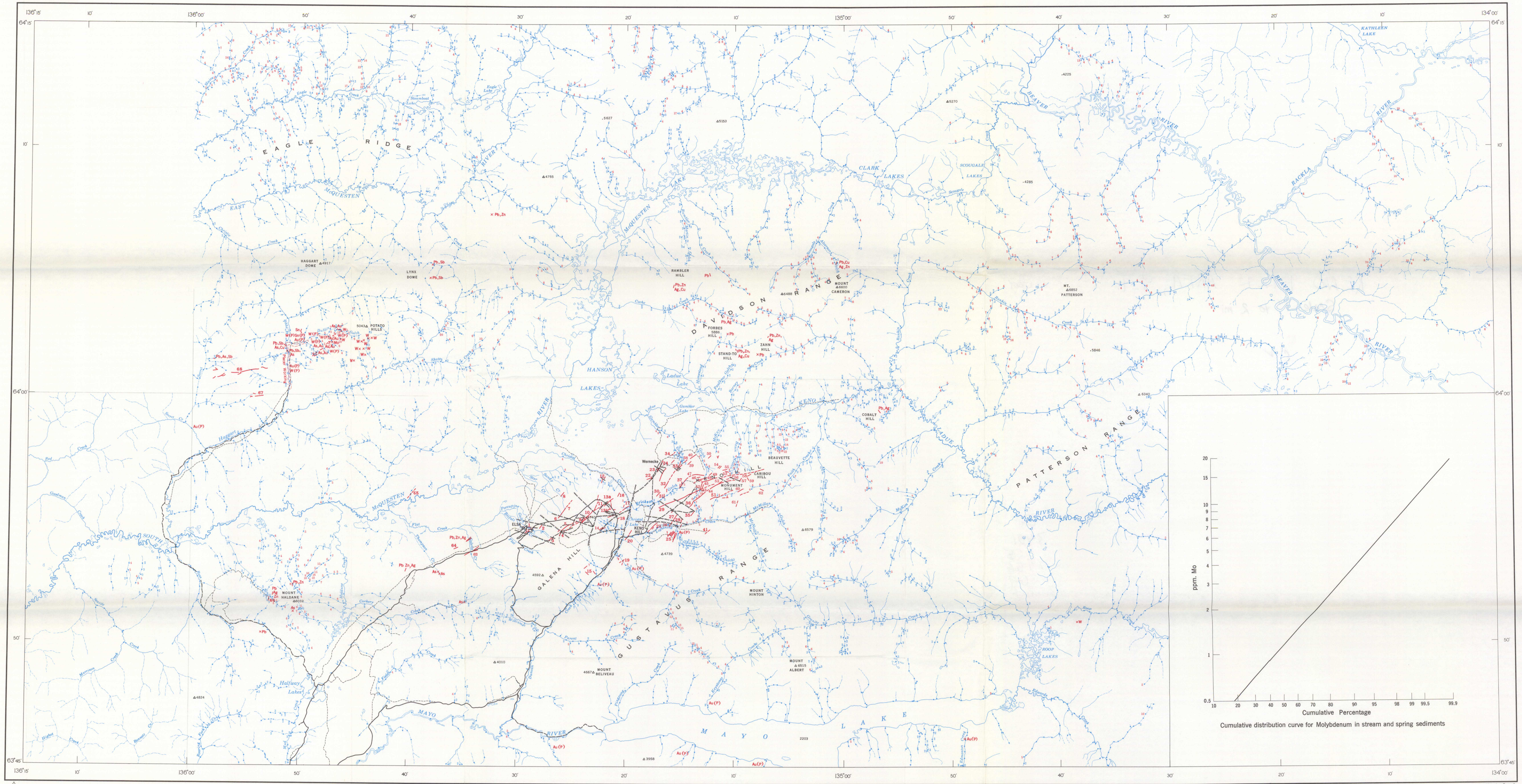
GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

PRELIMINARY SERIES



Cumulative distribution curve for Molybdenum in stream and spring sediments

LEGEND

Concentration of molybdenum, 1 ppm or less
in stream sediments........ in spring sediments.......

Concentration of molybdenum, 2 to 3 ppm
in stream sediments.......2 in spring sediments.......3

Concentration of molybdenum, 4 ppm or greater
in stream sediments.......5 in spring sediments.......5

Location of known veins ....

