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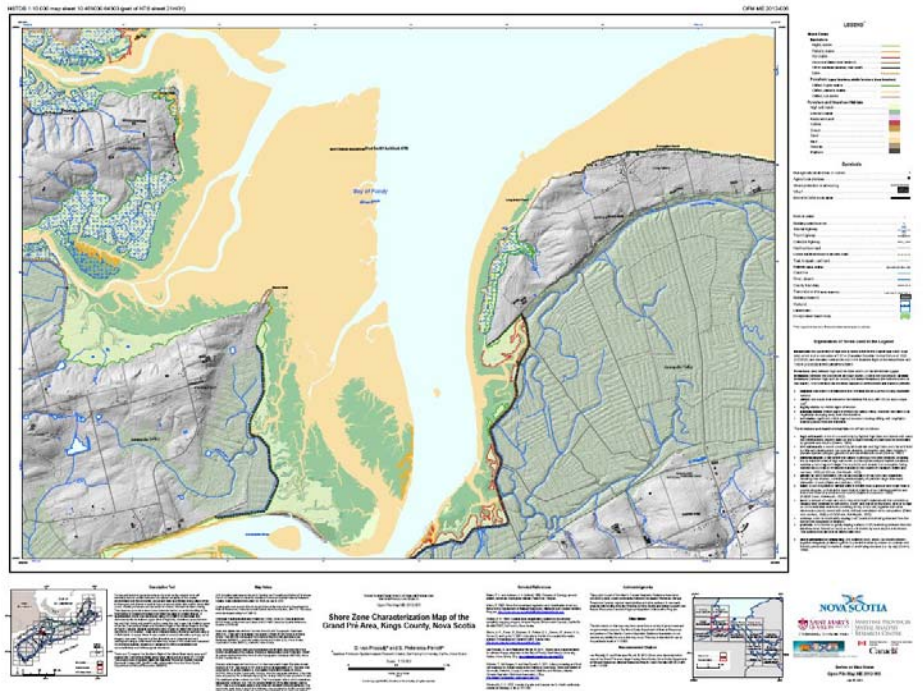


