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

Parts of 106 E, L and 116 H, I

LEGEND

Note: Trivia tagged to conform to National Geochemical Reconnaissance Map 74-1984, Open File 420, Map 75-1979, Open File 419 and Map 76-1976, Open File 420

QUATERNARY
Qa | Unconsolidated glacial and alluvial deposits

CRETACEOUS
Kc | Sandstone, shale and conglomerate; Ch, DONNELLY CREEK FORMATION: sandstone, shale and coal; Cbs, DONNELLY CREEK FORMATION: conglomerate and sandstone; Ch, BATES MESA FORMATION: shale and siltstone
Ks | Sandstone, siltstone and shale; Sm, CANADIAN NATIONAL FORMATION: fine and coarse-textured, poorly consolidated sandstone

JURASSIC
Jd | Diorite and gabbro

TRIASSIC
Tr | Bedded green and maroon shale and breccia

PERMIAN
P | SUNN HILL QUARTZITE: recrystallized quartzite, minor slate and phyllite

CARBONIFEROUS
C | LOWER SICKER divisions: argillites, slate, phyllite and minor quartzite, tuff, conglomerate and shale

DEVONIAN
D | DONALDSON FORMATION: limestone and shale; unnamed clastics and carbonates

SILURIAN
S | TAKWAKEI FORMATION: gray chert and limestone, Sm, ARDELL CREEK MEMBER: limestone, shale, carbonate and clastics, undifferentiated
CONGLOMERATES TO PERMIAN
Pc | CANADIAN NATIONAL shale and limestone; HART RIVER FORMATION: shale, siltstone and limestone; Cisburne Group undivided; Ch, limestone, black shale, chert, chert-pebble conglomerate, argillaceous limestone and minor sandstone
Cc | CAT CREEK FORMATION: shale; minor conglomerate

DEVONIAN TO CARBONIFEROUS
DC | EARN FORMATION: black shale; SATAN RIDGE FORMATION: chert-pebble conglomerate and limestone-pebble conglomerate; shale, argillite, limestone conglomerate and minor chert-pebble conglomerate and quartzite

LEGEND TO REGIONAL GEOLOGY

Kc | DELUSTY FORMATION: Trbs(Sm), CANADIAN FORMATION: Trbs(Sm); MIDDELL FORMATION: Trm(Sltst and Shale); unnamed limestone, siltstone, sandstone and shale; Trbs(Sm), Basal black shale
ORDOVICIAN AND SILURIAN
OS | ROSE RIVER FORMATION: shale, limestone, black chert and argillite; minor quartzite and chert-pebble conglomerate
O | DOLOMITE and limestone; argillaceous limestone and dolomites
SILURIAN
S | Limestone and dolomite, minor red shale; unnamed clastics; Sm, SUNN HILL QUARTZITE: massive quartzite, minor slate and phyllite; Sqp(Sltst Phm and Sltst); Sm, EARLY CREEK: limestone, unnamed dolomite and limestone
PRECAMBRIAN AND/OR LOWER
Pc | Dark green volcanic rocks; breccia, tuff, agglomerate, chert, argillite, greywacke and conglomerate
Pc | Quartzite, sandstone, quartz-pebble conglomerate, minor red green shales, intrusive rocks, quartz-mica schist, phyllite, limestone and black chert
UNDIVIDED
Pc | Gneissed carbonates and clastics
Pc | PANTHER GROUP: mafic lavas, fine tuff and agglomerate
METAMORPHIC
Pc | CRYSTOCRAG FORMATION: sandstone and dolomite, TAYLOR FORMATION: sandstone and dolomite, gneissed carbonates, chert and quartz
Pc | Orange dolomitic, rusty, pelitic, gray dolomite, gray and maroon limestone, minor clastics; Trbs(Sm), Black shale, argillite and limestone
MILLIGAN AND CFS GNEISSES
Pc | Argillite, slate, phyllite quartzite, dolomite, conglomerate and diffluted limestone

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

Geology generated from geochemical maps by A.D. Goodfellow from blind River (1966) and Hart River (1981) by D.G. Harris (G.S.C. Open File 274, 1975); and Eagle River (1963) manuscripts unpublished map by O.E. Harris

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 in 1956, 1958

Mean magnetic declination 1977, 29°52.2' East, decreasing 2.4' annually. Readings vary from 29°30.6' in the SE corner to 30°13.2' 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 medium and the analytical method employed.

Physiographical regions within the survey area include the Abermoth, Guthrie and Richardson Mountains, and the Eagle Plains and Bonnet Plume basins. Most of the sediments in the mountainous areas are derived from the local bedrock and reflect the breakdown of the underlying rocks and has been transported as particulates during the heavy spring run-off. Stream sediments range in size from fine silt to boulders with only minor organic matter present. By contrast, streams intersecting the Eagle Plains and Bonnet Plume basin are commonly discoloured, flow at low velocities, and deposit fine silt and clay. Organic matter accumulates rapidly in these areas and may play a significant role in the transport and deposition of certain elements (eg. U, Zn, Cu, Ni, Mo, etc.) and may therefore produce spurious anomalies. It is recommended that the -80 mesh fraction of the sediment be used for the data plotting 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 Precambrian to Cretaceous. Mineral deposits of almost every type are represented. To date, it has been reported to occur in basins associated with the Proterozoic sedimentary and volcanic rocks of the Wernecke Mountains. Other geological environments that are considered to have a high-U potential in the survey area include the following: the Mesozoic alkaline stocks and dykes which intrude the Proterozoic and Paleozoic rocks of the Richardson Mts.; Mesozoic and Cenozoic sedimentary basins such as the Eagle Plains and Bonnet Plume basin; and structures such as faults and unconformities which may serve as favorable sites for mineralization.

