

MINERAL OCCURRENCE DATA SYSTEM

G. Stapleton, J.L. Smith and C.F. O'Driscoll
Mineral Deposits Section

ABSTRACT

The Mineral Occurrence Data System (MODS) is a three-part database consisting of a manual Mineral Inventory File, mineral occurrence maps on geological bases and a computerized Mineral Inventory Database. The MODS contains information on about 5000 mineral occurrences and is designed to offer fast and easy access to information on the province's mineral resources.

INTRODUCTION

The Mineral Occurrence Data System (O'Driscoll *et al.*, 1991) consists of a manual Mineral Inventory File, mineral occurrence maps on geological bases and a computerized database (Figure 1). The project is designed to provide an efficient information service of all the mineral occurrences in Newfoundland and Labrador.

The MODS information is compiled mainly from a systematic search of mineral-exploration company assessment reports. Other sources of information include publications by the Geological Survey of Newfoundland and Labrador, the Geological Survey of Canada, published news items, press releases, publications in geological and mining journals, and personal communications from mining company and government personnel.

MANUAL MINERAL INVENTORY FILE

The manual Mineral Inventory File is part of the National Mineral Inventory and consists of mineral occurrence reports that summarize all data on known mineral occurrences in the province. It presently contains about 5000 reports that include coverage for the Island of Newfoundland (Figure 2) and selected areas in Labrador (Figure 3).

The Mineral Inventory File is continually being updated. This file was started in 1978, and since then, new geological mapping and exploration have been carried out and many new occurrences have been discovered.

MINERAL OCCURRENCE MAPS

Mineral occurrence maps with updated geological bases have been published at 1:250 000 scale. In addition, selected

areas have been published at 1:50 000 and 1:100 000 scales. An industrial minerals map for the Island of Newfoundland, at 1:100 000 scale on a coloured geological base, is also available. The maps provide the location, minerals present, and status of each occurrence and are available from the Geoscience Publications and Information Section, upon request.

