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Minerals Update
Department of Natural Resources, Minerals and Energy Branch

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In This Issue

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NOVA SCOTIA
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Assistance Program Offers Long-term Commitment to Nova Scotia Prospectors

The new Prospectors Assistance Program, funded by the Canada—Nova Scotia Economic Diversification Agreement, is now under way. The program will provide a total of $600,000 in funding over a four-year period to supply training, financial assistance, and marketing assistance for qualified prospectors in Nova Scotia. Two Basic Prospecting courses were completed last fall under the new program, and applications are now being received from prospectors requesting financial assistance.

Staff of the Mineral and Energy Resources Division have established a committee to look after the three components of the program: prospector training, prospector assistance and marketing assistance. The staff members include Howard Donohoe (Program Coordinator), Bob Grantham, Bob Ryan, Ron Mills and Paul McCulloch. Bob Grantham is primarily responsible for the training component of the program and the remaining staff look after the financial and marketing assistance components.

Individuals interested in taking the Basic Prospecting course are not required to have any previous experience in prospecting. The basic course is designed to introduce the novice to the identification of rocks and minerals, understanding mineral occurrences, basic geology, prospecting, and government regulations regarding mineral exploration in Nova Scotia. The Advanced Prospecting course requires previous completion of the basic course and builds on the concepts and procedures covered in the basic course.

The prospector assistance component of the program provides direct financial aid to individual prospectors and explorationists in their search for new mineral deposits or to re-assess known mineral occurrences in the province. Prospector

Wynne Potter announces the participation of the Atlantic Canada Opportunities Agency (ACOA) in the Nova Scotia Prospectors Assistance Program. The program was officially unveiled at the Minerals and Energy Branch Review of Activities in November 1997.

assistance grants are not generally available to companies. The grants are cost-shared between the prospector and the Department of Natural Resources. Funds up to a maximum of $5000 will be made available for qualifying projects, with the prospector contributing the equivalent of $1500, either in direct funding or in-kind work. For grants less than $5000 a smaller, pro-rated contribution is required from the prospector.

Eligibility for funding requires that the applicant be a resident of Canada, be nineteen years of age or older, and have a valid Nova Scotia Prospector Identification Card. In addition, the applicant must be able to legally hold an exploration licence in Nova Scotia and demonstrate experience in prospecting or have completed at least a Basic Prospecting course. Applicants must not be an employee, consultant or contractor with NSDNR, ACOA or Natural Resources Canada.

Applicants for financial assistance must fill out an Application For Grant form which will include (1) information on eligibility, (2) a detailed description of the exploration project, and (3) a proposed budget. A review committee will assess the merits of the program based on the application and advise on acceptance of the project for funding. An information package is available that outlines in detail the eligibility requirements for financial assistance. Following completion of the exploration program, the applicant must fill out a Prospecting Report form which includes a detailed outline of the results of the work program and a financial report.

The marketing assistance component of the Prospectors Assistance Program provides direct financial assistance to individual prospectors and explorationists to help with promoting their mineral properties, such as funding for attendance at trade shows. Eligibility for funding requires that the applicant be a resident of Canada, be nineteen years of age or older, and hold an exploration licence in Nova Scotia. In addition, applicants must not be an employee, consultant or contractor with NSDNR, Nova Scotia Department of Economic Development and Tourism or ACOA. Eligibility for funding to attend trade shows generally requires that a representative of NSDNR also be in attendance.

Applicants for financial assistance must fill out a Marketing Assistance Contribution Application form which includes a travel budget, and must prepare a short description of the property. Funding to a maximum of $1600 is allowed under the program and is pro-rated according to the location of the trade shows. In addition, successful applicants who attend trade shows are required to fill out an information form specifying contacts made at the trade show and activity in the eight months after the trade show. This information will provide details on the success of the program over time.

Further information on the Prospectors Assistance Program and its various components is available from the department's Mineral and Energy Resources Division (902-424-4700). Inquiries should be directed to Dr. Howard Donohoe, Program Coordinator, or to other members of the program committee.

Paul McCulloch

Trade Shows an Important Part of Mineral Promotion Strategy

Encouraging mineral development and promoting mineral potential is important to the Minerals and Energy Branch year round. However, the pace quickens from the beginning of the Review of Activities in November to the end of the Prospectors and Developers Association of Canada (PDAC) annual meeting in March. This is the season for Canada's major mineral industry trade shows.