Mapping Coastal Change and Flood Risk in Nova Scotia

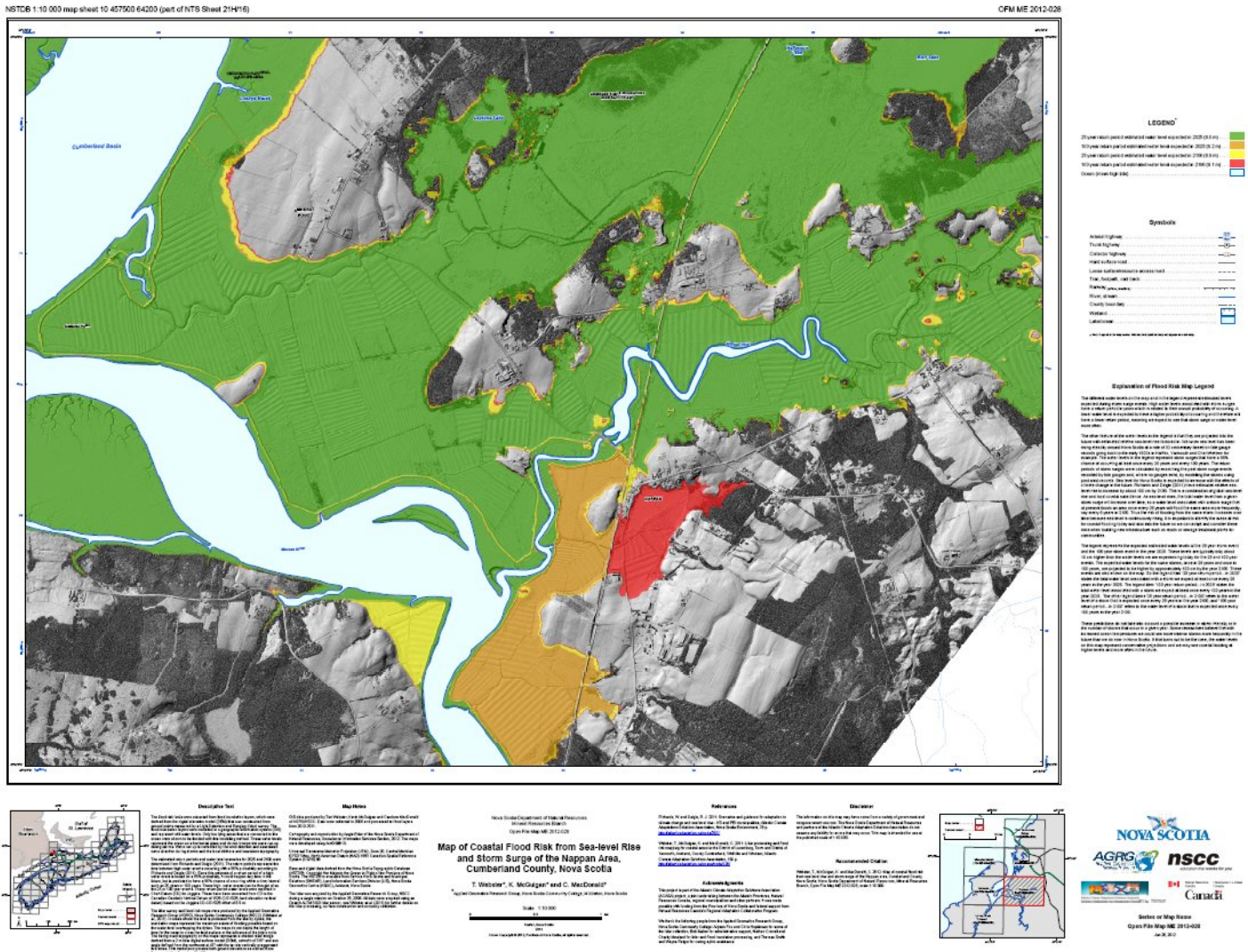
The Geological Services Division (GSD) of the Nova Scotia Department of Natural Resources (DNR) operates a long-term program to map the vulnerability of the province's coast to flooding and erosion. The goal of this program is to provide relevant geoscience information and expertise to provincial and municipal agencies that work to plan for storm events, sea-level rise and climate change in coastal areas.

Over the past few years the GSD has participated in a number of projects as part of the Regional Adaptation Collaborative (RAC) Atlantic Climate Adaption Solutions (ACASA) program. This has been a joint undertaking among the Atlantic Provinces, Natural Resources Canada, regional municipalities and other partners. It was made possible with funding from the Province of Nova Scotia and federal support from Natural Resources Canada's Regional Adaptation Collaborative Program.

As part of this work the division published 74 Open File Maps in July. These include a series of 22, 1:10 000 scale shore zone characterization maps produced by Danika van Proosdij and Barbara Pietersma-Perrott of Saint Mary's University,



The above image is from Open File Map ME 2012-005 and shows an example of the shore zone characterization maps published in July. The web link to this map is: http://www.gov.ns.ca/natr/meb/download/mg/ofm/htm/ofm_2012-005.asp.



The above image is from Open File Map ME 2012-028 and shows an example of the maps of coastal flood risk from sea-level rise and storm surge published in July. This map can be accessed through the branch web site: http://www.gov.ns.ca/natr/meb/download/mg/ofm/htm/ofm_2012-028.asp.