COMPUTERIZED MINERAL INVENTORY DATABASE

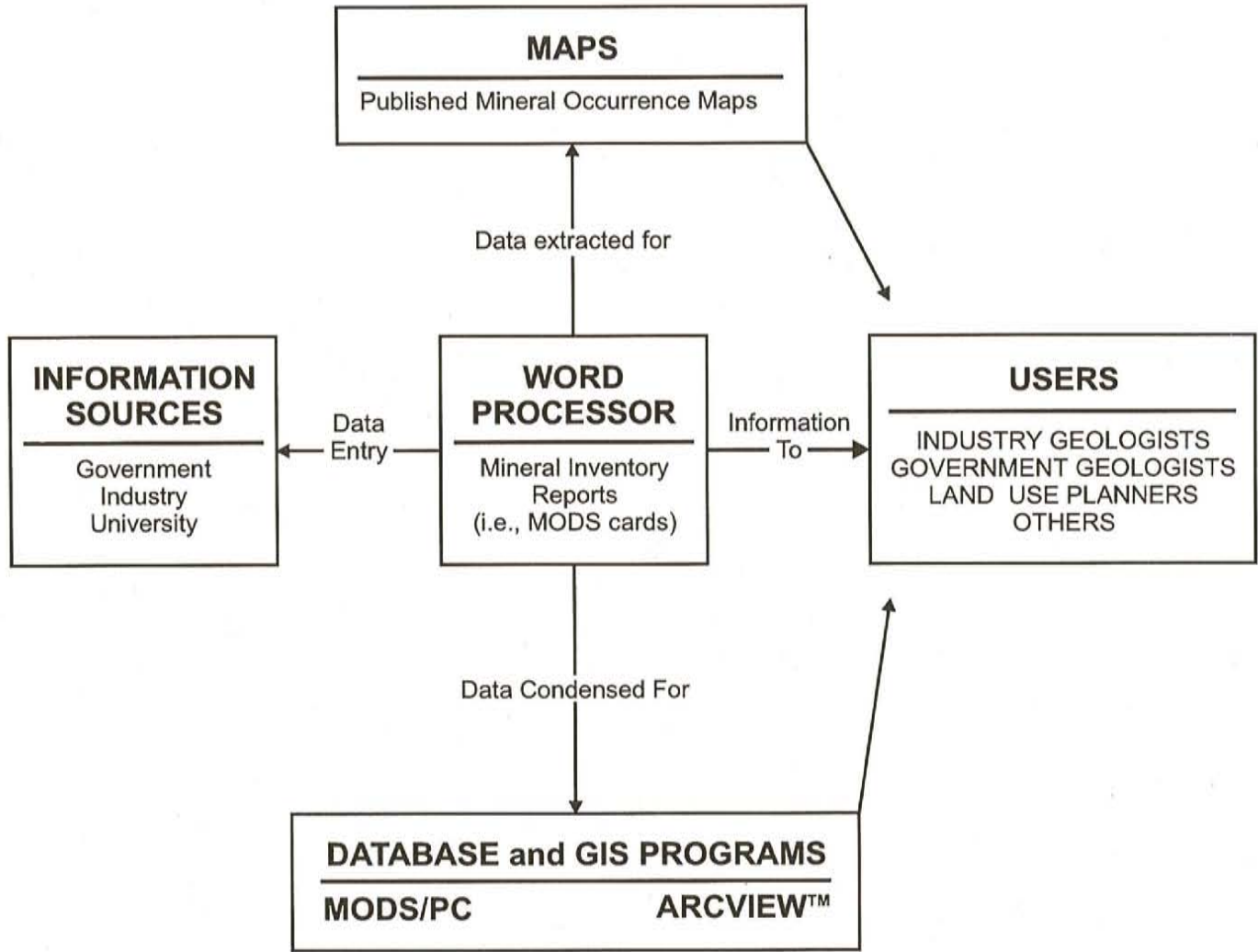
Since 1978, a computerized Mineral Inventory Database, which parallels the manual file and contains information selectively extracted from it, has been developed and maintained. Over the years, the computerized database and the database software have evolved and changed as a result of technological advances and client demand.

GRASP

The MODS originally used the mainframe-based Geological Retrieval and Synopsis Program (GRASP), which was developed by the United States Geological Survey (Bowen and Botbol, 1975) as its database management software. Although GRASP is a powerful program that allows complex searches to be performed, it is not user friendly or available for microcomputers. Therefore, clients had to visit the Geological Survey office to use it; hence GRASP is no longer used by the MODS for these reasons.

MODS/PC

As a result of the proliferation of PC's and the demand for easier access to MODS information, a microcomputer-based MODS, called MODS/PC, was developed and released in 1991 (Stapleton and Parsons, 1991). It is written in the



The three components of the Mineral Occurrence Data System (MODS) are mineral inventory reports, mineral occurrence maps and the computerized database. These can be used either individually or collectively.

A user may study the mineral occurrence map of an area to identify occurrences of interest and can then peruse the mineral inventory reports to find detailed information on one or more specific mineral occurrence(s).

Occasionally a user may want less detailed information on all occurrences of a particular type, for example, vein type, located over a large geographic area. Particular information can be selected from the database and saved on disk, displayed on screen or printed out in a report.

Mineral-exploration company personnel or individuals interested in claim staking will first want to assess an area's mineral potential before acquiring a land position. This can be achieved by using a geographic information system to view MODS data in combination with other data sets such as lake sediment geochemistry, aeromagnetism or land tenure.

Figure 1. Organization and operation of the Mineral Occurrence Data System.

