Scotia Mineral Incentive program was fully subscribed, and assisted many prospectors and exploration companies in the search for new discoveries and to advance projects toward production.

A highlight of Geology Matters 2012 was the department's unveiling of the new bedrock geology maps of southwestern Nova Scotia (Fig. 1). DNR geologist Chris White worked for ten years to map the area and compile the best mapping of other workers. The 25 map sheets, at a scale of 1:50 000, were combined on a huge 8' x 14' panel that showed the latest interpretation of the rocks of southwest Nova Scotia. These new maps reveal information about the area's economic potential, its geological history, and its environmental hazards and opportunities.

During the afternoon technical session, under the theme *Exploration and Mining*, guest speakers presented details on Capital Pool companies, the Canadian Environmental Assessment Act 2012, and exploration activities and industry trends. The afternoon program also included an *Exploration and Mining 101 Workshop* for those interested in learning about exploration and mining activities and the associated regulations.

Lunch on October 29 featured speaker Brent Mullins of Scotia Asset Management Group. Mr. Mullins gave

an informative report on *Trends in Global Financial Markets*. A workshop was held in the afternoon to explain the many aspects of the geoscience profession to local university students. Premier Darrell Dexter attended the conference and heard about some of the exciting activities and challenges facing the mineral industry.

The first day of Geology Matters 2012 ended with the Minister's Reception and Awards Ceremony. The Honourable Charlie Parker delivered a message highlighting the importance of the industry to the economy of Nova Scotia. Mr. Parker assisted in the presentation of the Terrance Coughlan Memorial Award to Kim Conrad, President of Conrad Brothers Limited, for his contribution to the development of industrial minerals in Nova Scotia. Mr. Parker presented the Prospector of the Year Award to Ralph Stea.

A *Community Engagement Workshop* filled the morning session of October 29. Facilitator Fred Bonner of TBL Resource Solutions Inc. led a discussion of the questions: Who are the communities?, Why engage communities? and How to engage communities. Guest speakers described their experiences using the tools that companies need for successful engagement and to earn a social licence to operate. The *Community Engagement Workshop* was followed by a luncheon with guest speaker Don Bubar, President of Avalon Rare Metals Inc. Mr. Bubar presented Avalon's perspective on corporate social responsibility, and how Avalon has successfully applied E3 Plus principles in the Northwest Territories. E3 Plus is a framework developed by the Prospectors and Developers Association of Canada for responsible exploration.

The *Exploration and Mining* session on the second day of the conference included company updates from industry representatives, a discussion of how Nova Scotia can add value to its gypsum resources, and the

viewpoints and activities of the Mining Association of Nova Scotia and the Mining Society of Nova Scotia.

Content from Geology Matters 2012 has been posted on the branch website at <http://www.gov.ns.ca/natr/meb/oh/index.asp>. Powerpoint presentations, including both the slides presented and a recording of the oral presentation, videos and posters are now available on the branch website.

Diane Webber



Figure 1. Chris White points out an area of interest in southwestern Nova Scotia to George O'Reilly at Geology Matters 2012. New mapping by Chris and his co-workers, combined with a digital compilation of the work of previous mappers, has re-defined subdivisions of the Precambrian to Mesozoic rocks from Halifax to Yarmouth to Cape Split. Releasing the final maps in October 2012 represented the culmination of more than ten years of work in the field, as well as a massive job to collect and compile digital data.

'One Window' Standing Committee for Mineral Development in Nova Scotia Meets with Seven Proponents in 2012

To clearly and effectively communicate the province's laws, policies and regulations in support of mineral development, the Government of Nova Scotia provides a 'One Window' process for the proponents of mineral development projects. Under this process all provincial and federal government departments that play a direct role in regulating, reviewing, licencing, leasing and monitoring mineral development activity in the province act together to streamline government oversight. The One Window Standing Committee (pictured at right) meets once a month to review mineral development activity in the province.