Because of the mechanical derivation of stream sediments from mountainous terrain, the geochemistry is strongly influenced by the chemistry of the underlying rocks. For example, the Proterozoic sedimentary rocks are characterized by low U and Th values. Paleozoic and Mesozoic rocks, have high background concentrations for U and most other elements determined which is reflected in the geochemistry of the stream sediments. Therefore, it is suggested that each stream system be evaluated in terms of the local factors affecting the geochemistry of the surficial environment.

Interpretation of the regional distribution of U, Th, Cu, Pb, Zn and base metal mineralization should be considered when evaluating geochemically anomalous stream sediments. For example, Ba, Cu, Co and to a lesser extent, Mo, Y, and V are associated with the Proterozoic sedimentary and volcanic rocks. Ni, Cr and Co values would be expected to be associated with primary ultramafic to ultrabasic plutons. Furthermore, element associations in stream sediments and waters will be useful in identifying regional geochemical trends that may be, at least in part, controlled lithologically. Anomalous geochemical trends within these regional patterns should be followed up by detailed sampling in order to delineate the limits of not only the anomalous concentrations but also element interrelations.

The concentration of an element at a sample site is graphically represented as one of 10 symbols. The class intervals are based on a log-normal distribution of the statistical. The symbols are arranged so that they first increase in size in the eight symbol and then increase in blackness to the fifteenth. The two small crosses at the end of the range are used to represent concentrations greater than the upper analytical detection limit, or in the data group containing the detection limit. The data are grouped on a semi-logarithmic scale, i.e. 1,2,5,10,20,50,100 etc. Five decades can be summed and this arithmetic division has been chosen for the conterminous Canada-wide series of maps constituting the National Geochemical Reconnaissance Programme. The class interval limits are established graphically from the histogram element's based on the histogram and cumulative frequency plot for the total survey data from one, or more contiguous, open file sheets covered in one field season.

The class interval limits are established graphically from the histogram. The group usually includes the median of the data as defined by the C.S. (82%) point on the cumulative frequency plot. Some, or all, of the remaining 15 symbols are chosen to represent the remaining data above the median.

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 thorough interpretation, the field and analytical data provided in the data listings should be consulted. To assist in the appraisal of the data in terms of the symbol maps, histograms for the data are presented below. The data for each sample medium are derived from within each bedrock unit, or broad lithologic unit, is presented below the histograms. In many instances, the table will also illustrate, more clearly than the histogram, the relationship between the various rock units. It will also be observed that whilst the total data appears to approximate a log-normal distribution the data for individual map or lithologic units appears to approximate a log-normal distribution. This is particularly evident for those units which have a detection limit for a large number of samples (e.g. U and Th waters, Pb, Mo and U in sediment). In these situations, the frequency distribution will be positively skewed and the data will not represent the total population. Therefore, caution must be exercised when using the table of summary statistics to establish background and threshold populations for each of the rock units.

To comprehensively study an area, all available geological, environmental and recorded data should be utilized. The data separation by bedrock type can often be misleading and may be best used as a guide only. Local threshold levels based on the most detailed and up-to-date knowledge available.

Table of Summary Statistics for Sample Media Materials in the Driftwood Lithologies

Lithology	No. of Samples	Geometric Mean	Mean	Arithmetic S.D.	C.V.%
Bchonite	90	562	650	497	75
Argillite	56	1000	1162	1000	86
Argillite	108	688	782	1282	164
Shale	457	1333	1683	2781	151
Limestone	5	1000	1000	1000	100
Siltstone	23	1777	1662	1581	95
Greywacke	72	1255	1267	1239	98
Quartzite	112	1067	1136	818	72
Conglomerate	58	871	983	767	78
Chert	11	1000	1000	1000	100
Basalt	16	1104	1452	1858	128
Diorite	6	1146	1173	306	26
Undivided Sedimentary Rock	46	1629	3178	4732	

Data units are in ppm

NATIONAL GEOCHEMICAL RECONNAISSANCE MAP 76-1976
OPEN FILE 420

Resource Geophysics and Geochemistry Division

Geological Survey of Canada, Ottawa

Planning and coordination by staff of the Geochemical and Geophysical Analytical and Geochemistry Division, and of the Cordilleran Subdivision, Regional and Economic Geology Division.
Field investigations by D.G. Lund and W.D. Goodfellow
Analytical contract supervision by J.J. Lynch
Data monitoring and compilation by R.G. Garrett, N.S. Lund and D.J. Chilcott.

Contractors

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

This map forms one of a series of 45 sheets released under Geological Survey of Canada, Open Files 418, 419, 420. The Open Files consists of 15 maps for each element, one for each of the elements Mo, Cu, Pb, Zn, Ag, Ni, Co, As, U, Th, Fe, Mn, Sr, Ba and V, in stream waters and sample site locations.

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

The Director,
Computer Science Centre,
Geological Survey of Canada, Energy, Mines and Resources
Ottawa, Ontario K1A 0E9

NATIONAL GEOCHEMICAL RECONNAISSANCE MAP 76-1976
OPEN FILE 420
NORTHERN TERRITORIES, 1976
DARIUM

DARIUM IN STREAM SEDIMENTS

URANIUM RECONNAISSANCE PROGRAM

Scale 1:2,500,000

Kilometers 0 5 10 15 20 25 30 35 40 45 50 Kilometers
Miles 0 5 10 15 20 25 30 Miles

Universal Transverse Mercator Projection
© Crown Copyrights reserved

This map has been reproduced in facsimile version of the original map and may not be suitable for further reproduction (Xerox or Copy).