In the next two months the branch will attend the Cordilleran Roundup / Pathways 98 convention in Vancouver and the PDAC convention in Toronto. In each location we will have a major display, staff and literature to promote mineral development in Nova Scotia. With support from the marketing assistance component of the Prospectors Assistance Program (see previous article), local prospectors will also attend both of these trade shows.

Three prospectors will attend the Cordilleran Roundup/Pathways 98 convention. Each will have an opportunity to display their property information. At the PDAC, the Atlantic Provinces have cooperated to stage the Atlantic Canada Rock Room. The room gives each province six to eight booths for prospectors to market their properties, in addition to the government displays.

Both of these trade shows draw a multitude of people associated with the mineral industry. Large numbers of junior exploration companies and many senior companies use these shows as a means of networking. Inevitably, deals are reached with prospectors and developers. Having professional displays and high quality information boosts confidence and makes individual properties, as well as the whole province, attractive to investors.

When the trade shows are finished, more promotion work ensues. We follow up on leads from the shows to see if we can attract companies to Nova Scotia. We try to facilitate connections between individual claim holders and companies interested in certain commodities or mineral deposit models. Staff of the branch review and revise promotion strategies for the remainder of the year. After all, trade shows are just one way among many to promote the mineral resources of Nova Scotia.

Howard Donohoe

George Miller Begins Review of Minerals and Energy Branch

In November 1997, Justice K. Peter Richard released his report on the Westray Mine Public Inquiry. The inquiry was ordered in May 1992 following an explosion at the Westray Coal Mine which killed twenty-six miners in Plymouth, Pictou County. Justice Richard's report presented seventy-four recommendations aimed at avoiding a similar tragedy in the future. In December 1997, the Government of Nova Scotia released its response to the report of the Westray Mine inquiry, accepting all of the recommendations and setting out a timetable of actions to address these recommendations. Both the report of the Westray Mine inquiry and the government's response to the report are available for viewing at the DNR Library in Halifax.

One recommendation of the Report of the Westray Mine Public Inquiry was that "the structure and staff of the Department of Natural Resources undergo a complete and intensive review, preferably by an outside agency, with the objective of establishing an efficient and responsible mechanism for the supervision and husbanding of our natural resources". In its response to the report, the Government of Nova Scotia accepted this recommendation and has commissioned C. George Miller of the Industry Government Relations Group in Ottawa to carry out this study.

George Miller, a partner in the Industry Government Relations Group, is well known to most mining professionals as the immediate past Chairman of the Mining Association of Canada (MAC). He has extensive experience working in support of the mineral industry, both in government and with non-governmental policy organizations, on national and international stages. He has previously served as Director of the Centre for Resource Studies at Queens University and as an Assistant Deputy Minister in the Mineral Policy Sector of the former federal Department of Energy, Mines and Resources. While at the Mining Association of Canada, George was closely involved with development of the MAC Environmental Policy, the Whitehorse Mining Initiative, and the Keep Mining in Canada campaign. He is well aware of the importance of the mineral industry in Canada and of the role that governmental organizations play in relation to this industry.

The terms of reference of his study are available to the public in the DNR Library in Halifax. In general, they give him the mandate to:

- define the full extent of the department's duties and responsibilities related to minerals, mining and energy utilization, assuming that the dual roles of regulation and promotion present a conflict which will be removed through the elimination of regulatory functions;
- recommend the most effective structure and required inter-branch linkages within the department to carry out these responsibilities;
- identify the linkages which must exist between DNR and other departments and agencies of the provincial government so as to ensure that DNR's responsibilities are effectively carried out;
- identify the qualifications which staff of the Minerals and Energy Branch should possess to effectively administer these responsibilities; and
- identify the immediate and ongoing training requirements for the existing branch staff to allow them to meet these qualifications.

Mr. Miller will be required to define, in detail, the responsibilities which will remain after the removal of regulatory responsibilities from the Minerals and Energy Branch. He will recommend an organizational structure for the Minerals and Energy Branch which will result in effective administration of these responsibilities. He will also recommend the relative level of emphasis that should be placed on each of these responsibilities in the future. In addition, Mr. Miller will recommend the appropriate allocation of existing resources within the branch, and the programs that should be delivered in order to effectively administer these responsibilities and meet the needs of our clients.