Maritime Provinces Spatial Analysis Research Centre (Open File Maps ME 2012-002 to –023). This work covered two areas in the Southern Bight of the Minas Basin (15 maps) and the Cumberland Basin (7 maps). The other 52 maps constitute a series of 1:10 000 scale maps showing the risk of coastal flooding, sea-level rise and storm surge. This series of maps was produced by Tim Webster, K. McGuigan and C. MacDonald of the Applied Geomatics Research Group, Nova Scotia Community College (Open File Maps ME 2012-024 to –075). These maps cover five areas around Lunenburg (10

maps), Amherst (6 maps), the Minas Basin (22 maps), Oxford (5 maps) and Yarmouth (9 maps). Cartographic work to produce the maps was accomplished by Angie Ehler of the Geological Services Division, with editing by Kathy Mills and Eugene MacDonald, who were contracted by the division. A complete listing of the maps and a link to Open File Report ME 2012-004, which provides more information on DNR’s participation in other ACASA-related project work, can be found on the Mineral Resources Branch web site: <http://www.gov.ns.ca/natr/meb/data/pubs/rn/rn2012-07-10.pdf>.

These projects have been a very good experience for the Geological Services Division to build working relationships with government and non-government agencies dealing with coastal science and climate change. The division’s Environmental Geology Program has benefited from this exercise to better understand coastal processes and learn how to map the coastline and produce products that will be useful to coastal communities, planners and individuals making land-use decisions along the coastline.

Jeff Poole, Brian Fisher and Angie Ehler

Abandoned Mine Openings: Protecting Public Safety

The province of Nova Scotia recently achieved an important milestone in safety. Through a long-term program called the Abandoned Mine Openings (AMO) Remediation Program, which began in 2001, the province has eliminated the risk of serious injury or death resulting from someone falling into an abandoned mine opening on Crown land.

Nova Scotia is home to some of the earliest mining activity in all of Canada. Coal, iron ore, gypsum and gold mining began here in the late 1700s. As a result, there are some 7,000 known mine openings throughout the province.

Over the past eleven years, the AMO program, which is managed jointly by the Mineral Resources and Regional Services branches of DNR, has invested about \$500,000 to remediate the most hazardous of these openings on Crown land. About 1,350 less-hazardous openings remain to be remediated on Crown land. Many are either located in very remote areas or are in such a state that they pose little or no risk of injury to the public.

Private land owners are encouraged to do the same type of remediation work on the more than 5,000 AMOs known to exist on their properties. Tragically, there have been three fatalities in AMOs on private land in the province. The last such event occurred in 1963.

Based on a priority listing, work scheduled for 2012 includes the first year of a three- to four-year program to address mine openings and subsidence features associated with historical mining in the Joggins, River Hebert and Chignecto areas of Cumberland County. Initial work at Joggins and Chignecto will address 30 AMOs and more than 150 subsidence features which are remnants of 270 years of coal mining in the district. AMO remediation work is also scheduled this year for Caribou Mines, Goldboro, Little Liscomb and Westfield.

The AMO program is overseen by a Steering Committee, which consists of the Executive Directors of DNR's Mineral Resources, Regional Services



Concrete cap on the King Fissure shaft in North Brookfield, Queens County.

and Land Services branches. About \$50,000 is invested in the program each year. A list of AMO areas on Crown land has been prioritized, and the work plan for each year is determined primarily on the basis of the priority listing. Other factors may be considered, however, such as newly discovered hazardous openings or fill settlement in previously remediated high priority openings.

AMOs are spread across about 135 sites throughout the province and each site may host anywhere from 1 to 250 openings. The hazard associated with these AMOs ranges from extremely dangerous to no significant hazard. Most of the AMOs in the province (including those on private land) have been given a hazard rating, ranging from Type I (inescapable) to Type IV (no significant hazard). One of the main objectives of the AMO Remediation Program is to address all of the Type I AMOs on Crown land and this is what has now been achieved.

Over the past 11 years, 15 different contractors as well as Transportation and Infrastructure Renewal (TIR) staff have been involved in the remediation work. Not only have all of the Type I

hazards on Crown land been addressed but also some 550 other potentially hazardous AMOs.