Typically, the government departments involved are the Nova Scotia Department of Natural Resources (Mineral Development and Policy Section and Land Services Section), Nova Scotia Environment (Environmental Monitoring and Compliance and Environmental Assessment), Nova Scotia Department of Labour and Advanced Education and the Nova Scotia Office of Aboriginal Affairs. Representing the federal government are Environment Canada and the Canadian Environmental Assessment Agency.

In 2012 the proponents of seven mineral development projects (one mineral sand, two coal and four gold projects) requested One Window meetings with government. These meetings are designed to provide proponents with a means to communicate with representatives of many different government departments in one sitting.

All of the proponents expressed appreciation for having access to such a process and encouraged government to continue with it because it is an effective means of communicating the province's laws and policies that support the sustainable development of mineral resources.

Patrick Whiteway, Chair of the 'One Window' Standing Committee



Celebrating the end of a busy 2012 are the members of the 'One Window' Standing Committee. Back row (l to r): Bernard Matlock, Nova Scotia Environment; Pleman Woodland, Labour and Advanced Education; Patrick Whiteway (committee chair) and Alan Davidson, Department of Natural Resources. Front row (l to r): Steve Sanford, Nova Scotia Environment; Tom Lamb, Department of Natural Resources; Micheline Savard, Canadian Environmental Assessment Agency; and M.T. Grant, Environment Canada.



Staff of the Mineral Resources Branch toured the Pioneer Coal Mine in Stellarton in November 2012. Coal reserves are sufficient for mining to continue until 2016, after which the site will be fully reclaimed.

From the Mineral Inventory Files

The Cowan Mill Pond Tungsten Occurrences

The late 1970s to early 1980s saw a period of intense mineral exploration for deposits of tin (Sn) and related elements in the granites of southern Nova Scotia. Most of this search focused on the mammoth South Mountain Batholith because that's where the early discoveries were made and that's where the most interesting deposit, the East Kemptville Sn-W-Cu-Ag deposit, was found (see *Nova Scotia Minerals Update*, v. 29, no. 4). With time, however, the explorationists slowly wended their way east and started to explore the granite plutons of the Eastern Shore. The Musquodoboit Batholith (Fig. 1), Nova Scotia's second largest granitic batholith, soon started to have its turn and very quickly interesting things started to turn up.

In 1983 Billiton made a discovery of endo- and exo-contact greisen and greisen-bordered quartz veins containing impressive amounts of wolframite and scheelite, and lesser amounts of molybdenite, chalcopyrite, sphalerite and galena in the area of Cowan Mill Pond just east of Lake Charlotte (Fig. 1). The veins and greisens were associated with small intrusions of quartz-feldspar, cordierite porphyry and fine- to medium-grained, muscovite-biotite leucomonzogranite. These interesting, volatile-rich, late stage intrusions were emplaced at, or very near, the contact of the coarse-grained biotite monzogranite that constitutes much of the Musquodoboit Batholith with the enclosing Cambro-Ordovician metasediments of the Meguma Group. Billiton mapped the area and drilled six holes in 1983, and Falconbridge drilled another four holes in 1987. Fairly good results were obtained in both projects. Intersections were in the order of 1.09% WO₃ over 0.5 m and 0.3% Cu over 1 m, and the degree and extent of pervasive hydrothermal alteration was widespread. The hypothetical model included as an inset on Figure 1 summarizes the main features observed on the property and

