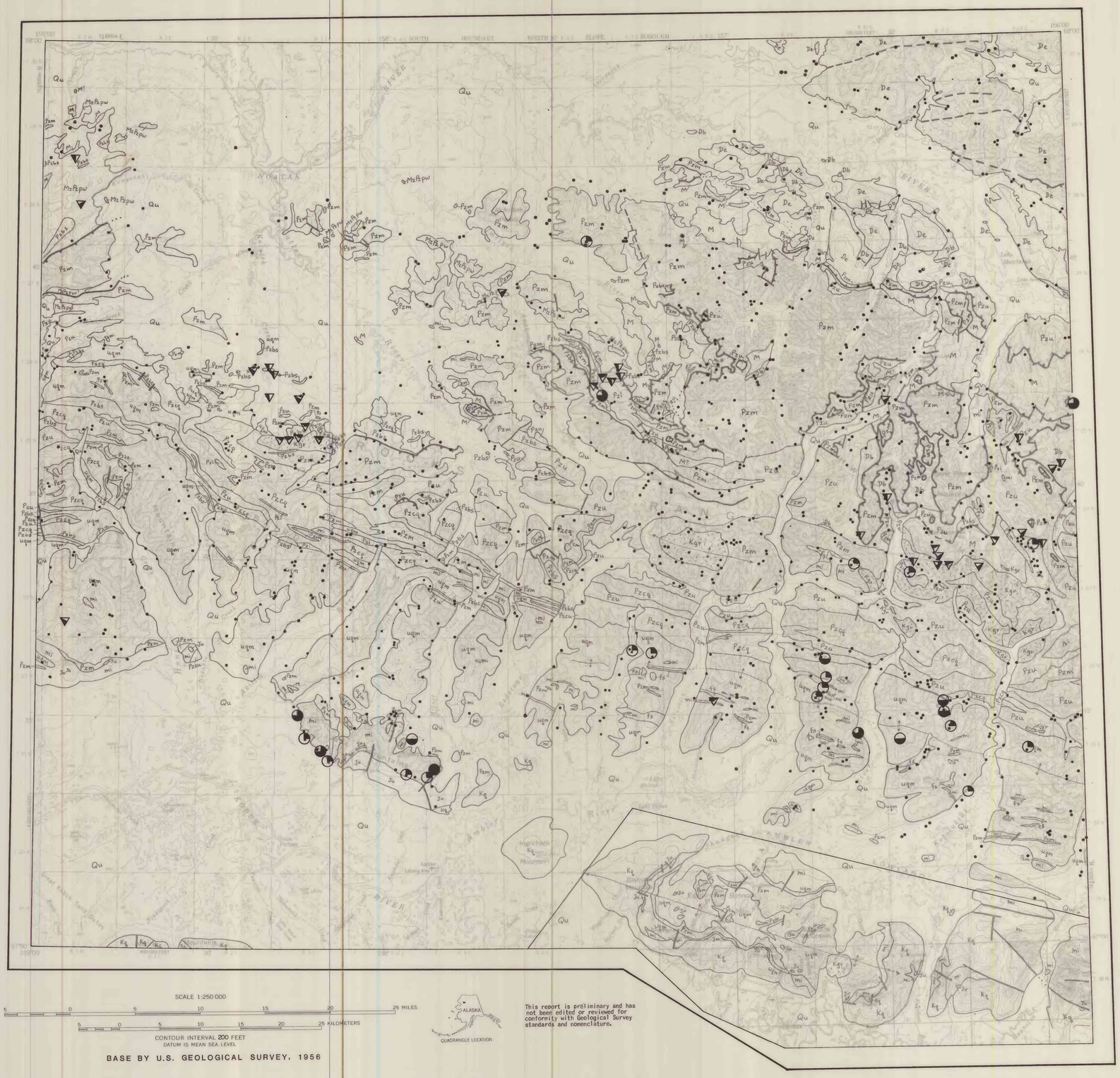
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