Methods for remediating AMOs include: backfilling, fencing and placement of concrete caps over the mine opening. TIR plays a major role in the AMO Remediation Program, both in carrying out work with its own crews and in tendering and managing contracted work. In the past 11 years TIR has backfilled more than 200 AMOs, capped 4 mine openings (3 at Caribou Mines and 1 at New Ross) and assisted DNR staff in the placement of a grate to protect an important bat habitat at Lake Charlotte. Besides the work conducted by TIR at Lake Charlotte, Terra Marine Environmental has been involved with the placement of two such closures at Glenelg and Londonderry. Another potential bat habitat at Bass River of Five Islands, located on land recently acquired from a lumber company, is tentatively scheduled for remediation in 2013.

Further information may be obtained by contacting the Regional Geologist in each region, or Mr. Ernie Hennick of the Mineral Resources Branch (phone 424-5764 or HENNICEW@gov.ns.ca).

Ernie Hennick and Patrick Whiteway

Two Thousand Archived Assessment Reports Posted in June

The Mineral Resources Branch has been working to scan all newly open (i. e. non-confidential) assessment reports and post them on the branch web site for a number of years. Along with the open assessment reports, we have been working back into the archive of old documents and scanning and converting these as time and money allows. Last winter we sent over 2000 documents out for scanning. These documents were further processed this spring and summer by students to make them easier to view and download from the internet.

In June the branch posted this harvest of nearly 2000 archived assessment reports. Links were made in the NovaScan database and a complete list of reports can be found at http://www.gov.ns.ca/natr/meb/download/ar_release_june2012.asp. There are about 7700 open assessment reports in the NovaScan database. Nearly 6200, or 80 per cent, have been scanned and have associated PDFs available. This leaves about 1500 documents left to scan.

Jeff Poole



The above photo shows boxes of assessment reports in storage in the bowels of Founders Square in Halifax. The inset image in the upper left shows a paper copy of an assessment report, while the inset image in the lower right shows the same document on a PC after it has been scanned and processed to a Portable Document File (PDF).

47th Annual Nova Scotia Gem and Mineral Show in Parrsboro

This summer, consider taking the time to enjoy a weekend of rockhounding in Parrsboro on the shores of the scenic Bay of Fundy. The 47th annual Nova Scotia Gem and Mineral Show and Sale will take place August 17, 18 and 19, 2012. More than thirty exhibitors from across the country will gather to showcase their treasures of fine mineral specimens, gems, fossils, jewellery and much more. There will be geological field trips and interpretive walks where you can learn about the unique geology of the Parrsboro area, where the world's highest tides constantly reveal new evidence of an ancient past. Demonstrations of gem cutting and jewellery making, gold panning, wire wrapping and more will take place at the Parrsboro Lion's Recreation Centre, Western Avenue, throughout the weekend.

Geologists from the Nova Scotia Department of Natural Resources will showcase rock and mineral specimens native to the province and, in partnership with the Atlantic Geoscience Society, Nova Scotia Prospectors Association and Nova Scotia Gem and Mineral Society, will be on hand to identify the unknown mineral treasures found by visitors. The Royal Ontario Museum has provided its Crystal System Display for the show. Geological walks will feature the spectacular exposures at West Bay (10:30 am Friday), Five Islands Provincial Park (10:15 am Saturday) and Clarke's Head (10:45 am Sunday). There will be demonstrations on how to cut agate and turquoise, using a rock tumbler, faceting, healing stones, and many ways to craft beautiful rocks,

gems and minerals. The Nova Scotia Metal Arts Guild will also be on hand to display the work of Nova Scotia silversmiths and goldsmiths, and to demonstrate the skills used in this art form.

Admission to this family-friendly event is \$3 per person (children under 12 admitted free) and exhibit hours are 10 am – 7 pm Friday and Saturday, and 10 am - 5 pm on Sunday, August 19. In association with the region's Wild Blueberry Festival, blueberry cake will be served each afternoon. For more information please call the Fundy Geological Museum at 902-254-3814 or to see the full schedule of events for this year's Gem and Mineral Show visit the web site <http://museum.gov.ns.ca/fgm>.

