



Fig. 1 - Location of divisional* Economic Geology Projects reported here. Numbers on map refer to projects listed below.

Project No.	Area/Short Title	Project Leader(s)
<u>Uranium Metallogenic Studies:</u>		
10.	Collins Bay B Zone, I Geology	T.I.I. Sibbald
11.	Cluff Lake Area	C.T. Harper
12.	Donaldson Lake Area	D. Thomas
<u>Gold Metallogenic Studies:</u>		
13.	Waddy Lake and Region	W.G.Q. Johnston
14.	Phantom Lake-Schist Lake Area	J.G. Pearson
<u>Base Metal Studies:**</u>		
15.	Flin Flon Metals Project, Annabel Lake Area	W. Gaskarth and G.R. Parslow

*Economic geology projects by other institutions are not included in this list.

**Contracted out to the University of Regina.

ECONOMIC GEOLOGY INVESTIGATIONS

Introduction by T.I.I. Sibbald

The Economic Geology Division undertook six field projects (Fig. 1), of which five involved staff members on a part or full-time basis and one was contracted to the University of Regina.

Uranium Metallogenesis

Uranium metallogenic studies were carried out at Cluff Lake and in the Rabbit Lake and Beaverlodge areas. The Cluff Lake study (Project 11) involved: 1) logging and systematic sampling of N zone drill core for trace metal and whole rock geochemistry, 2) examination and geochemical sampling of vein structures exposed in the exploration decline of the OP deposit, and 3) bedrock sampling of the crystallines in the core of the Carswell Structure for Rb-Sr age dating. Also reported are results of a lithogeochemical study of the F zone conducted in 1980-81.

A drill hole cross-section of the Collins Bay B zone was documented (Project 10) in order to provide a geological base for a clay mineral investigation by the Saskatchewan Research Council (Hoeve, this volume). Definition of the characteristics of alteration clay mineral haloes surrounding unconformity-type uranium deposits may prove a significant aid to exploration of the Athabasca Basin.

In the Uranium City area, detailed geological mapping by the resident geologist (Project 12) was initiated around Donaldson Lake with the objective of evaluating and refining existing geological studies with respect to uranium metallogenesis.

Gold Metallogenesis

Two gold projects were conducted. One project in the La Ronge Domain (Project 13) involved detailed mapping and lithogeochemical sampling of the area surrounding the Komis prospect, west of Waddy Lake. In addition, because of an apparent spatial relationship between gold occurrences and the margins of certain "granitic" intrusives, regional bedrock sampling was undertaken along profiles across intrusion margins. Data presently available suggest that gold enrichments occur in the marginal zones of such intrusions and/or in the immediately adjacent host rocks in regions where gold showings are known to occur. As such enrichments are easily detectable, they

may provide a simple criterion for delimiting favourable exploration ground.

The second gold project (Project 14) was carried out around Phantom and Schist Lakes, south of Flin Flon, by the Creighton resident geologist. An area encompassing the old Phantom Lake and MacMillan gold mines and several other occurrences was mapped in detail and representative bedrock types and mineralized zones sampled. Two types of gold occurrence are recognized: 1) gold quartz veins in volcanic rocks (e.g. MacMillan Mine) and 2) gold in pyritic shear zones in granitic rocks (e.g. Phantom Lake Mine).

Base Metal Studies

Under the Flin Flon Base Metals Project (Project 15), contracted to the University of Regina, bedrock mapping at 1:50,000 scale and geochemical sampling were carried out in the Annabel Lake area northwest of Flin Flon, principally in two metavolcanic belts flanking the Annabel Lake Pluton. The 1080 bedrock samples collected will be analysed for major and selected trace elements to aid definition of the composition, evolution and depositional environment of the volcanic succession, and allow geochemical comparison with the previously studied, less metamorphosed, 'economically productive' volcanics in the area east of Amisk Lake.

Mineralized Core Collection

An aggressive program of core collection was carried out during the year with the objective of establishing a record of northern Saskatchewan's mineral deposits and other important geological features, such as stratigraphic core from the Athabasca Basin, at the La Ronge Precambrian Core Laboratory. The value of such a collection has been demonstrated by the enthusiastic response of the mineral industry to uranium deposit core displays, recently held in conjunction with the Geological Association of Canada, Annual Meeting in Calgary and the Canadian Institute of Mining and Metallurgy/Society of Economic Geologists, Uranium Symposium, in Saskatoon. The cooperation of the numerous companies who submitted core to the collection is gratefully acknowledged.

Mineral Deposits Index

Work on the Saskatchewan Mineral Deposits Index manual and computer file continued and both files are now essentially complete, although subject to continuous updating.

Resident Geologists Offices

The Economic Geology Division, through the resident geologists in La Ronge, Creighton and

Uranium City, and the staff of the Regina office, services the mining industry by providing up-to-date information on exploration and mining opportunities and activities in northern Saskatchewan. Numerous meetings with industry representatives were held during the year and several field visits undertaken. The resident geologist offices continue to maintain files of current mineral claim maps, airphotos and assessment work submissions for their respective districts, and to sell geological maps and reports.