Mineral occurrence .... Mo ×

Mineral deposit 3

Mineral Symbols

Arsenic	As	Silver	Ag
Antimony	Sb	Tungsten lode	W
Copper	Cu	Tungsten (placer)	W(P)
Gold (lode)	Au	Tin (lode)	Sn
Gold (placer)	Au(P)	Tin (placer)	Sn(P)
Lead	Pb	Zinc	Zn
Molybdenum	Mo		

INDEX TO MINES AND PROSPECTS

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4. Arctic and Mastiff
5. Ruby
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7. Betty
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52. Gold Hill No. 2
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57. Duncan
58. Alice
59. Caribou
60. Divide
61. Devon
62. Faith
63. Silver King
64. Gerlitsky
65. Shanghai
66. Lookout
67. Rex
68. Peso Silver

Field work by C. F. Gleeson, W. M. Tupper, A. Suparman, K. Domai, M. Shafiqullah, J.A. Colwell, J.R. Deighton, C.H. Yurchak, J.K. Worth, H.R. James, A.G. Troup, G. Wind, L. Hogg, and F.R. Campbell

Analyses by J. J. Lynch, J. Robinson and B. Mathie.

Compilation and text by C. F. Gleeson

Geological cartography by the Geological Survey of Canada, 1966

Roads, all weather ....

Other roads ....

Trail ....

Intermittent lake and stream ....

Horizontal control point .... △

Elevation in feet above mean sea-level 2095

Base-map cartography by the Geological Survey of Canada, 1966
from maps published by the Surveys and Mapping Branch and by
the Army Survey Establishment, R. C. E.

Approximate magnetic declination, 34° 45' East, decreasing 4.2' annually

DESCRIPTIVE NOTES

Introduction

The reconnaissance geochemical survey of Keno Hill area, Yukon Territory was started and completed in the summer of 1964. The creeks not accessible by roads were reached by helicopter. An attempt was made to maintain a sample interval of 1,500 feet along all rivers, creeks, and their tributaries.

The data on this map are based on 5,900 samples of stream sediment collected from the channels of the streams and on the sediments and precipitates in the vicinity of springs from an area of approximately 1,900 square miles. Where possible the active channel was sampled; however as work progressed it was found that moss on the creek banks below the water line had trapped considerable amounts of fine sediment suitable for sampling. The wet sediments and waters were analyzed at the sample site for cold citrate-soluble heavy metals. The results of this work have been published in a series of 14 preliminary maps (Gleeson, et al., 1965). Field observations on the character of the stream, composition of the sediment, pH and temperature of the water, and rock types in the vicinity of the sample station were entered in code on special geochemical field cards. Subsequently, this information was punched on cards for electronic data processing.

The wet sediment was dried in the field at a temperature of about 60° C and sieved through an 80 mesh stainless steel screen. The sieved samples were shipped to Ottawa where they were ground to minus 100 mesh in a ceramic ball mill.

Analysis

Samples of the stream and spring sediments were analyzed for molybdenum by using a technique described by North (1956)

General Geology

The regional geology has been described by Bostock (1947, 1964), and Green and Roddick (1962). More detailed geological studies have been made by Kindle (1962), McTaggart (1960), Poole (1965), and Green (1957, 1958). The geology, geochemistry, and origin of the mineral deposits in Keno Hill and Dublin Gulch areas have been described by Boyle (1965). Reports by Aho (1964) and Cockfield (1922) provide further information on mineral deposits of the area.

The map-area is underlain by a series of metamorphosed sedimentary rocks, mainly quartzites, phyllites, slates, chlorite, sericite and graphite schists, also grits and minor limestone. The age of these rocks is uncertain and appears to range from Precambrian to Mesozoic (Poole, 1965; Tempelman-Kluit, 1966).

A dolomite and limestone unit outcrops in the northeast part of the area. Fossils from these rocks range in age from Late Cambrian to Late Silurian or Early Devonian (Green and Roddick, 1962).

Mafic igneous sills and lenses now altered to greenstones are interlayered with the metamorphosed sediments. Quartz-feldspar porphyry sills and lamprophyre dykes are present locally. Granitic stocks cut the metamorphosed sediments east and north of Mayo Lake, northwest of Hanson Lake, south of Dublin Gulch and in the vicinity of Mount Haldane.

Scarn zones containing scheelite occur in the vicinity of some of the granitic masses particularly around Dublin Gulch, Mount Haldane, and east of Mayo Lake.