Diane Webber

Nova Scotia Mineral Incentive Program Under Way

The Nova Scotia Mineral Incentive Program (NSMIP) was officially launched this summer (see *Nova Scotia Minerals Update*, v. 29, no. 2), and July 27 was the deadline for applications. The department received approximately 40 applications for Prospector Grants and approximately 30 applications for Advanced Project Grants. Members of the NSMIP Evaluation Committee are currently meeting to evaluate the applications and award grants to both groups of applicants. After preliminary review it looks like the program will be fully subscribed for 2012, as high-quality prospecting and advanced exploration programs were proposed for areas throughout the province.

Grants of up to \$15,000 are available to eligible prospectors for grass-roots or early stage mineral exploration activities and grants up to \$100,000 will be available for advanced-stage mineral exploration projects. Funds awarded for advanced-stage programs must be matched by the applicant. The NSMIP will also provide funding for a prospector training program to support introductory

and continuing training on exploration techniques, safety, regulations and business development. The program will provide funds to support prospectors with marketing, promotional activities and attendance at mining investment conferences such as the annual Prospectors and Developers Association of Canada (PDAC) conference, held in Toronto.

The NSMIP is intended to attract new mineral exploration investment to the province and grow Nova Scotia's economy. The program will assist prospectors and exploration companies in their search for economic mineral deposits leading to new mines, secondary mineral processing opportunities, and growth in employment and wealth in Nova Scotia.

For more information on the Nova Scotia Mineral Incentive Program, please visit the web site: <http://www.gov.ns.ca/NATR/MEB/nsmip/nsmip.asp>.

Diane Webber and George O'Reilly



The Nova Scotia Mineral Incentive Program will assist prospectors and exploration companies in the search for economic mineral deposits in Nova Scotia. Mineral exploration and development activities, like the operation of this diamond-drilling rig, play a vital role in the economy of Nova Scotia.

Geological Services Division Welcomes Sonya Cowper

In any large organization change in personnel is inevitable and the Geological Services Division of DNR is no different. With the retirement of Norm Lyttle last year as manager of the Geoscience Information Services Section, and the promotions of Brian Fisher to manager and Jeff Poole to GIS supervisor, the division has had the good fortune to backfill Jeff's former GIS Specialist position and gain some new blood and valuable expertise at the same time.

The Information Services and Environmental Geology Section welcomed Sonya Cowper (pronounced "Cooper") as its new GIS Specialist this spring. Sonya received her Bachelors degree (Honours) in Geography from Sir Wilfred Laurier University in Waterloo,

Ontario, and completed an Advanced Diploma in GIS from the Centre of Geographic Sciences in Lawrencetown, Nova Scotia. She has worked in the GIS sector in private industry and for municipal and provincial governments. Her last position was with Halifax Regional Municipality, where she was a GIS Programmer Analyst since 2003. Sonya brings a solid background in Internet Map Servers, the tools for delivering maps and GIS data on the internet, as well as strong GIS programming skills. These are skills that will help the Geological Services Division deliver geoscience data to clients and provide the online tools to easily use the information.

Jeff Poole



GIS Specialist Sonya Cowper.

Studying Tectonics with Magnetism

This year we celebrate 200 years of peace with the USA following the War of 1812, and what better way to mark the event than by having a friendly invasion of American geologists from New England on the Avalonian shores of northern Nova Scotia. For eight of the hottest days in early July, Drs. Laurie Brown (University of Massachusetts), Meg Thompson (Wellesley College) and Sandra Barr (Acadia University), together with field support from Drs. Christopher Condit (University of Massachusetts), Randy Shull (Wellesley College) and Chris White (DNR) collected over 100 rock cores and samples for paleomagnetic studies.

The first two days were spent doing a reconnaissance sampling program from key units in the recently mapped Antigonish Highlands, including volcanic and sedimentary rocks in the Late Neoproterozoic Chisholm Brook, James River and Bears Brook formations, and sedimentary units in the



Dr. Laurie Brown (in red) drills in a bed of red sandstone in the Bears Brook Formation, trying to aim the hollow drill perpendicular to bedding. Dr. Christopher Condit (in blue) acts as field assistant, carrying a large plastic bottle of water and drilling fluid, which is pumped over the hollow drill bit continuously to prevent damage.

