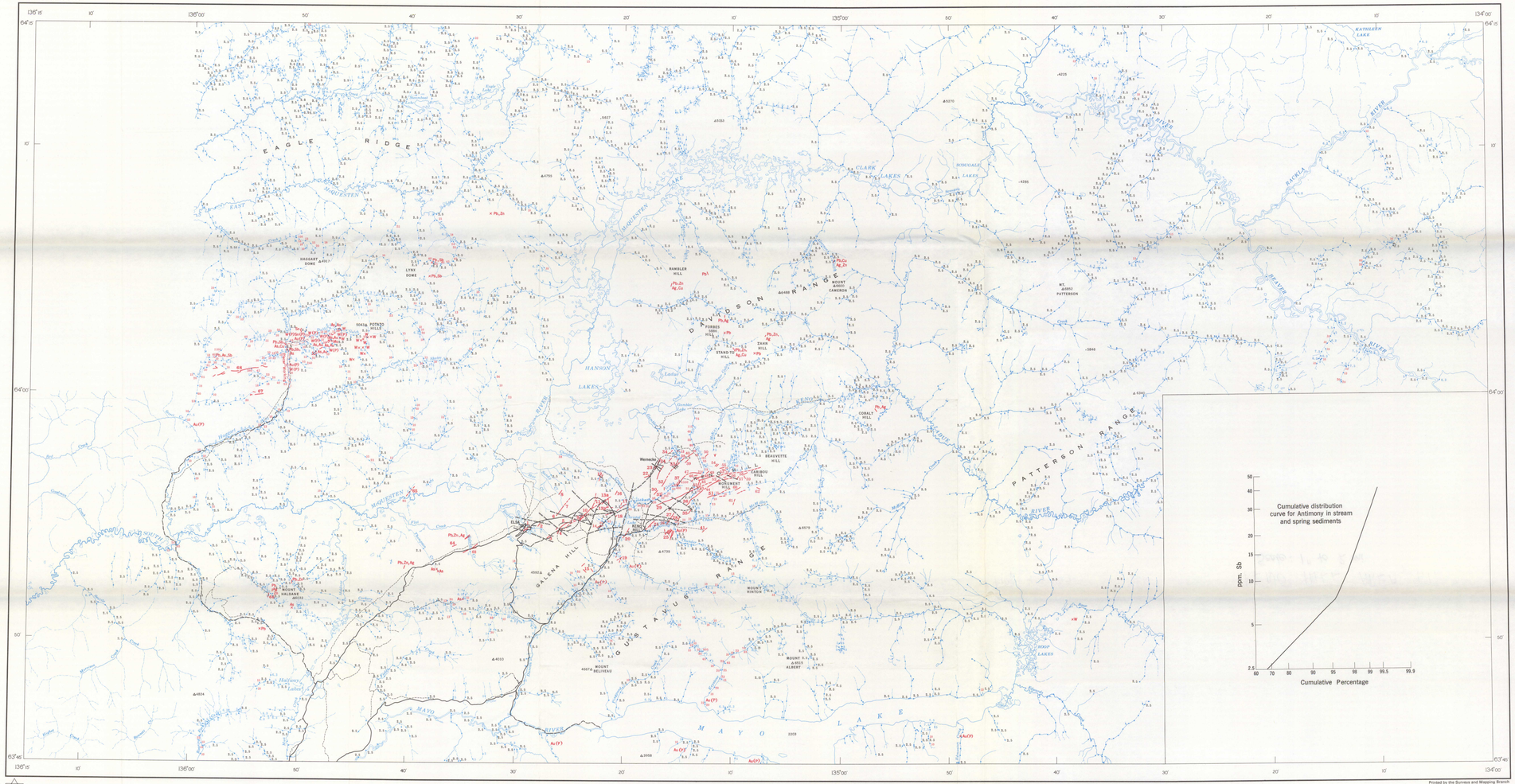
GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

PRELIMINARY SERIES



LEGEND

Concentration of antimony, less than 2.5 ppm in stream sediments..... in spring sediments.....i

Concentration of antimony, 2.5 ppm to 7.5 ppm in stream sediments.....i.5 in spring sediments.....i.5

Concentration of antimony, 5 ppm to 7.5 ppm in stream sediments.....5 in spring sediments.....5

Concentration of antimony, 10 ppm and greater in stream sediments.....10 in spring sediments.....10

Location of known veins

Mineral occurrence

Mineral deposit

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

1. Elsa
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6. No Cash
7. Betty
8. Cream
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13b. Galliero (Sirno and Sagiyama veins)
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57. Duncan
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59. Caribou
60. Divide
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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. Sugarman, K. Domai, M. Shafiqullah, J. A. Colwell, J. R. Deighton, C. H. Yurchak, J. K. Worth, H. R. James, A. G. Troop, G. Wind, L. Hogg, and F. R. Campbell

Analyses by: J. J. Lynch, G. Mihailov, S. Blundon and G. MacGillivary

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 2043

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 5,500 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 1,800 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.