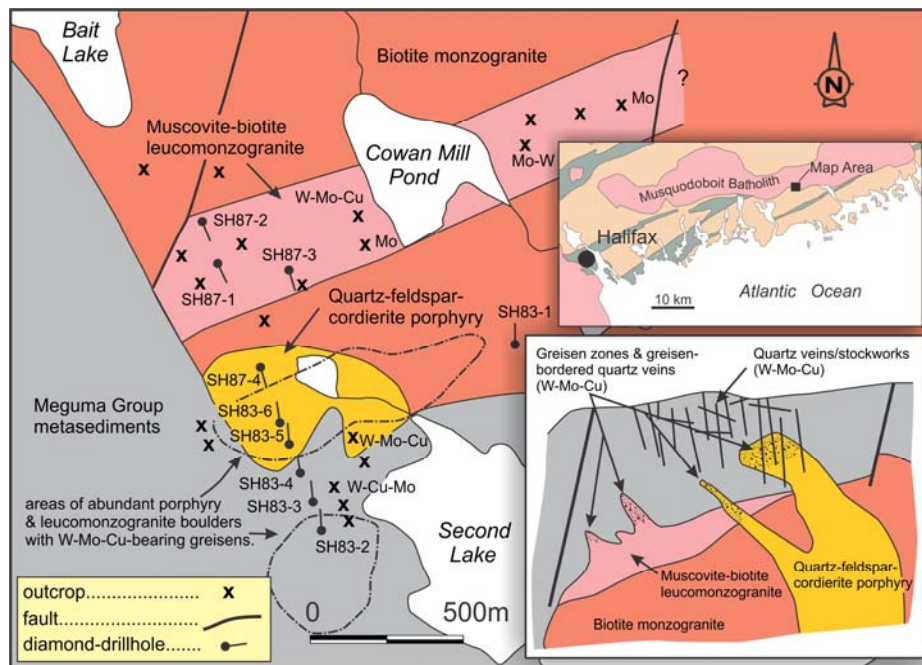


Figure 1. Tungsten (W) occurrences of the Cowan Mill Pond and Second Lake areas near Lake Charlotte, Halifax County. Inset (lower right) is a hypothetical cross-section summarizing the main features of the mineralization styles observed in the area (modified after Corey, M. C. 1993: *Polymetallic W-Mo mineralization and associated alteration in the eastern Musquodoboit Batholith*; in *Mines and Minerals Branch Report of Activities 1992*; NSDNR, Report 1993-1, p. 31-44).

indicates that the area represents a typical highly evolved cupola developed in the endo-contact zone of a peraluminous granite batholith.

Even though the property shows lots of promise, why has it not seen the exploration attention it seems to deserve? There are a couple of main reasons. The property showed potential for W, but there was not much Sn. In those days people were looking for Sn deposits and had little interest in W. The lack of Sn there was thought to be peculiar, but this aspect was never fully examined. Are tin-rich zones present but not yet found? Just how much W is there? Neither of these questions has been answered. In 1983 when the property was discovered and being explored, the Sn exploration boom was already in its waning stages and by 1985, when the Sn price plummeted

and the global Sn cartel collapsed, the exploration industry simply lost interest. Likewise, in the early 1980s the price of W dropped to \$2.50/lb. (US\$), remained low for many years, and had a dismal long-term outlook.

We are now in a different era. Since the late 1990s the price of tungsten has been on the rise, and since 2005 it has been in the \$15-\$20/lb. (US\$) range. Furthermore, the future outlook for the metal is strong. Global reserves of W are dropping, and China, which exports 70% of the world's W, is requiring more and more for its own internal demand. It is clear that W is being added to the list of strategic metals that the free world needs secure access to. As a result people are looking and the Cowan Mill Pond area deserves a peek.

G. A. O'Reilly

Government Plans Review of the *Mineral Resources Act*

Aligned with the good governance goals of the Natural Resources Strategy, the department is committed to reviewing and modernizing the *Mineral Resources Act*. Senior staff in the Mineral Resources Branch, in collaboration with colleagues in the department's Policy and Planning Branch and the Department of Justice, are planning the process and schedule for the review. It is anticipated the review will be initiated in 2013. It may take several years to complete the review and pass a revised *Mineral Resources Act* considering the size and breadth of the legislation, its significance to the province and industry, and that it was last reviewed in 1990.

The review process will include opportunities for consultation, and for receiving input for consideration from industry, non-government organizations, the public, other government departments and other levels of government. The Nova Scotia Department of Natural Resources will communicate the review process, consultation plan and schedule to stakeholders once these have been developed.

In the immediate term, the department is also working on changes to some of the regulations attached to the *Mineral Resources Act*. In particular, changes to regulations necessitated by launch of the new, web-based (online) Registry of Mineral and Petroleum Rights system will need to be implemented when the new registry goes online in the first half of 2013 (see article on p. 2).