# OPEN-FILE REPORT 78-120E

FOLIO OF THE AMBLER RIVER QUADRANGLE, ALASKA

ELLERSIECK - COPPER AND MOLYBDENUM GEOCHEMICAL ANOMALIES




SCALE 1:250 000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

BASE BY U.S. GEOLOGICAL SURVEY, 1956




QUADRANGLE LOCATION

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

## MAP SHOWING COPPER AND MOLYBDENUM STREAM-SEDIMENT ANOMALIES, AMBLER RIVER QUADRANGLE, ALASKA

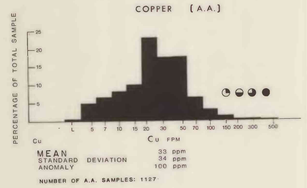
BY INYO ELLERSIECK

1978

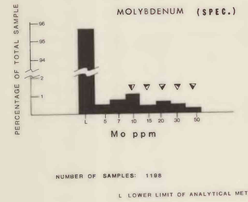
Background information to this folio is published as U. S. Geological Survey Circular 793, available free of charge from the U. S. Geological Survey, Reston, Va. 22092.

## EXPLANATION OF ANOMALY SYMBOLS

COPPER (A.A.)




MOLYBDENUM (SPEC.)




## EXPLANATION FOR GENERALIZED GEOLOGIC MAP

CORRELATION OF MAP UNITS

SURFICIAL DEPOSITS

Qu — QUATERNARY

SEDIMENTARY AND METASEDIMENTARY ROCKS

Kg, Kc — CRETACEOUS

Unconformity

M — MISSISSIPPIAN

Unconformity

De — DEVONIAN

Db — DEVONIAN

Pzm — DEVONIAN AND OLDER

METASEDIMENTARY ROCKS OF UNCERTAIN AGE

MzPzpw — MESOZOIC OR PALEOZOIC

Pzcq, Pzbs — PALEOZOIC

Pzu — PALEOZOIC

uqm — PALEOZOIC AND OLDER (?)

IGNEOUS AND META-IGNEOUS ROCKS

Kgr — CRETACEOUS

Ju — JURASSIC

mi, fs — MESOZOIC AND (OR) PALEOZOIC

Pzi — MESOZOIC AND (OR) PALEOZOIC

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

Qu — UNCONSOLIDATED SURFICIAL DEPOSITS (QUATERNARY)

SEDIMENTARY AND METASEDIMENTARY ROCKS

Kq — QUARTZ CONGLOMERATE, SANDSTONE, AND MUDSTONE (CRETACEOUS)

Kc — IGNEOUS PEBBLE-COBBLE CONGLOMERATE (CRETACEOUS)

M — LISBURNE GROUP AND UPPER PART OF ENDICOTT GROUP (MISSISSIPPIAN)—INCLUDES KAYAK SHALE AND KEKIKTUK CONGLOMERATE

De — LOWER PART OF ENDICOTT GROUP (DEVONIAN)—MAINLY SLATE AND SANDSTONE

Db — DARK CALCAREOUS SCHIST, LIMESTONE, AND SILICEOUS PHYLLITE (DEVONIAN)

Pzm — LIMESTONE AND MARBLE (DEVONIAN AND OLDER)

METASEDIMENTARY ROCKS OF UNCERTAIN AGE

MzPzpw — PHYLLITE AND MAFIC VOLCANIC WACKE (MESOZOIC OR PALEOZOIC)

Pzcq — CHLORITIC QUARTZITE AND SCHIST (PALEOZOIC)—LOCALLY INCLUDES FELDSPATHIC ORTHOGNEISS

Pzbs — GRAPHITIC PHYLLITE AND SCHIST (PALEOZOIC)

Pzu — UNDIFFERENTIATED METAMORPHIC ROCKS (PALEOZOIC)—INCLUDES MARBLE, QUARTZITE, CALC-SCHIST, AND LESSER QUARTZ-MICA SCHIST

uqm — GRAY PHYLLITE AND QUARTZ-MICA SCHIST (PALEOZOIC AND OLDER(?))