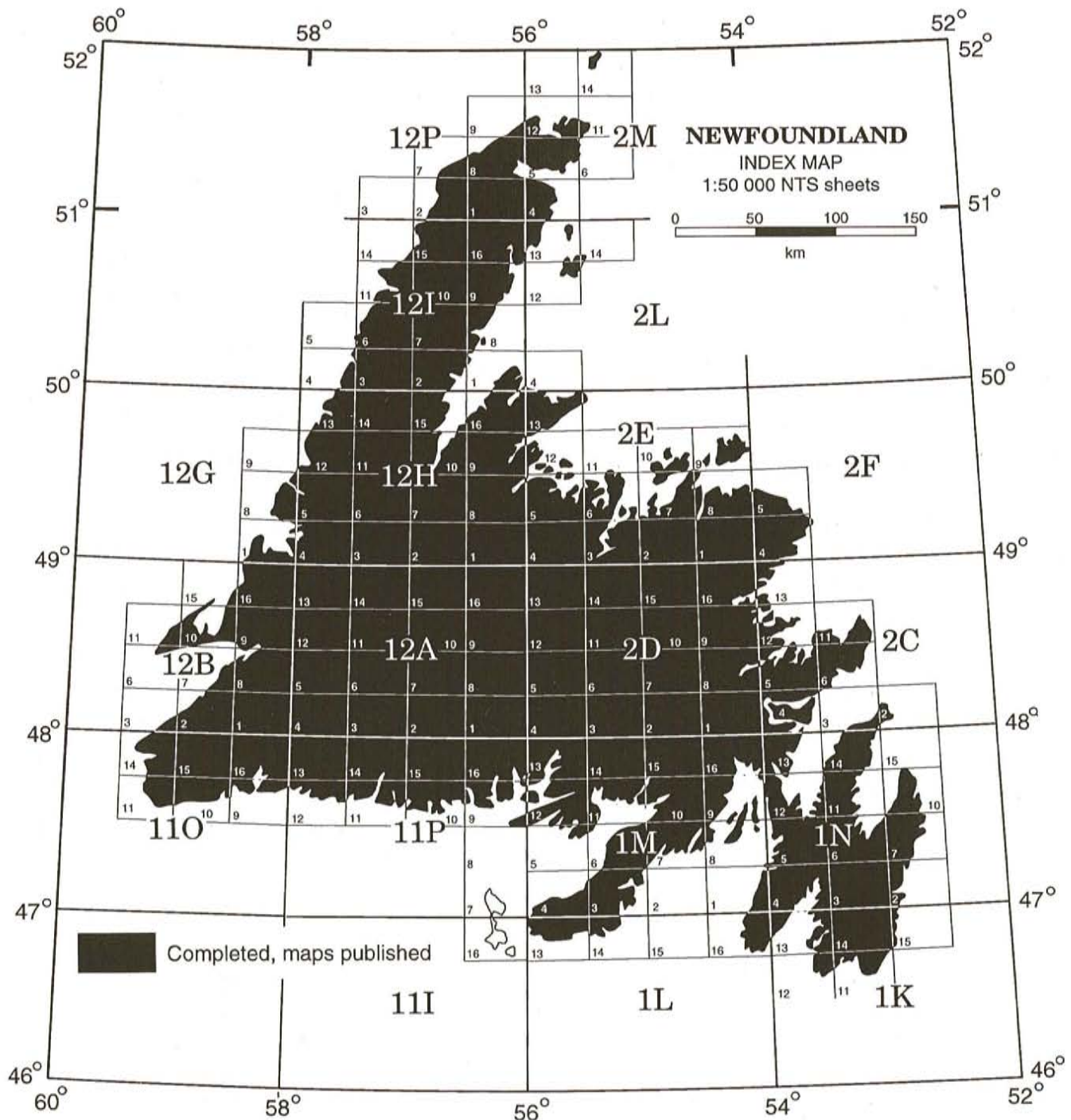


Figure 2. Index map for Mineral Occurrence Data System project, insular Newfoundland.

R:Base Database language (V2.11) and compiles using the R:Base compiler (V1.02). MODS/PC is a menu driven, user friendly, "turn-key" system that is designed to run on an IBM compatible microcomputer with a 286 or better, processor. Since its release in 1991 MODS/PC has been very well

received. Presently, there are approximately 80 companies and individuals on the subscribers list.