The review was initiated in early January and George Miller will rely on information from a wide variety of sources during the course of this study, including literature search, his experience in the industry, interviews with management, staff and clients of the department, and discussions with other provincial and federal government officials as well as organizations such as the Chamber of Mineral Resources of Nova Scotia and the Mining Society of Nova Scotia. He welcomes comments or discussion from clients of the Minerals and Energy Branch, and any persons or organizations that would like to have input to the process can call his Ottawa office at (613) 232-1421, ext. 227, or fax (613) 232-9554. The final report is scheduled to be submitted to the Minister of Natural Resources by the end of March.

The Department of Natural Resources considers itself fortunate to have this study conducted by an individual of George Miller's calibre and experience. It is expected that his review of the organization will provide us with many valuable insights and suggestions as to how we should fulfill our mandate in the coming years.

Scott Swinden

Field Trip to the Ovens:
Flexural-slip Folding and the Formation of Gold-bearing Quartz

On October 29, one day before the Minerals and Energy Branch Review of Activities, DNR geologist Rick Horne (Fig. 1) guided us on a field trip to the Ovens. The group consisted of about a dozen DNR staff and an equal number of prospectors, industry and university geologists, and interested citizens. The coastal section at the Ovens and around Ovens Point on Rose Bay (Fig. 2) presents an excellent exposure of a gold-bearing vein system. This magnificent coastal exposure makes the Ovens the best place to examine structural control on the formation of gold-bearing quartz veins in the Meguma Group.

The Ovens Gold District is located in Lunenburg County, on a headland about 10 km southeast of the town of Lunenburg on the west side of Lunenburg Bay. The rocks belong to the Halifax Formation of the Meguma Group and consist of roughly 75% slate and 25% sandstone. Wave erosion of the mainly slate sea cliffs has formed deep indentations, known as ovens. The dominant geological feature is the Ovens Anticline, a chevron fold (a fold with planar limbs of equal length and a sharp, angular hinge) exposed at its hinge zone in the Ovens Natural Park and along the coast at Rose Bay (Fig. 2).

The Ovens was one of the first sites where gold was discovered in Nova Scotia. In 1861 a gold-bearing quartz vein was found on the sea cliff now known as Cunard Cove, and placer gold was found in the sand on the shore. In 1861 and 1862, about 2000 ounces of gold were produced from the beach sand at Cunard Cove. Unfortunately, that episode represents almost all of the gold produced from the district.

Erosion of the cliff at Cunard Cove, including both the gold-bearing bedrock and the gold-enriched till, led to this mechanical concentration of gold on the shore. Crevices in the shore rock are particularly good sites for gold panning, where debris from the cliff has been washed by waves and the heaviest particles remain.

Figure 1. Rick Horne uses a borrowed walking stick to point out buckled bedding-parallel veins at Cunard Cove.

Gold deposits in the Meguma Group consist of bedding-concordant (aligned with bedding surfaces) and bedding-discordant (intersect bedding surfaces) veins that were emplaced into the sedimentary sequence of host rocks as they were folded. The veins are mainly quartz, with minor carbonate and sulphide phases (such as pyrite, arsenopyrite, scheelite), and variable amounts of gold. Both bedding-concordant and -discordant vein types occur at the Ovens.

There are four types of veins at the Ovens (Fig. 3): (1) buckled bedding-parallel veins, (2) planar bedding-parallel veins, (3) saddle reef veins, and (4) bedding-discordant veins. At the Ovens, all of these vein types bear gold and the beach sands produce visible specks of gold by panning.

Buckled bedding-parallel veins are interpreted to have formed in the early stages of folding. **Planar bedding-parallel veins** commonly display a pinch and swell ge-