IGNEOUS AND META-IGNEOUS ROCKS

Kgr — META-GRANITIC PLUTONIC ROCKS (CRETACEOUS)

Ju — ULTRAMAFIC ROCKS AND SERPENTINITE (JURASSIC)

mi — BASALT, DIABASE, AND GREENSTONE (MESOZOIC AND/OR PALEOZOIC)

fs — FELSIC SCHIST (MESOZOIC AND/OR PALEOZOIC) MAY BE, IN PART, VOLCANIC

Pzi — INTERMEDIATE META-IGNEOUS ROCKS (MESOZOIC AND/OR PALEOZOIC) MAY BE PLUTONIC AND (OR) VOLCANIC, MOSTLY GRANODIORITE OR QUARTZ DIORITE IN COMPOSITION

LITHOLOGIC CONTACT; dashed where uncertain

HIGH ANGLE FAULT, dashed where uncertain, dotted where concealed

THRUST FAULT, dotted where concealed

Generalized geologic map compiled by

C. F. MAYFIELD

### COPPER

Copper was measured by both the atomic absorbtion and emission spectrographic methods. Values from the atomic absorbtion method were used to identify anomalous samples for this map. An anomalous value is defined as one which is more than two standard deviations above the arithmetic mean value.

There are more reported occurrences of copper in the Ambler River quadrangle than any other mineral commodity (Mayfield and Grybeck, 1978). This is probably due in part to the fact that copper minerals can be conspicuous and easy to identify in outcrop. Of 35 copper occurrences which have stream-sediment samples within five km downstream, eight (23%) have associated anomalous values of copper. There are more copper occurrences with associated stream-sediment anomalies of zinc (34%) and silver (26%), suggesting that these elements may be used to locate potential copper occurrences.

The primary concentration of copper anomalies is in the eastern schist belt, often associated with felsic igneous rocks (map unit fs) and/or known copper prospects. The western limit of copper stream-sediment anomalies correlates closely with the western limit of felsic bodies in the schist.

A second area of anomalous copper values is in the southern Jade Mountains. High copper values in this area are probably due to higher background copper concentrations in mafic igneous rocks (map unit mi) which outcrop in a belt nearly coincident with the anomalies. If this is the case, then these copper anomalies may not reflect copper deposits.

A few copper anomalies are in samples near the black phyllites of map units Db and Pzbs. Anomalous copper in these samples is usually associated with anomalous zinc. Shales rich in organic matter, from which the black phyllites were derived, are often enriched in copper and other metals relative to other sedimentary rocks (Tourtelot, 1970).

### MOLYBDENUM

Only about five percent of the samples contain molybdenum in amounts above the five ppm lower limit measurable by the emission spectrographic method. Values of ten ppm and above, 1.8 percent of the samples, are plotted as anomalies.

Molybdenum anomalies are concentrated near the northwestern Shishakshinovik pluton, and north of the Kaluich pluton. There are, however, no molybdenum anomalies near the Redstone pluton. This pattern is also exhibited by tin, lead, beryllium, and zinc.

Molybdenum anomalies also occur near black phyllites of map units Db and Pzbs.

### REFERENCES


Ellersieck, Inyo, 1978a, Map showing stream-sediment geochemical sample locations, Ambler River quadrangle, Alaska: U. S. Geological Survey Open-File Report 78-120 B, scale 1:250,000, 1 sheet.

Ellersieck, Inyo, 1978b, Analytical results for stream-sediment geochemical samples, Ambler River quadrangle, Alaska: U. S. Geological Survey Open-File Report 78-120 C, 6 sheets.

Mayfield, C. F., and Grybeck, Donald, 1978, Mineral occurrences and resources map of the Ambler River quadrangle, Alaska: U. S. Geological Survey Open-File Report 78-120 I, scale 1:250,000, 1 sheet.

Tourtelot, Elizabeth B., 1970, Selected annotated bibliography of minor-element content of marine black shales and related sedimentary rocks, 1930-65: U. S. Geological Survey Bulletin 1293, 118 pages.


### AREAS MENTIONED IN TEXT