Since the release of MODS data on CD-ROM (*see below*), with the Geochemical Atlas of Newfoundland,

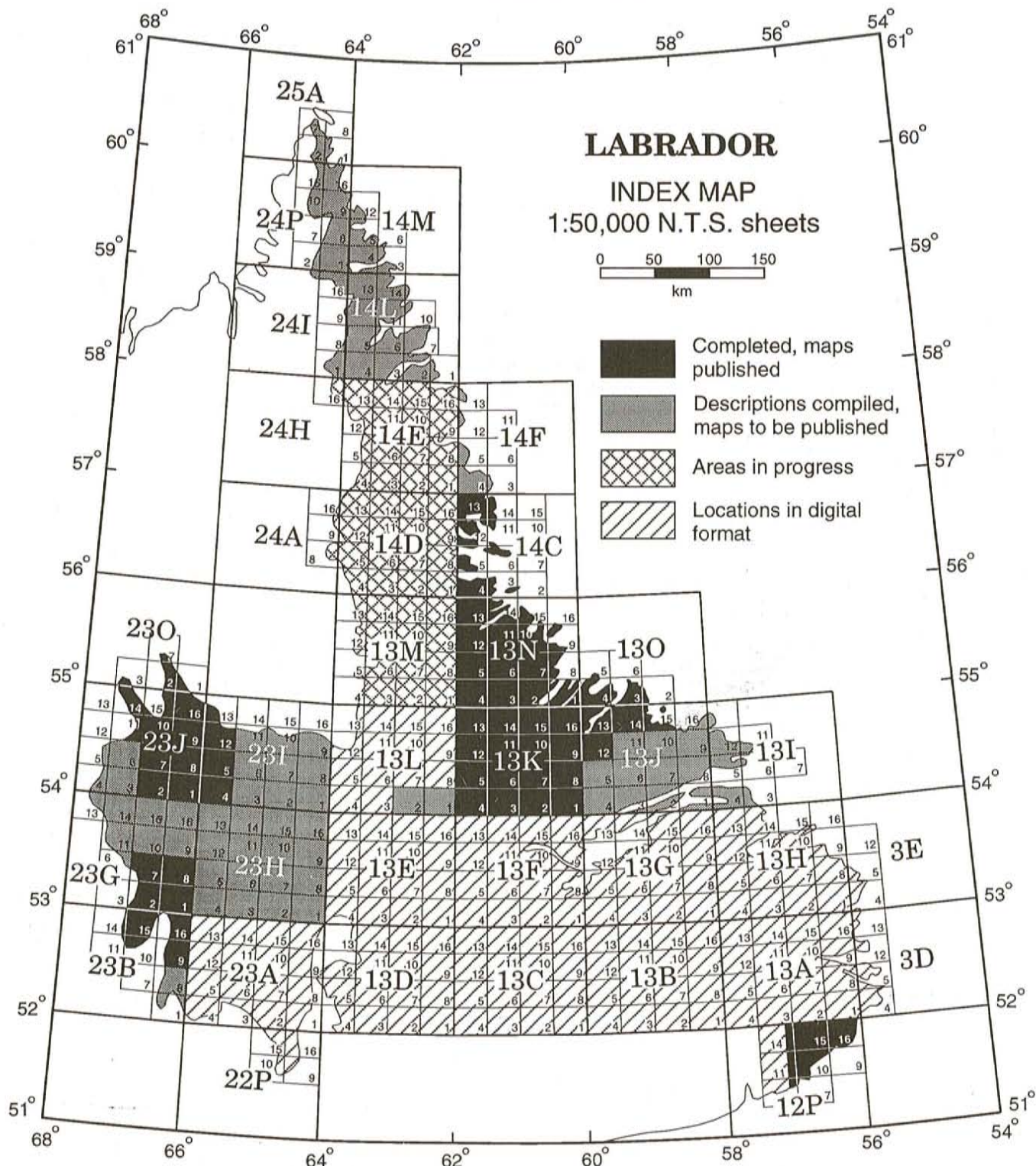


Figure 3. Index map for Mineral Occurrence Data System project, Labrador.

interest in MODS/PC has declined. Clients prefer to view mineral deposit data using an integrated approach that can be better achieved using GIS programs such as ArcView or Arc-Explorer, etc. Therefore, efforts will be concentrated in this area and not on the release of updated versions of MODS/PC.