April - June 2012 Open Assessment Reports

Report Number	NTS	Licensee
AR ME 2010-048	11E/02A	Annapolis Properties Corporation
AR ME 2010-049	11E/02C	Scozinc Limited
AR ME 2010-050	11E/08D	Mazerolle, G J
AR ME 2010-051	11E/04A, B	DDV Gold Limited
AR ME 2010-052	11E/02D	Acadian Mining Corporation
AR ME 2010-053	11F/04D	Elk Exploration Limited
AR ME 2010-054	11F/14C	MacLennan, L
AR ME 2010-055	11F/14C	MacLellan, L
AR ME 2010-056	21A/06A	Banks, D V
AR ME 2010-057	11E/02C; 11E/03A	Scozinc Limited
AR ME 2010-058	21A/04A, B	Avalon Rare Metals Incorporated
AR ME 2010-059	11F/16B, C	Yava Technologies Incorporated
AR ME 2010-060	11F/16B, C	Yava Technologies Incorporated
AR ME 2010-061	11E/03D; 11E/06A; 11E/07B	Scozinc Limited
AR ME 2010-062	11D/15C; 11E/02B	DDV Gold Limited
AR ME 2010-063	21A/07C	Hiltz, K R
AR ME 2010-064	11E/01C; 11E/02D	6179053 Canada Incorporated
AR ME 2010-065	11D/15C	Meguma Resource Enterprises Incorporated
AR ME 2010-066	11E/02B	DDV Gold Limited
AR ME 2010-067	11E/03B	Elk Exploration Limited
AR ME 2010-068	11E/03B	Elk Exploration Limited
AR ME 2010-069	11E/05A; 21H/01D	Scozinc Limited
AR ME 2010-070	11D/13A	Hilchey, A F
AR ME 2010-071	11D/16C	Acadian Mining Corporation
AR ME 2010-072	11K/01C	Richman, J
AR ME 2010-073	11D/12D	Hilchey, A F
AR ME 2010-074	11K/07D; 11K/10A	Richman, J
AR ME 2010-075	11K/01B	Silvore Fox Minerals Corporation

Susan Saunders

lower parts of the Silurian Arisaig Group. The rest of the trip was concentrated in southeastern Cape Breton Island (Mira terrane) to build on paleomagnetic studies done by Dr. Thompson in 2006. Volcanic and volcanoclastic rocks were sampled from the Late Neoproterozoic East Bay Hills, Main-à-Dieu, and Coxheath Hills groups, the Late Neoproterozoic to Cambrian Kelvin Glen formation, and the Devonian Salmon River porphyry.

All samples will be analyzed using the most modern methods in the state-

of-the-art Paleomagnetic Laboratory at the University of Massachusetts, under the direct supervision of Dr. Brown. Although paleomagnetism has wide application in many areas of geoscience, including structure, tectonics, stratigraphy and petrology, we are using the technique in hope of understanding Avalonia's original geographic position and its subsequent drift history up to its collision and interaction with North America.

Chris White

Geology Matters 2012: Growing the Economy

The new Nova Scotia Mineral Incentive Program (NSMIP; see p. 5) means that this summer should prove to be a busy one for prospectors and companies exploring for economic mineral deposits in the province. Geology Matters 2012 will be the best place to hear about the exciting results of this field season and the vital impact that the mineral industry has in growing the economy of Nova Scotia.

Online registration is now open for the Nova Scotia Department of Natural Resources' 36th annual fall conference on October 29 and 30 at the Westin Hotel in Halifax. Geology Matters 2012 will attract a broad audience around the theme *Growing the Economy*. DNR staff, prospectors, exploration companies and

numerous related associations will showcase their initiatives, exploration activities and results.