Donald James

October - December 2012 Open Assessment Reports

Report Number	NTS	Licensee
AR ME 2010-102	21A/09C; 21A/10D; 21A/16B	Cornerstone Resources Incorporated
AR ME 2010-103	11D/15D	Globex Mining Enterprises Incorporated
AR ME 2010-104	11E/03B	Grant, S
AR ME 2010-105	11F/14C, D	Glencoe Resources Incorporated
AR ME 2010-106	11D/12D	Hilchey, A F
AR ME 2010-107	21A/07C	Grant, S
AR ME 2010-108	11F/05A	Jewers, R
AR ME 2010-109	11E/01D	Jewers, R
AR ME 2010-111	21A/04A	Avalon Rare Metals Incorporated
AR ME 2010-112	11F/09C	Richman, J
AR ME 2010-113	11D/15C	DDV Gold Limited
AR ME 2010-114	11D/15C	DDV Gold Limited
AR ME 2010-115	11E/02D	Grant, S
AR ME 2010-116	11D/15C	DDV Gold Limited
AR ME 2010-117	11F/04C; 11F/05B	Hudgtec Consulting Limited
AR ME 2010-118	11E/05B	Rose, J M
AR ME 2010-120	11E/01D; 11E/08A	Acadian Mining Corporation; Annapolis Properties Corporation
AR ME 2010-121	11E/11B	Alpha Uranium Resources Incorporated
AR ME 2010-122	11D/11C	Nycon Resources Incorporated
AR ME 2010-123	11D/16C	Nycon Resources Incorporated
AR ME 2010-124	11E/11B	Clear Lake Resources Incorporated
AR ME 2010-125	11E/03B	Scozinc Limited
AR ME 2010-126	11F/14D; 11K/03A	Grant, S; MacLean, L
AR ME 2010-127	21A/02D	Alpha Uranium Resources Incorporated; Magnum Resources Incorporated
AR ME 2010-128	11E/09B	Minotaur Atlantic Exploration Limited
AR ME 2010-129	11E/01D	Jewers, R
AR ME 2010-131	11E/01A	DDV Gold Limited
AR ME 2010-132	11D/16C	Dufferin Resources Incorporated
AR ME 2010-133	21A/06A	Hiltz, K R
AR ME 2010-134	21A/06A	Hiltz, K R
AR ME 2010-137	11E/01C	DDV Gold Limited
AR ME 2010-138	11E/04B	Grant, S
AR ME 2010-139	21A/04A, D	Avalon Rare Metals Incorporated
AR ME 2010-140	21A/08C	Globex Mining Enterprises Incorporated
AR ME 2010-141	11E/02D	6179053 Canada Incorporated
AR ME 2010-142	11F/04C; 11F/05B	DDV Gold Limited
AR ME 2010-143	11D/15C, D	Scratch Exploration and Mining Corporation Limited
AR ME 2010-144	11D/14A; 11D/15B	Hilchey, A F
AR ME 2010-145	11E/02D	Shadbolt, D
AR ME 2010-146	11K/10A	Richman, J
AR ME 2011-047	11D/16D	Scratch Exploration and Mining Corporation Limited
AR ME 2011-053	11D/16C	Dufferin Resources Incorporated
AR ME 2011-064	11F/15C	Merrex Gold Incorporated
AR ME 2011-080	11E/04B	Annapolis Properties Corporation

Susan Saunders

Nova Scotia Runs with Geoheritage Concept

The concept of geoheritage is finding fertile ground in the geological wonderland of Canada, led by the country's provincial and territorial geological surveys. And the surveys seem to like what we are doing — or at least saying — here in Nova Scotia.