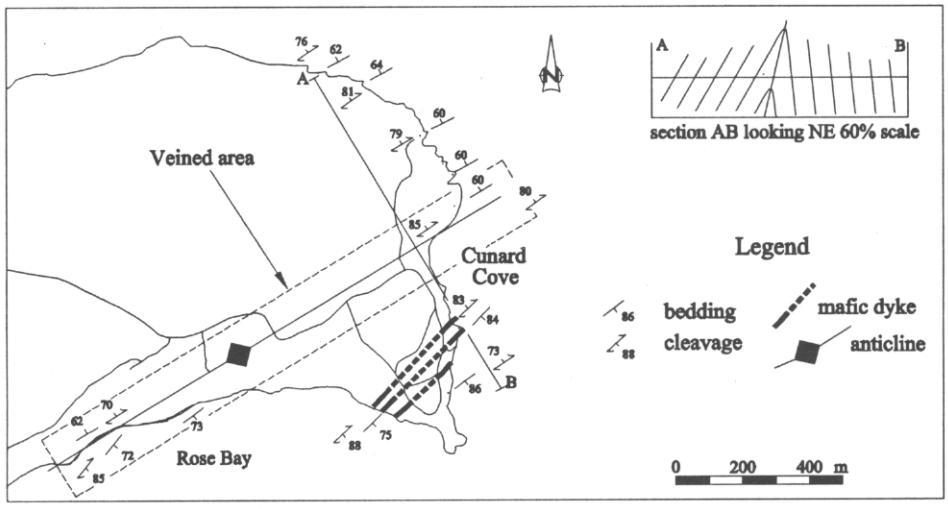


Figure 2. Geology map of the Ovens area, Lunenburg County.

Veins in the Meguma Group, Southwestern Nova Scotia

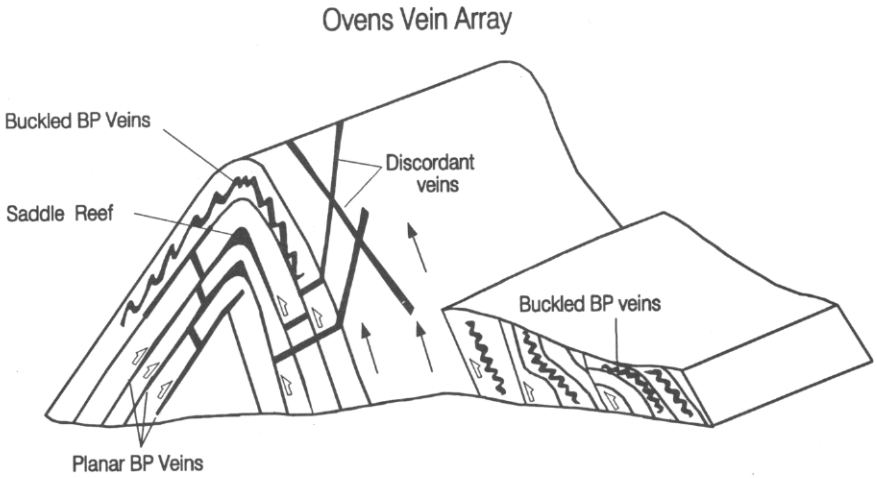


Figure 3. Block diagram of the Ovens Anticline showing the principal types of quartz veins. BP = bedding-parallel.

ometry, but show no evidence of buckling. **Saddle reef veins** occur at the hinge of the Ovens Anticline. We didn't see any gold in the Ovens saddle reef; however, saddle reef deposits have been mined elsewhere in the Meguma Group (e.g. Dufferin Gold District). **Bedding-discordant veins** are widespread throughout the hinge zone of the Ovens Anticline. Both gold and scheelite occur in these veins. Discordant veins truncate the buckled bedding-parallel veins, but may either truncate or be truncated by the planar bedding-parallel veins, indicating contemporaneous emplacement late in the fold history.

Exposure of the Ovens Anticline offers a fine view of the relationship between structure and vein formation. Quartz veins at the Ovens: (1) are localized in the hinge zone of the Ovens Anticline; (2) were emplaced at roughly the same time, late in the fold history; and (3) can be characterized by a model of flexural-slip folding (Fig. 4).

Flexural slip refers to movement between rock layers (slip) along bedding-concordant surfaces during the development of folds. This folding mechanism normally occurs under sub-metamorphic or low-grade metamorphic conditions. All movement surfaces were potential conduits for vein-forming fluids and could also develop into sites of mineral deposition, resulting in the formation of gold-bearing quartz veins.

Anticlines acted as structural traps for mineralizing fluids, as shown by the abundant veins in the hinge zone of the Ovens Anticline. Saddle reef veins, planar bedding-parallel veins, and bedding-discordant veins were all emplaced during flexural-slip folding. The buckled bedding-parallel veins are not concentrated in the hinge zone of the anticline, they extend throughout the fold. Planar bedding-parallel and bedding-discordant veins are the most abundant veins in the hinge zone of the Ovens Anticline. They are also hosts for the majority of observed gold sites.