MODS FOR GIS

Selected fields from the MODS/PC record (Table 1) are available on CD-ROM with the Geochemical Atlas of Newfoundland (Davenport *et al.*, 1994). The atlas operates as

Table 1. Fields and field descriptions from MODS for ArcView™ record

dep name	Usual name for occurrence																		
alt name	Alternate name for occurrence																		
nmino	National mineral inventory number																		
major com	Major commodity present																		
mod type	Symbol for major commodity present																		
minor com	Secondary commodities present																		
dep type	Deposit type; coded genetic classification of deposit																		
dep char	Deposit description																		
status	Numeric code indicating amount of work done and hence the amount of information available on a deposit <ol style="list-style-type: none"> 1. Producer - Commodity is extracted for sale 2. Developed Prospect - Reserves or demonstrated resources of the commodity can be calculated but the commodity has not yet been produced (i.e., three dimensional data plus grade). 3. Past Producer Dormant - The commodity is no longer produced, although there are known reserves or demonstrated resources 4. Past Producer Exhausted - The commodity is no longer produced and there are no longer reserves or demonstrated resources 5. Prospect - Two dimensional data and grade are available but not enough data to calculate reserves 6. Showing - Mineralization exists in outcrop with little information known about its spatial extent. Assay data exists. 7. Indication - An indication of the existence of the commodity, i.e., field observation, grab sample, assay, etc. 																		
status key	Alpha description of numeric status code as described in status above																		
geology	Code for geological unit in which occurrence lies																		
tect zone	Tectono-stratigraphic zone in which occurrence lies																		
host rock	Rock type(s) associated with deposit																		
str unit	Stratigraphic unit in which occurrence lies																		
rocks	Rock type(s) associated with deposit																		
geolwk	Geological work done? y = yes																		
geophwk	Geophysical work done? y = yes																		
geochw	Geochemical work done? y = yes																		
DDH	Number of drill holes into the deposit																		
trench	Trenching? y = trenching done																		
adit	Adit? y = adit present																		
shaft	Shaft? y = shaft present																		
working	Type of mine workings. This field would have a value for deposits of status 1, 3 or 4 <table style="margin-left: 20px;"> <tbody> <tr> <td>Underground</td> <td>- u</td> </tr> <tr> <td>Open Pit or Quarry</td> <td>- o</td> </tr> <tr> <td>Strip</td> <td>- s</td> </tr> <tr> <td>Placer</td> <td>- p</td> </tr> <tr> <td>Solution/Leaching</td> <td>- l</td> </tr> <tr> <td>Underground and Open Pit</td> <td>- uo</td> </tr> <tr> <td>Underground and Strip</td> <td>- us</td> </tr> <tr> <td>Underground and Placer</td> <td>- up</td> </tr> <tr> <td>Uncertain</td> <td>- un</td> </tr> </tbody> </table>	Underground	- u	Open Pit or Quarry	- o	Strip	- s	Placer	- p	Solution/Leaching	- l	Underground and Open Pit	- uo	Underground and Strip	- us	Underground and Placer	- up	Uncertain	- un
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Underground and Placer	- up																		
Uncertain	- un																		
size	The workings size (size) field gives an indication of the size of the mine and would only have a value for deposits of status 1, 3 or 4. It is a single digit alpha field that has three (3) possible values, s - small, m - medium and l - large. This field is divided into two (2) categories. <ol style="list-style-type: none"> 1) Underground - Size is based on total lateral advances out from a minimum 18.30 m adit or shaft. <table style="margin-left: 20px;"> <tbody> <tr> <td>s =</td> <td>small, < 1500 m</td> </tr> <tr> <td>m =</td> <td>medium, 1500 m - 15 000 m</td> </tr> <tr> <td>l =</td> <td>large, > 15 000 m</td> </tr> </tbody> </table> 2) Open Pit/Strip/Placer - Size is based on amount of rock removed. Minimum 300 cu. m. <table style="margin-left: 20px;"> <tbody> <tr> <td>s =</td> <td>small, <30 000 cu. m</td> </tr> <tr> <td>m =</td> <td>medium, 30 000 - 150 000 cu. m</td> </tr> <tr> <td>l =</td> <td>large, >150 000 cu. m</td> </tr> </tbody> </table> 	s =	small, < 1500 m	m =	medium, 1500 m - 15 000 m	l =	large, > 15 000 m	s =	small, <30 000 cu. m	m =	medium, 30 000 - 150 000 cu. m	l =	large, >150 000 cu. m						
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prores	Statement of deposits production and reserve figures																		
utmzone	UTM Zone in which the occurrence falls																		
utm east	Easting coordinate																		
utm north	Northing coordinate																		
nts	NTS area																		