Analytical Techniques

Samples of stream and spring sediments were analyzed for antimony using a hydrochloric acid extraction after they were heated with ammonium chloride. Colorimetric determinations were made using the techniques described by Stanton and McDonald (1962).

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 (1952), 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 Abo (1964) and Cockfield (1925) 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 stills and lenses now altered to greenstones are interlayered with the metamorphosed sediments. Quartz-feldspar porphyry stills and lamprophyre dykes are present locally. Granitic stocks cut the metamorphosed sediments east and north of Mayo Lake, northwest of Hunson Lake, south of Dublin Gulch and in the vicinity of Mount Haldane.

Skarn 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 near its mouth (Boyle, 1965; Poole, 1965). Also northerly striking lead-zinc-silver veins are present in Davidson Range (Cockfield, 1922; Abo, 1964). Placer gold has been recovered from Dublin Gulch, Hunt 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 are still in progress and until this phase of the work is completed adequate assessment of the results will be difficult. However cumulative distribution curves have been constructed from information supplied by the computer. The curve for antimony is illustrated. A distinct break occurs in the slope of the curve at 7.5 ppm. This suggests the presence of two distributions, however both parts of the curve fit straight lines indicating that they are probably log normal distributions.

Values for antimony vary from less than 2.5 ppm to 1300 ppm. For this map values have been grouped into the following three classes; 2.5 ppm and less (67 per cent of the samples), 5 to 7.5 ppm (29 per cent of the samples), and greater than 10 ppm (14 per cent of the samples).

Antimony is high in the vicinity of lead-silver sulphantimonite and gold – arsenopyrite – pyrite deposits of the Dublin Gulch area. In general there appears to be some correlation between the high arsenic values (GSC Map 45-1965) and high antimony values, however arsenic is more dispersed than antimony. Most of the known lead-silver deposits of Keno Hill and Galena Hill have high antimony values in the sediments of the streams draining them, although some of the creeks are high because of contamination from mine workings.

The highest antimony values are on Secret Creek, west of Dublin Gulch, and on Keystone Creek, a tributary on the north side of Mayo Lake. In the former up to 1300 ppm is present in the sediments and in the latter up to 430 ppm is found. The length of the anomalous trains in the map area vary from less than a half mile up to 5 miles.

Further follow up work is warranted to adequately explain the distribution of antimony in the stream and spring sediments of the area.

Abo, A. E. : Mineral potential of the Mayo district; Western Miner, vol. 37, No. 10, pp. 80-88 (1964).

Bostock, H. S. : Mayo, Yukon Territory; Geol. Surv. Can., Map 989A (1947).

_____ McQuesten, Yukon Territory; Geol. Surv. Can., Map 1143A (1964).

Boyle, R. W. : Geology, geochemistry, and origin of the lead-zinc-silver deposits of Keno Hill – Galena Hill area, Yukon Territory, Geol. Surv. Can., Bull. 111 (1965).

Cockfield, W. E. : Silver-lead deposits of Davidson Mountains, Mayo District, Yukon Territory; Geol. Surv. Can., Summ. Rept., 1921, pt. A, pp. 1A-6A (1922).

Gleeson, C. F., et al. : Heavy metal content of stream and spring sediments; Heavy metal content of stream and spring waters, Keno Hill area, Yukon Territory, Geol. Surv. Can., Maps 18-1964 to 31-1964 (1965).

Green, L. H. : Mayo Lake, Yukon Territory; Geol. Surv. Can., Map 5-1956 (1957).

_____ McQuesten Lake and Scougale Creek map-areas, Yukon Territory; Geol. Surv. Can., Paper 58-4 (1958).

Green, L. H., and Roddick, J. A. ; Dawson, Larsen Creek, Nash Creek map-areas, Yukon Territory, Geol. Surv. Can., Paper 62-7 (1962).

Kindle, E. D. : Keno Hill, Yukon Territory, Geol. Surv. Can., Map 1105A (1962).

McTaggart, K. C. : The geology of Keno and Galena Hills, Yukon Territory; Geol. Surv. Can., Bull. 58 (1960).

Poole, W. H. : Report of activities: field, 1964; Geol. Surv. Can., Paper 65-1, pp. 33-34 (1965).

Stanton, R. E., and McDonald, A. J. : Field determination of antimony in soil and sediment samples. Trans. Inst. Min. and Met. Vol. 71, Part 9, 1961-62.

Tempelman-Kluit, D. : Report of activities, May to October, 1965; Geol. Surv. Can., Paper 66-1, pp. 46-49 (1966).

Published 1967, the Centennial of Canadian Confederation
1867 1967

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

MAP 49-1965

ANTIMONY CONTENT OF STREAM AND SPRING SEDIMENTS

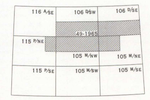
KENO HILL AREA

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

INDEX MAP



M. T. S. REFERENCE

KENO HILL AREA
YUKON TERRITORY