Acknowledgment: All the technical details in this article, including the illustrations, come from Rick Horne (personal communication).

Doug MacDonald

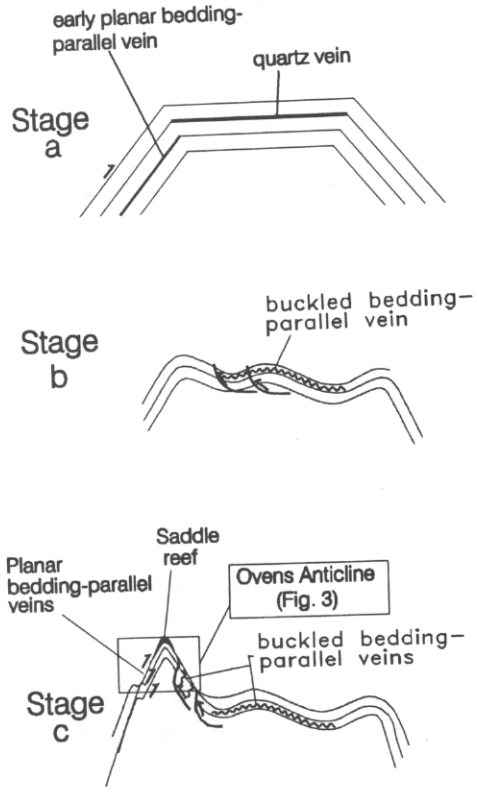


Figure 4. Simplified model for the structural development of the Ovens Anticline as a result of flexural-slip folding.

Stage a: Early box folds result from the multi-layered character of sandstone and slate beds in the Meguma Group.

Stage b: Shortening in the flat top of the box fold results in buckling of existing bedding-parallel veins. Thrust faults develop, causing detachment of layers.

Stage c: Continued crustal shortening causes thrusting of the flat top of the box fold, accompanied by development of planar bedding-parallel veins along flexural-slip surfaces and saddle reef veins at the hinge of the fold. The area surrounded by the box in Stage c represents the present-day exposure of the Ovens Anticline (Fig. 3).

Prospector Training Courses

I am pleased to report that the two Basic Prospecting courses offered in the fall were well attended. Fourteen students completed the course in Halifax, taught by Craig Miller, and an equal number completed the course in Port Hawkesbury, taught by Lyndon Jensen. The new prospectors have all received their certificates and have been issued Prospector Identification Cards.

These training courses are part of the Prospectors Assistance Program (see article on p. 1). The cost to each participant is $100.00 plus HST. This student's fee represents 50% of the total cost for the course. The remaining 50% comes from the Prospectors Assistance Program. Student contributions enable the department to offer more courses. Reports back from students indicate complete satisfaction with the course and its associated cost.

Course Training Manual

The new Prospectors Assistance Program will be able to address the need for a student's manual for the prospecting courses. A manual is being written this year and will be printed next fiscal year. The manual will cover all the topics discussed in the course and will include student exercises in each chapter.

Basic and Advanced Prospecting Courses for the Spring

It is proposed that three courses will operate in the spring. An Advanced Prospecting Course will be given in the Halifax Regional Municipality as well as one Basic Prospecting Course. Another basic course will be offered outside of the Halifax area, either in Parrsboro or Bridgewater. If you would prefer one or the other area, let me know and I'll schedule the course for the area with the most demand. Simply phone 424-2523, fax 424-7735, or e-mail granthrg@gov.ns.ca.

Robert Grantham

October-December Open Assessment Reports

Report No.	Claim Ref. Map	Licensee
93-063	021H/03D	Pulsifer, O B
	021H/06A	
	021H/07B	
93-064	021A/07C	Burrill, H C
93-065	011D/11D	Williams, E S
93-066	011E/09D	Van Oirschot, M L
93-067	011D/15B	Ladouceur, J D
93-068	020O/16D	Goodwin, E M
94-085	011F/11C	MacLeod, C
	011F/11D	
	011F/14A	
	011F/14B	
	011F/14C	
	011F/14D	
	011F/16D	
94-086	021A/15D	Felderhof, G W
	021H/02A	
94-087	011E/08C	Shaw, W G
94-088	021B/01A	Boudreau, R
	021B/01B	
	021B/01D	
94-089	011D/15C	Thomson, A C
94-090	011K/10B	Thomson, A C
94-091	011E/08C	McNulty, K
	011E/08D	
	011F/05A	
	011F/06B	
94-092	011F/03C	Smeltzer, D
	011F/05A	
	011F/06A	
	011F/06B	
94-093	011E/02D	MacKenzie, B C
94-094	011D/12D	MacIsaac, W B
	011F/11B	
	011F/11C	
	011K/01D	
	020O/16A	
	021A/02A	
	021A/07A	
	021A/07D	
	021A/08B	
	021A/08C	
	021A/12A	
	021A/12B	
	021A/12C	
	021A/12D	
94-095	011E/04A	Horne, E N
94-096	011F/05A	Hill, J
	011F/05D	
94-097	011K/07B	Bain, D
94-098	021H/01C	Booth, I
	021H/02B	
	021H/02C	