Most of the lead-silver ore deposits in the Keno - Galena Hills area occur along northeasterly striking vein faults in thick-bedded quartzite and occasionally in greenstone (Boyle, 1965). In the Dublin Gulch area quartz arsenopyrite-gold veins with a general northeast strike are present near the contacts of the granitic stocks. Also easterly striking vein faults are mineralized with siderite, jamesonite, boulangerite, pyrite, arsenopyrite, galena, tetrahedrite, and chalcopyrite. Two cassiterite-tourmaline veins occur on the right limit of Dublin Gulch nears it mouth (Boyle, 1965; Poole, 1965). Also northerly striking lead-zinc-silver veins are present in Davidson Range (Cockfield, 1922; Aho, 1964). Placer gold has been recovered from Dublin Gulch, Haggart Creek, and Duncan Creek since 1898.

The area has undergone several stages of glaciation. Thick glacial deposits occupy the major valleys and hill slopes below an elevation of 3,000 feet Permafrost is present throughout the area.

Results

Statistical studies using electronic computation still have to be completed and until this is done adequate, assessment of the results is difficult. However cumulative distribution curves have been constructed from information supplied by the computer. The curve for molybdenum is illustrated below. The curve fits a straight line indicating that molybdenum is distributed lognormally in the stream and spring sediments of this area.

Values for molybdenum in the sediments range from less than 1 ppm to 48 ppm. For this map the samples have been grouped as follows: 1 ppm and less (49% of the samples), 2 to 3 ppm (34% of the samples), and 4 ppm and greater (17% of the samples).

The majority of the values greater than 4 ppm are distributed over areas underlain by quartzites and phyllites. Sediments in streams draining graphite and pyrite-rich phyllites in Davidson and Patterson Ranges appear to contain higher than average amounts of molybdenum. Molybdenum values are high in some areas where granitic rocks intrude the metamorphosed sediments (e.g. Mount Haldane and Dublin Gulch). During the field season a minor amount of disseminated molybdenite was found in the granite in the vicinity of Dublin Gulch. Many of the high molybdenum areas are also anomalous in other metals, especially zinc.

To explain fully the distribution of molybdenum in the spring and stream sediments of the area more field work is required.

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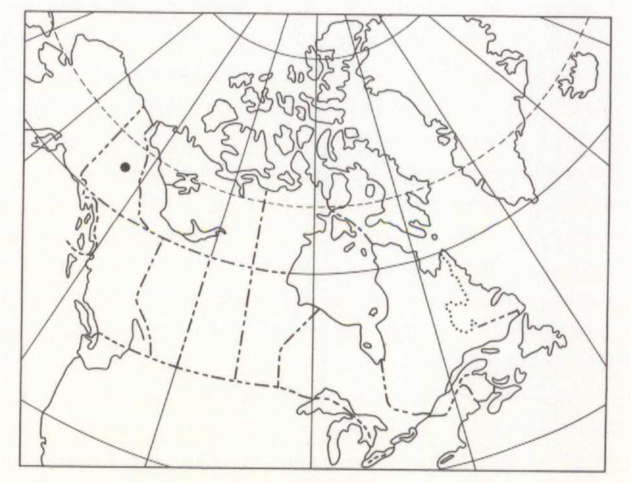

INDEX MAP

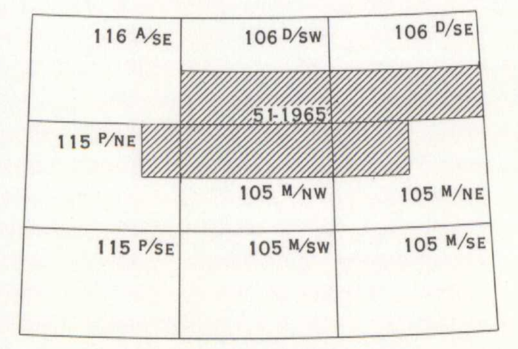
MAP 51-1965
MOLYBDENUM CONTENT OF STREAM AND SPRING SEDIMENTS
KENO HILL AREA
YUKON TERRITORY

Scale 1:126,720
1 inch to 2 miles

Miles 2 0 2 4 6 Miles

Kilometres 3 0 3 6 9 Kilometres

Printed by the Surveys and Mapping Branch
Copies of this map may be obtained from the Director, Geological Survey of Canada, Ottawa



N. T. S. REFERENCE
KENO HILL AREA
YUKON TERRITORY