In November, I was invited to give the Charles Camsell Talk at the Prince of Wales Northern Heritage Centre. The Camsell talk kicks off the Yellowknife Geoscience Forum, a vibrant conference attended by more than 800 delegates. In February I received another invitation, this time to speak on geoheritage at the Johnson Geocentre in St. John's, with a focus on the recognition of Joggins Fossil Cliffs as a UNESCO World Heritage Site. The Johnson Geocentre talk, which like the Camsell talk reaches out to the public, coincides with the spring divisional meeting of the Geological Association of Canada, February 18-19th in St. John's, the theme of which is geoheritage. Whatever the reason, whether it be increased public awareness of issues facing the Earth or that we geologists have finally found in geoheritage a way of engaging the public, the time for geoheritage, and Nova Scotia's approach to it, seems to be now.

John Calder

Mineral Resources Branch Welcomes Hydrogeologist John Drage

The Mineral Resources Branch is pleased to welcome John Drage as a member of our staff. John is a hydrogeologist with over 18 years of experience on water resource projects in Canada and overseas. He began his new position with DNR in December 2012 and will be working with the Geological Services Division focusing on groundwater resource work.

John holds a B.Sc. in Geology from Dalhousie and an M.Sc. in Civil Engineering – Hydrogeology from the University of New Brunswick, and is a Registered Professional Geoscientist in Nova Scotia. He began his geology career as summer student with the Nova Scotia Department of Mines and Energy and went on to work as a consultant on a range of mineral resource, water supply and environmental projects in Atlantic Canada, New Zealand, Australia and the Philippines.

For the past 10 years John has worked for Nova Scotia Environment as their Senior Hydrogeologist responsible for groundwater resource management. During this time he has been involved in a number of projects with DNR staff, including work on naturally occurring radionuclides in drinking water with George O'Reilly and arsenic in well water with Terry Goodwin. Over the last five years John

has been working closely with Gavin Kennedy on a wide range of groundwater projects that were carried out as collaborations between DNR and Nova Scotia Environment.

With approximately half of Nova Scotians relying on aquifers for their drinking water, groundwater plays an important role in our economy and in maintaining a healthy environment. John's addition to the department allows us to build on our existing capacity to provide the scientific advice needed to manage this valuable natural resource.

Brian Fisher



John Drage



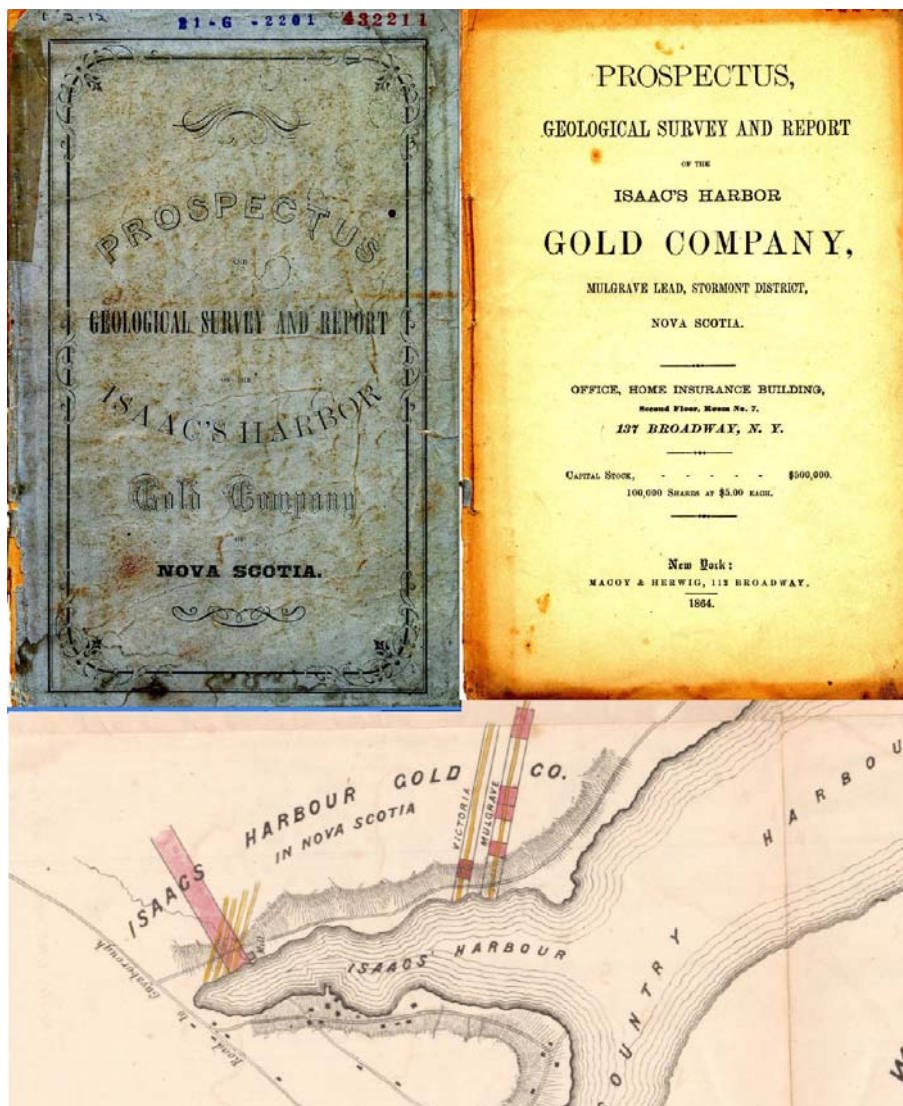
From left, George O'Reilly, Chris White, Don James, Diane Webber, Bob Ryan and Gavin Kennedy view pillow basalts and other features at the East Mountain quarry during a Geological Services Division field trip in November 2012.