October-December Open Assessment Reports

(continued from p. 6)

Report No.	Claim Ref. Map	Licensee
94-098	021H/02D	Booth, I
	021H/07B	
	021H/08B	
94-099	011E/08C	Harrigan Ventures Limited
94-100	021A/02D	O'Brien, J
	021A/08A	
	021A/08B	
94-101	011D/14B	Collett, T
94-102	011D/11C	Henneberry, M
94-103	011E/09A	Mazerolle, G J
	011E/09B	
94-104	011E/16A	MacInnis, D X
95-083	011E/01A	Grant, S
95-084	011D/14A	Ellsin Resources Limited
95-085	020P/15C	Little Lake Gold Mines Limited
	021A/02B	
95-086	011F/09C	Deak Resources Corporation
	011F/16B	
95-087	011F/04D	MacMillan, J H
95-088	021H/09A	Springhill Coal Mines Limited
	021H/09D	
95-089	011F/09C	Deak Resources Corporation
	011F/16B	
95-090	011F/12B	Van Oirschot, M L
95-092	011D/11C	Langille, B H
95-093	011D/13D	MacDonald, M
95-096	011D/14D	Shupe, D
95-097	011F/14C	Kelly Rock Limited
	011F/14D	
95-098	011E/07D	Hudgins, A D
95-099	011E/07D	Hudgins, A D
95-100	021A/04B	James Henry and Associates
95-101	011K/08B	Barrett, A M
95-102	011D/14C	DeBay, A
95-103	011E/01A	Coughlan, T F
	011E/01D	
	011F/04B	
	011F/04C	
95-105	011K/07D	Mazerolle, G J
	011K/10A	
95-106	011K/10B	Kelley, D G
95-107	011E/07D	Hudgins, A D
95-109	011E/01A	Coughlan, T F
	011E/01D	
95-111	011K/10B	Mitz, L R
96-007	011E/07D	Hudgins, A D
96-029	011E/07D	Black, D L
96-030	011E/07D	Hudgins, A D

Susan Saunders and Norman Lyttle

Minerals and Land Access in Nova Scotia

Land access is a necessity to Canada's mining industry and its ability to find new deposits. Over the last 20 years Canada has experienced a trend of decreasing access to land and security of mineral rights tenure. This is mainly due to three factors: an increasing demand for protecting wilderness areas and rural landscapes, an urgency for settling aboriginal land claims, and the persistent growth of urban development.

Nova Scotia's land ownership pattern is probably the most complex of all the mineral-producing regions in Canada. The land base comprises an area of 55 286 km^2. This consists of approximately 40 000 km^2 of private land, about 73% of the land base. The remaining 15 000 km^2 (27%) is Crown land. The combination of a high percentage of private land and a relatively high population density produces a strong probability that any new mineral-based undertaking will affect someone's property or land protected by recreation or ecological interests.

Crown land is subject to shifting political directions. A dramatic example of changing government policy in Crown land use occurred in 1993 when Nova Scotia declared a moratorium on 31 candidate protected areas. Some of these areas are known to have significant mineral potential. By withdrawing access to more than 2870 km^2, the amount of protected Crown land increased from 12% to 31%. Approximately 70% of our Crown lands remain generally accessible to the mineral industry. When all land designations preventing access to the mineral industry are combined they amount to 4730 km^2 or about 9% of the province. This means that 91% of Nova Scotia remains generally accessible to the mineral industry (see figure on page 8).