The program will include presentations, luncheons, workshops, and the annual Minister's Reception and Award Ceremony hosted by the Honourable Charlie Parker, Minister of Natural Resources. Current information about the conference and online registration forms can be found on the Mineral Resources Branch web site (<http://www.gov.ns.ca/natr/meb/oh/index.asp>). For further information please contact Diane Webber (phone 902-424-3053 or e-mail WEBBERDE@gov.ns.ca).

Diane Webber

Geology Matters 2012 Conference
October 29th and 30th, Westin Hotel, Halifax, Nova Scotia

Highlights

- Exhibits, Presentations
- Geological Resources and the Economy
- Geoscience and Municipal Planning
- Nova Scotia's Energy Future
- Geohazards: Protecting Health and Safety
- Geoheritage and Economic Growth
- New Strategies for Managing Nova Scotia's Resources
- Student Workshop

For more information contact:
Diane Webber
tel: 902 424-3053
email: webberde@gov.ns.ca

Register online: <http://www.gov.ns.ca/natr/meb/oh/index.asp>
Free Admission to Displays and Technical Talks

Nova Scotia Seen as a National Leader in Aboriginal Consultation

Providing timely information to the Mi'kmaq is an essential step in successful mine building in Nova Scotia. The Mineral Resources Branch of the Nova Scotia Department of Natural Resources accomplishes this through the 2010 Mi'kmaq-Nova Scotia-Canada Consultation Terms of Reference and two formalized venues: (1) a bi-annual (twice per year) 'Mining Consultation Table' with the Mi'kmaq and (2) by encouraging proponents of mining projects to engage with the Mi'kmaq as early as possible. The latter is accomplished through the government's 'One Window' process for mineral development projects.

The most recent meeting of the 'Mining Consultation Table' on May 2, 2012, was held at the Nova Scotia Office of Aboriginal Affairs in Halifax. Updates were provided on the most advanced mining projects in the province (Donkin, Gays River, Touquoy, Dufferin, Stellarton and Cobequid Bay), and exploration projects where diamond

drilling took place in 2011 were reviewed (Brazil Lake, Mount Cameron, Coxheath, Harrigan Cove, Inglisville and Mill Village). Mine reclamation projects at Sugar Camp, Wentworth, Melford and Point Aconi were also briefly discussed.

In place now for several years, the Consultation Terms of Reference and these two formal processes have earned the provincial government positive comments from the Mi'kmaq and Chief Terry Paul, who is responsible for the mining portfolio and is also co-Chair of the Assembly of Nova Scotia Mi'kmaq Chiefs. At a national meeting that he hosted in Membertou, N.S., on May 30 and 31, 2012, Chief Paul extolled the virtues of the Nova Scotia consultation process to a national audience of Aboriginal leaders. Called the 'National Aboriginal Economic Development Board', this group of nine leaders is charged with providing policy advice to the federal government. From this particular

meeting, the board was to recommend ways of increasing Aboriginal participation in major resource projects to federal Minister of Natural Resources Joe Oliver.

In order to pass on some of the lessons learned in Nova Scotia, the Mineral Resources Branch was invited by the National Aboriginal Economic Development Board to provide a briefing on how Nova Scotia consults with the Mi'kmaq about mineral exploration and development activity in the province. That presentation was one of four made to the board during a session on regulation, and received positive feedback.

Engaging Nova Scotians in the planning and decision-making process in mineral resource development that affects their communities is an integral part of the province's Natural Resources Strategy, which was published by DNR in August 2011.