a "turnkey" system on a microcomputer and uses ArcView™ as its viewing system. Along with geochemical and mineral deposit data, the atlas provides access to many other geoscientific databases. This system enables MODS users to view abbreviated mineral deposit data in a broad geoscientific context.

WORK IN PROGRESS

MODS REPORTS TO BE MADE AVAILABLE ON CD-ROM

The MODS project is presently evaluating ways to make the manual Mineral Inventory File more accessible to our clients. The reports, which are in WordPerfect™ format, have been copied from 3½ inch diskettes to an active storage medium on the Geological Survey's computer network. They will be released either on CD-ROM as a fully searchable infobase using the Yukon Minfile model, or on CD-ROM with the digital Geochemical Atlas of Newfoundland, where the MODS for ArcView™ data will be used as an index to the more detailed mineral inventory reports. Once a user has identified a mineral occurrence of interest using MODS for ArcView, the user would be able to jump out to the more detailed mineral inventory report for additional information.

LABRADOR

During the past year, the MODS project continued to document new mineral discoveries in Labrador that resulted from the recent intense exploration activity sparked by the discovery of world-class nickel, copper and cobalt reserves at Voisey's Bay. Efforts were concentrated on NTS map areas 14C, 14D, 14E and 14F, as these areas are the focus of a joint digital compilation project between the Geological Survey of Newfoundland and Labrador and the Geological Survey of Canada. The MODS project is responsible for compiling the mineral deposit database for this project.

In addition, mineral occurrences in Labrador that were documented in "Mineral Occurrence Tables Labrador" (Douglas, 1976), but not included in the computerized mineral inventory, were added to the digital database. This data was added at the request of stakeholders involved in land claims negotiations, and, because of the urgent need for occurrence locations, only minimal information was included. This project will be revisited in order to complete the data fields in each record.

INSULAR NEWFOUNDLAND

This past year work, in insular Newfoundland concentrated on documenting gold discoveries on the Baie Verte Peninsula (NTS map area 12H/16). This data will be integrated into the MODS database during the next few months. New geological maps are being digitized and will form the base for updated mineral occurrence maps to be produced in

digital form. The first update will be Sandy Lake (NTS 12H) map area.

MODS USERS

The MODS is used primarily by mineral-exploration company personnel and consultants, but, it is also used by independent prospectors, geotechnical consultants, personnel and students of academic organizations and the general public.

The database is used daily by government geologists in land-use planning. Advice is given to various departments of government in establishing wilderness areas, hydro developments, provincial and national parks, forest management plans and any other developments that may conflict with future mineral exploration and development. In addition, municipal councils and the provincial Department of Municipal Affairs are advised of the location, extent, and nature of mineral deposits in specific areas, so that new housing and commercial developments, parks, water reservoirs and sewage-disposal systems can be located, where possible, in areas of low-mineral potential.

Copies of the file are made available to the various agencies of the federal government such as the Mineral Policy Sector and the Geological Survey of Canada.

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