Canada
Department of Energy, Mines and Resources
Geological Survey of Canada

Parts of 104 E, L and 114 H, I

Drift-covered areas.....
Geological contact.....
Fault.....

Geology generalized from geochemical maps by A.D. Bogatffow from aired Riser (1966) and Hunt Riser (1968) by R.G. Morris (G.S.C. Open File 274, 1974), and Eagle River (1963) manuscript unpublished map by D.C. Morris

Geological cartography by the Geological Survey of Canada

Base-map assembled by the Geological Survey of Canada from maps published at the same scale by the Surveys and Mapping Branch to 1956, 1959

Mean magnetic declination 1971, 30°53' E' fast, decreasing 2.4' annually. Readings vary from 30°31.8' in the SE corner to 30°31.3' in the NW corner of the map-area

Elevations in feet above mean sea-level

GEOCHEMICAL SYMBOLS AND DATA PRESENTATION

The absolute background and anomalous concentrations, and the contrast between them will vary regionally depending on factors such as the physiography, geology, the sample media and the chemistry of the elements determined.

Physiographical regimes within the survey area include the Mackenzie, Ogilvie and Richardson Mountains, and the Eagle Plains and Bonnet Plume basin. Most of the sediments in the mountainous regions are derived from the underlying rocks by mechanical breakdown of the underlying rock and has been transported as particulates during the heavy spring run-off. Stream sediments range in size from fine silt to boulders with little chemical alteration of the parent rock. Sediments in the topographic basins of Eagle and Bonnet Plume basins are commonly discontinuous, fine at the selectors, and deposits organic-rich sediment. Under these conditions, organic matter may be expected to play a significant role in the transport and deposition of some elements.

Cu, Zn, Co, Ni, Mo, etc.) and may therefore produce significant anomalies. It is important that the significance of the various anomalies be borne in mind in the data listing be considered when examining the metal content of any specific site.

The geology of the survey area is represented by sedimentary, volcanic and intrusive rocks ranging in age from Archean to Recent. Sedimentary rocks underlie at least every period representative. To date, it has been reported to occur in breccias associated with the Proterozoic sedimentary and volcanic rocks of the Hermeute Formation. Mineralization of economic significance is not known to occur in the area. The potential in the survey area include the following: the Mesozoic alkaline stocks and batholiths; the Paleozoic shales as a source of low grade and high tonnage Ni; the Mesozoic and Cenozoic sedimentary basins such as the Eagle Plains and Bonnet Plume basins; and structures such as faults and unconformities which may serve as favorable hosts for epigenetic deposits.

Because of the mechanical derivation of stream sediments from mineralized terrain, the geochemistry is strongly influenced by the chemistry of the underlying rocks. For example, the Cambrian, Ordovician and Silurian limestones, the Devonian and Paleozoic and Mesozoic rocks, have high background concentrations of Ca and most other elements determined which is reflected in the geochemistry of the stream sediments. Similarly, the Proterozoic and Archean rocks are relatively low in terms of the background concentrations affecting the geochemistry of the surficial environment.

The element associations expected for particular types of U and base metal mineralization should be considered when evaluating geochemical anomalous stream sediments. For example, Au, Cu, Co and to a lesser extent, Mo, Y, and W are economically important elements commonly associated with U. Pb, Zn and Ag, which would be expected to be associated with primary hydrothermal base metal sulphide plutons. Furthermore, element associations in stream sediments and waters will be useful in delineating the favourable lithologies for U and base metal. In the absence of lithologic(s), Anomalous geochemical trends within these regional patterns should then be evaluated for possible mineralization on the basis of not only the absolute concentrations but also the element associations.

The concentration of an element at a sample site is graphically represented as one of 15 symbols. If a sample was collected but there is no data available a dot is plotted. The symbols are arranged so that they first increase in size as the eighth symbol and then increase in blackness to the fifteenth. The two small crosses at the top of the scale are for the data group containing the detection limit. Where the statistical detection limit, or in the data group containing the detection limit. The data are grouped on a semi-logarithmic scale, i.e. 1,2,5,10,25,50,100 etc. Five Anomalous Zones are shown on the geochemical maps of the Geological Survey of Canada while series of maps constituting the National Geochemical Reconnaissance.

The choice of symbols and the data groups they represent for any specific element is based on the statistical parameters of the data for that element. The following data from one, or more contiguous, open-file sheets covered to careful examination. The eighth symbol is used for the model group as defined by the histogram, this group usually includes the median of the data as defined by the G.S. (50%) point on the cumulative frequency plot. Some, or all, of the remaining 14 symbols are chosen to emphasize the anomalous concentrations.

The raw data symbol maps are only intended to assist the rapid inspection of the data for gross regional features. To fulfil the need for a more specific and quantitative approach to the data, a computer program has been set up to produce sample-by-sample listings. To assist in the appraisal of the data in terms of the geology map bedrock geology, a table of summary statistics for the drainage samples deliberately derived from within each bedrock unit, or broad lithologic unit, is presented below the histogram. In many instances, the table will also illustrate, more clearly than the map, the distribution of anomalous values within a single unit. It will also be observed that within the total data appears to approximate a log-normal distribution the data for individual map or lithologic units appears to approximate a normal distribution. This phenomenon is probably due to the relative lack of detection limit for a large number of samples (e.g. U and F in waters, Ag, Mo and W in sediment). In these situations, the frequency distribution will be positively skewed. Because of the above factors, the use of the mean plus two standard must be exercised when using the table of summary statistics to establish background and anomalous concentration ranges for a given element.

To comprehensively study an area, all available geological, environmental and recorded data should be utilized. The data separation by bedrock type can often be used to advantage in the study of the data and in the final likelihood results based on the most detailed and quick-date knowledge available.

Table of Summary Statistics for Sample Media Underlain by the Different Lithologies

Lithology	No. of Samples	Geometric Mean	Mean	S.D.	C.V.-1
Dolomite	58	4	6	5	94
Limestone	353	3	4	4	105
Argillite	205	10	13	11	84
Shale	69	10	14	17	80
Siltstone	97	11	14	13	92
Siltstone	20	7	10	9	88
Sandstone	112	8	10	10	94
Sandstone	112	8	10	10	94
Conglomerate	50	8	9	5	61
Syenite	17	13	17	18	68
Granite	13	10	12	8	72
Granite	9	10	12	8	72
Undivided Sedimentary Rock	66	5	7	7	96

Data units are in ppm

NATIONAL GEOCHEMICAL RECONNAISSANCE MAP 16-1978
OPEN FILE 420

Resource Geophysics and Geochemistry Division

Geological Survey of Canada, Ottawa

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Sample preparation by Bondar Associates
Chemical analyses by Chemex Labs Ltd.

This map forms one of a series of 65 sheets released under Geological Survey of Canada, Open Files 420, 439, 420. The Open Files consists of data for 13 elements each for stream sediments, percent loss on ignition, 2 elements for stream waters and sample site location

The data are also available in digital form. For further information please contact:

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NATIONAL GEOCHEMICAL RECONNAISSANCE MAP 16-1978

COBALT IN STREAM SEDIMENTS

URANIUM RECONNAISSANCE PROGRAM

Scale 1:250,000

Kilometres 0 5 10 15 Kilometres
Miles 0 5 10

Canada Centre for Mapping Production

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NATIONAL GEOCHEMICAL RECONNAISSANCE MAP 16-1978
OPEN FILE 420
HAMILTON RIVER TERRITORY, 1978
COBALT