The land access issue is not merely a question of how much land is available. Since land, resources and the environment transcend ownership boundaries we should ensure that all types of land-use planning integrate our economic and environmental ob-

Land Access continued on page 8

The Prospector's Stake

Beginning with this issue of the *Nova Scotia Minerals Update* we are introducing a new feature column about prospecting and prospectors. The idea behind this column is simple. We want to give prospectors more recognition; after all, prospectors are the 'grass roots' of exploration and the mineral industry.

What topics will be covered in this column? Look for short, informative biographies about Nova Scotia prospectors and information about programs that affect prospectors. Just as important will be short descriptions of techniques and procedures that you may wish to use in your work. We may even have guest columnists from time to time. Occasionally you will see photographs of events or people. Be sure to read about the Prospectors Assistance Program in this issue.

In this first column I want to look at the words 'prospector' and 'prospect'. Most dictionaries define a prospector as a person who searches or explores for some form of natural deposit, such as gold or oil.

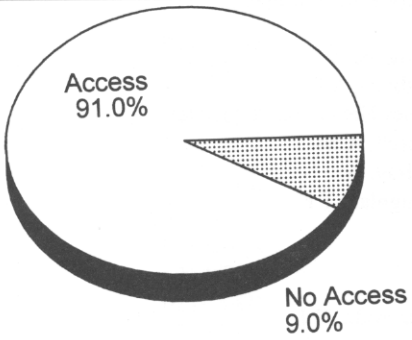
More informative is the definition of prospect: something that we try to find. The word is derived from the Latin *prospectus* (view or prospect) and also from the French *pro* (forward) + *specere* (to look). In Webster's and the Oxford dictionaries, prospect is an "extensive view", a "mental consideration or picture", and an "extensive view of the landscape". Successful prospectors typically have a forward-looking philosophy that gives them a very optimistic outlook. But more important than optimism is the ability of these successful people to project a mental picture of what might be. As these prospectors work their ground they never seem to be surprised at what they find; it's as if they knew what was there. Perhaps these prospectors work with both intuition and knowledge to produce their measure of success.

In prospecting what is important is the positive, forward-looking perspective about finding mineral deposits. This outlook ensures a greater measure of success. And when prospectors are successful, the entire mineral industry benefits.

Howard Donohoe

Land Access continued from page 7

jectives. DNR is now engaged in a comprehensive land-use planning process known as integrated resource management (IRM) for all provincial Crown land. This process will develop consistent resource strategies and plans, based on the common principles of environmental responsibility, inclusiveness, biodiversity, multiple use, optimization of social and economic benefits of resource use, and sustainability. Mineral resources are part of the resource mix to be considered in IRM, ensuring greater certainty for land access and security of mineral rights tenure.



Land access to mineral resources in Nova Scotia.

Although the IRM process is limited to Crown land we must ensure that geoscience information is considered in all land-use plans and decisions. We must convey the message, especially in rural Nova Scotia, that mineral-based activity plays a significant and responsible role in community economic development and that geoscience information is fundamental to planning the protection of our environment and infrastructure.

David Hopper

Special Notes

Loss of a Great Prospector
With sadness we report the death of an ardent prospector, entrepreneur, stalwart miner and friend. Edgar Horne, owner of the "Double Nugget" property in Renfrew, passed away at home on January 22, 1998, after a battle with cancer. Edgar will be remembered for his great enthusiasm, knowledge, and willingness to share what he knew. He was always ready to talk about, show, work on, or even just think about gold and its capturing beauty. He will be deeply missed.

Rob Naylor New Regional Geologist
Rob Naylor, formerly a Project Geologist in the Mineral Resource Evaluation Section, has been named as the new Regional Geologist in the Geological Mapping and Geochemistry Section. Rob succeeds Bob Ryan, who took over management of the Mineral Resource Evaluation Section in August 1997 (see *Nova Scotia Minerals Update*, vol. 14).

Dates to Remember

February 6 and 7, 1998
Atlantic Geoscience Society Annual Meeting, Old Orchard Inn, Wolfville, Nova Scotia. For more information call Rob Raeside at the Acadia University Department of Geology (902) 542-2201.

March 8 to 11, 1998
Prospectors and Developers Association of Canada, Royal York Hotel and Metro Toronto Convention Centre, Toronto, Ontario. For information call the PDAC at (416) 362-1969.

May 11 to 17, 1998
Nova Scotia and National Mining Week '98. For information call the Chamber of Mineral Resources of Nova Scotia at (902) 798-0187 or the Nova Scotia Department of Natural Resources at (902) 424-8633.