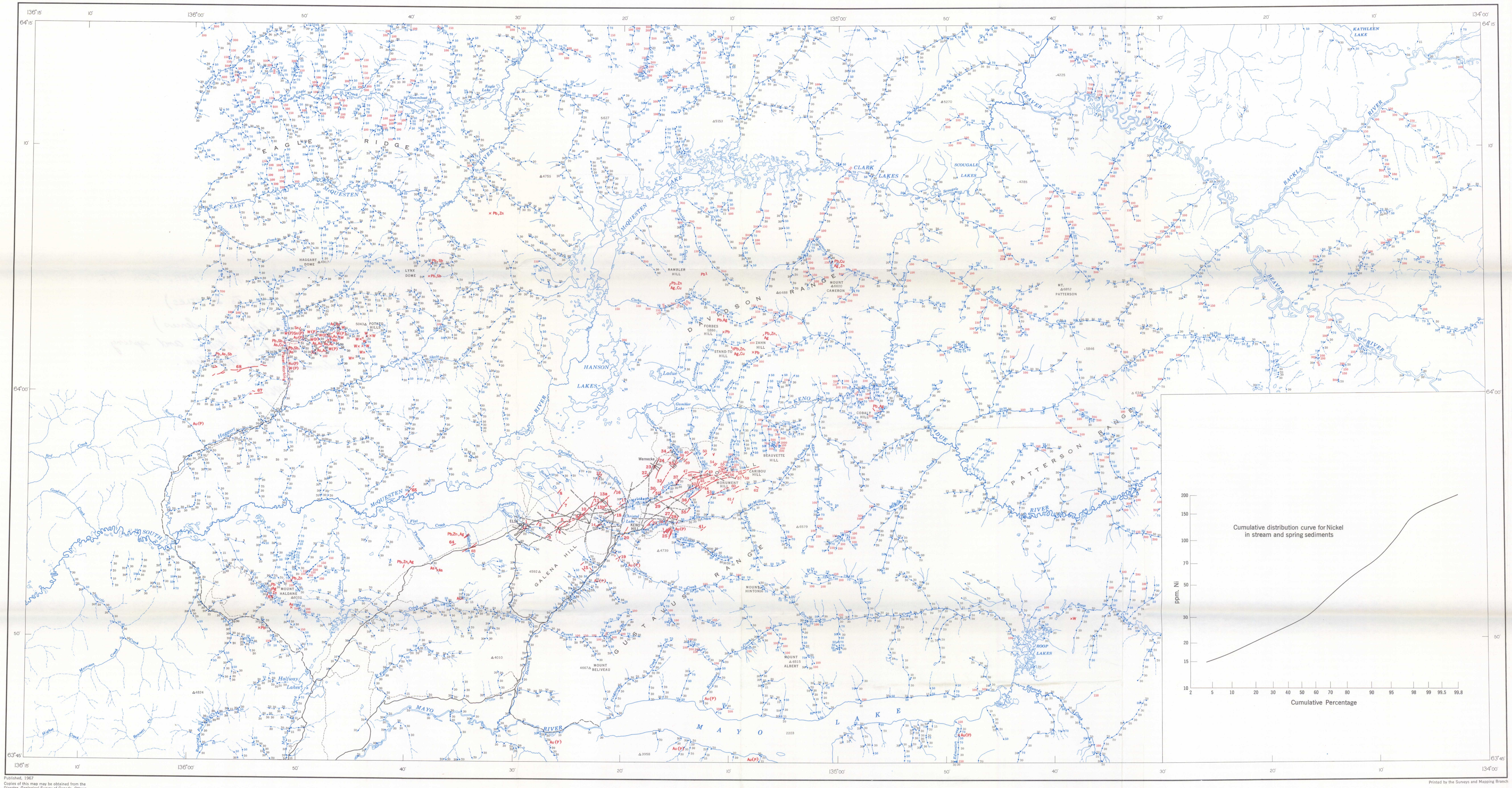
GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

PRELIMINARY SERIES



LEGEND

Concentration of nickel, 30 ppm or less in stream sediments....... 30 • in spring sediments....... 30

Concentration of nickel, 50 to 70 ppm in stream sediments....... 50 • in spring sediments....... 50

Concentration of nickel, 100 ppm or greater in stream sediments...... 200 • in spring sediments...... 200

Location of known veins

Mineral occurrence .... Au ×

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

1. Elsa
2. Dixie
3. Coral and Wigwam
4. Arctic and Mastiff
5. Ruby
6. No Cash
7. Betty
8. Cream
9. Hector
10. Calumet
11. Dragon (UN)
12. Formo
13a. Galkeno (McLeod vein)
13b. Galkeno (Sime and Sugiyama 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. Bellekeno
26. Mount Keno (Hogan vein)
27. Ankeno
28. Mount Keno (Runer vein)
29. Dorothy
30. Kijo
31. Croesus 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. Stone
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. 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 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 .... △

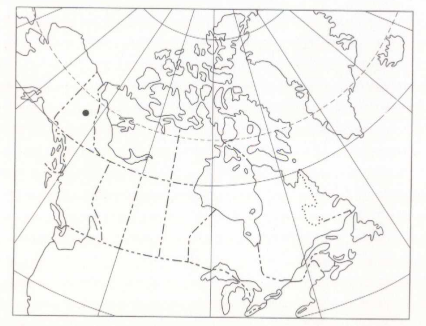
Elevation in feet above mean sea-level 2095

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

Published, 1967
Copies of this map may be obtained from the Director, Geological Survey of Canada, Ottawa

Printed by the Surveys and Mapping Branch



INDEX MAP

MAP 53-1965

NICKEL CONTENT OF STREAM AND SPRING SEDIMENTS

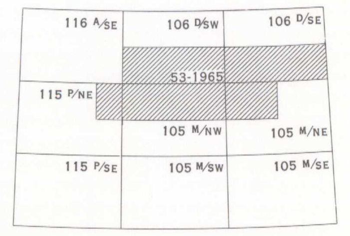
KENO HILL AREA

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



N. T. S. REFERENCE

KENO HILL AREA
YUKON TERRITORY

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

Nickel 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 nickel was 2 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 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 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.

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 have yet to be completed, and until they are adequate assessment of the results is difficult. However, cumulative distribution curves have been constructed from the information supplied by the computer. The curve for nickel is illustrated on this map. Several distinct breaks in the slope of the curve suggest the presence of more than one distribution. The sections between these breaks approximate straight lines thus indicating the data in each segment may be distributed lognormally.

Values for nickel range from less than 2 ppm to 1100 ppm. For this map the samples have been grouped as follows: less than 2 ppm to 30 ppm, 50 ppm to 70 ppm, and greater than 100 ppm.

The majority of high nickel values appear to be related to greenstone bands which are particularly abundant in the areas underlain by phyllites and quartzites. Some of the greenstones are ultramafic in composition and in all probability most of the anomalous nickel values are related to such ultramafic greenstone bands. Nickel values are not high in the sediments of the creeks draining the known silver veins of the area.

In the northwest sector of the map a series of nickel highs appear to be associated with above normal molybdenum values (map 51-1965).

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

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 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., Map 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. 32-34 (1965).

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