965 Archived Assessment Reports Posted in January: Almost Back to Samuel Champlain

The Mineral Resources Branch has been making a concerted effort to scan and make available to our clients, not only the assessment reports that recently became non-confidential, but also to work back in time and scan archived reports, such as the 1864 document shown below. In January the branch released 965 archived assessment reports. A complete list of these reports can be found at http://www.gov.ns.ca/natr/meb/download/ar_release_jan2013.asp. This release, combined with the 2000 reports released in July 2012, made a huge dent in the backlog.

There are about 7700 open assessment reports in the NovaScan database. Nearly 7150, or 93 per cent, have been scanned and have associated PDFs available on the branch website. This leaves about 550 reports that need to be scanned. Of these, 329 are petroleum-related reports that will require the permission of the Department of Energy to scan. The outstanding 225 documents will require some detective work to track down in Halifax, Stellarton and in the microfilm archive. An added benefit of this work is that about 100 reports were found that were not indexed in NovaScan. These will be indexed and made available as time allows.

Jeff Poole



Special Notes

E-mail Notification

If you would like to receive an e-mail notice (with hot links) when new maps, digital products and publications are released, or when a new issue of the *Nova Scotia Minerals Update* is released, please send your e-mail address to minerals@gov.ns.ca.

Nova Scotia Mineral Incentive Program (NSMIP): Prospector Marketing Grants

The Mineral Resources Branch is still accepting applications for Prospector Marketing Grants under the 2012-2013 NSMIP. Grants up to \$1,250 are available to prospectors who apply to attend mineral industry conferences and/or trade shows in order to market NS mineral properties for option or sale. For more information please visit the branch website: <http://www.gov.ns.ca/natr/meb/ns mip/ns mip.asp>.

Dates to Remember

January 18 to April 30, 2013

The travelling exhibit *Gold: a Nova Scotia Treasure* is now on display at the Art Gallery of Nova Scotia in Halifax. The exhibit not only depicts the history of gold mining in the province, but also highlights the significance this brilliant metal has held in shaping human society. On display are spectacular gold specimens, historic photographs, and valuable artworks and awards. For more details please visit the website: www.artgalleryofnovascotia.ca/en/AGNS_Halifax/default.aspx.

March 3-6, 2013

Prospectors and Developers Association of Canada 2013, Metro Toronto Convention Centre-South Building, Toronto, ON. For more information please visit the website <http://www.pdac.ca/pdac/conv/>.

May 22-24, 2013

GAC-MAC 2013, Winnipeg Convention Centre, Winnipeg, MB. For more information please visit the website <http://gacmacwinnipeg2013.ca/>.