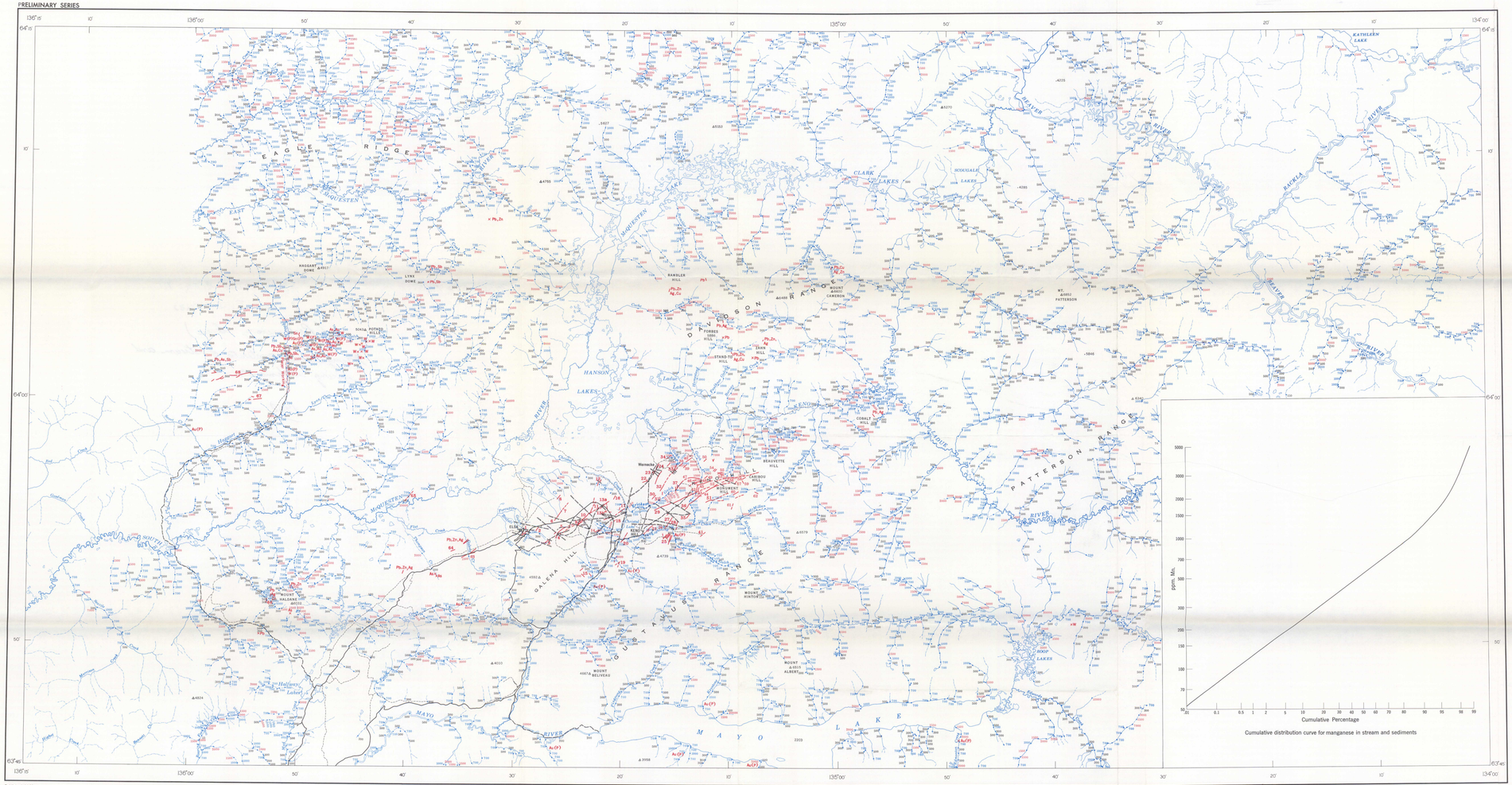
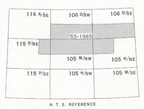
GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

PRELIMINARY SERIES



Cumulative distribution curve for manganese in stream and sediments



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

LEGEND

Concentration of manganese, 50 to 500 ppm in stream sediments ..... in spring sediments .....

Concentration of manganese, 750 to 1000 ppm in stream sediments ..... in spring sediments .....

Concentration of manganese, 1500 ppm and greater in stream sediments ..... in spring sediments .....

Location of known veins .....