Patrick Whiteway

Status of the Registry Modernization Project

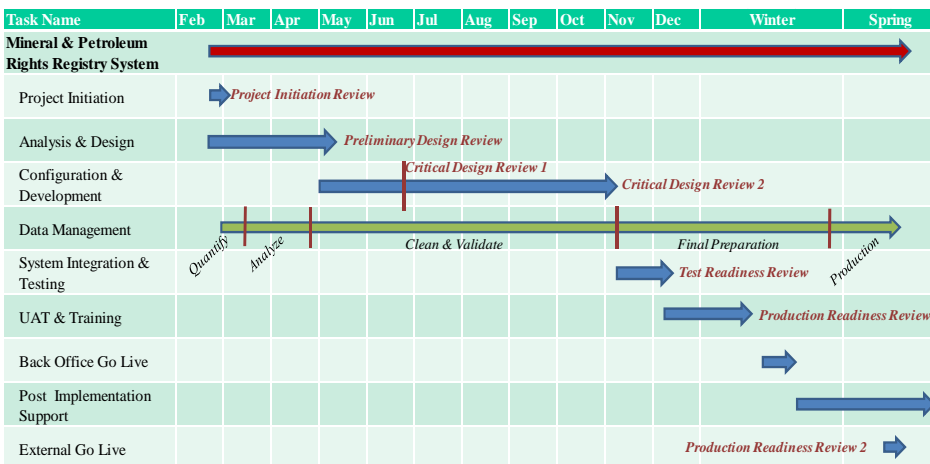
Mineral rights for land in the Province of Nova Scotia are reserved to the Crown, and administered by the Nova Scotia Department of Natural Resources. The landowner has the surface rights to the land but not the mineral rights. The department's Registry of Mineral and Petroleum Titles is responsible for receiving applications for mineral and petroleum rights, and for issuing and registering licences and leases. The registry has used a paper-based system for the issuance, tracking and management of mineral tenure for more than a century. As reported in the *Nova Scotia Minerals Update*, Spring 2012 edition, modernization of the Registry of Mineral and Petroleum Titles is moving forward with the objectives of providing more timely access to mineral rights information and enabling clients to acquire and manage mineral rights over the internet.

Pacific Geotech Systems Ltd., a British Columbia based company that has assisted British Columbia, New Brunswick and Manitoba in providing clients with similar tools to acquire and manage mineral rights, is developing the online registry system for Nova Scotia. The system will present current (real-time) mineral tenure information via web browser over the internet as a searchable map, accessible to any stakeholder. Through their account, clients will be able to apply for exploration licences and maintain existing rights from any location with internet access.

During the past spring and summer, activities have moved from the preliminary design stage to detailed design, which includes fine tuning of the requirements for configuring applications. Detailed design is concluding for several major business processes and configuration is complete for the system's Web Mapping and Finance modules. Work on data analysis and data migration continues in order to ensure a smooth transition from the paper-based system to the online final product.

The planned implementation is on track for an internal transition to the new system in early 2013, and the online "go live" will follow as testing is completed. The Registry of Mineral and Petroleum Titles will work with clients and industry groups to deliver information, seek input and answer questions as they arrive. A high level summary of the project schedule is shown below.

Sandy Nickerson and John MacNeil



Special Note

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.

Dates to Remember

August 17-19, 2012

Nova Scotia Gem and Mineral Show, Lions' Recreation Centre, Western Ave., Parrsboro, NS. For more information please visit the website: <http://museum.gov.ns.ca/fgm/en/home/whattoseedo/gemmineralshow/default.aspx>.

October 29 and 30, 2012

Geology Matters 2012, the Westin Nova Scotian Hotel, Halifax, NS. For more information please see p. 7 or contact conference co-ordinator Diane Webber at 902-424-3053 or by e-mail webberde@gov.ns.ca. Current information about Geology Matters 2012 will be posted on the Mineral Resources Branch website: <http://www.gov.ns.ca/natr/meb/oh/index.asp>.

November 1-3, 2012

Mineral Resources Review 2012, Delta St. John's Hotel and Conference Centre, 120 New Gower St., St. John's, NL. For more information please visit the web site: <http://www.nr.gov.nl.ca/nr/mines/mineral.html>.

November 4-6, 2012

Exploration, Mining and Petroleum New Brunswick 2012, Delta Hotel, Fredericton, NB. For more information please visit the web site: http://www.gnb.ca/0078/minerals/Exmin_Home-e.aspx.