Mineral occurrence ..... Au ×

Mineral deposit 12

Mineral Symbols

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

INDEX TO MINES AND PROSPECTS

1. Elsa
2. Dixie
3. Coral and Wigwam
4. Arctic and Mastiff
5. Baby
6. No Cash
7. Betty
8. Cream
9. Sector
10. Calumet
11. Dragon (Un)
12. Formo
13a. Galkeno (McLeod vein)
13b. Galkeno (Rene and Sogiyama veins)
14. Eagle
15. Fisher Creek
16. Bluebird
17. Tin Can
18. Rico
19. Duncan Creek
20. Moth
21. Onek
22. Klondyke-Keno
23. Sadie-Friendship
24. Ladue
25. Belleketno
26. Mount Keno (Hogan vein)
27. Ashtetno
28. Mount Keno (Runer vein)
29. Dorothy
30. Kijo
31. Crowsnest No. 1
32. Black Cap and Shepherd
33. Lucky Queen
34. Lake
35. Vanguard
36. Apex
37. Shamrock
38. Highlander
39. Cub and Bunny
40. Moan
41. Homestake
42. No. 6
43. Porcupine-Kinman
44. Comstock
45. No. 9
46. No. 1
47. Gambler
48. Main fault and Nabob
49. Lake View
50. Nabob No. 2
51. Helen Fraction
52. Gold Hill No. 2
53. Ladue Fraction
54. Fox
55. Silver Basin
56. Gold Queen
57. Duncan
58. Alice
59. Caribou
60. Divido
61. Devon
62. Faith
63. Silver King
64. Gerlitsky
65. Shanghai
66. Lookout
67. Box
68. Peso Silver

Field work by C. F. Gleeson, W. M. Tupper, A. Superman, 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 C. C. Durham

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 2041

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

Published, 1968
Copies of this map may be obtained from the Director, Geological Survey of Canada, Ottawa

INDEX MAP

MAP 55-1965

MANGANESE 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

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 5,000 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 1,000 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 16 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 a -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

Manganese was analyzed spectrographically by total energy D.C. arc semi-quantitative method using a Jarrell Ash optical spectrograph with a 1.5 metre grating. A 10 milligram sample of ground stream sediment was mixed with 20 milligrams of graphite, packed into a carbon electrode, and capped with a 20 milligram buffer mixture of calcium carbonate and graphite. The loaded electrode was preheated at 450° C to oxidize the organic matter in the sample and thus allow the arcing to proceed smoothly without loss of material from the electrode cavity. The electrode was then removed from the furnace after 45 minutes and cooled. Two drops of a saturated solution of magnesium nitrate in absolute ethyl alcohol were added in order to promote the smooth burning of the sample. The electrode was placed under an infrared lamp for at least five minutes to evaporate the alcohol. The samples were arced at 15 amps, and the spectra recorded on 35 mm Kodak Spectrum Analysis Film Number 1. The unknown spectra were then compared with a synthetically prepared series of spectra; the limit of detectability for manganese was 20 ppm.

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 graphitic 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 northern 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 near its 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.

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 the information supplied by the computer. The curve for manganese is illustrated on this map. A distinct break occurs in the slope of the curve at 1500 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 manganese range from 50 ppm to greater than 10,000 ppm. For this map the samples have been grouped as follows: 50 to 500 ppm (background), 700 to 1000 ppm (threshold), and greater than 1500 ppm (anomalous).

The ability of manganese in the form of hydroxide, hydroxide gels and hydrous oxide gels to adsorb and or coprecipitate many heavy metals such as Ba, Ni, Co, Cu, Pb, Zn, As, Sb and Ag is well known. Thus an enrichment of the above metals may occur in stream sediments where the manganese content is high. Hence when interpreting the geochemical results on other metal maps of this series (Nos. 45-1965 to 56-1965) the enrichment role of manganese should be kept in mind. However manganiferous siderite is associated with many of the silver veins in the area and hence it would be unwise to eliminate anomalies solely on the basis of high manganese values.

Areas particularly high in manganese include the drainage systems of Mount Haldane, Galena Hill, Keno Hill, Davidson Range, the northeast sector of Gustavus Range, north of McQuesten Lake, and Eagle and Rucker Creeks in the northwest corner of the area. Known silver - lead deposits occur in the first four of the above mentioned areas.

Aho, 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 890A (1947).

_____: McQuesten, Yukon Territory; Geol. Surv. Can., Map 1163A (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., Map 18-1964 to 33-1964 (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. 32-34 (1965).

Tempelman-Kluit, D.: Report of activities, May to October, 1965; Geol. Surv. Can., Paper 66-1, pp. 48-49 (1966).

This map has been produced from a scanned version of the original map
Reproduction par numérisation d'une carte sur papier