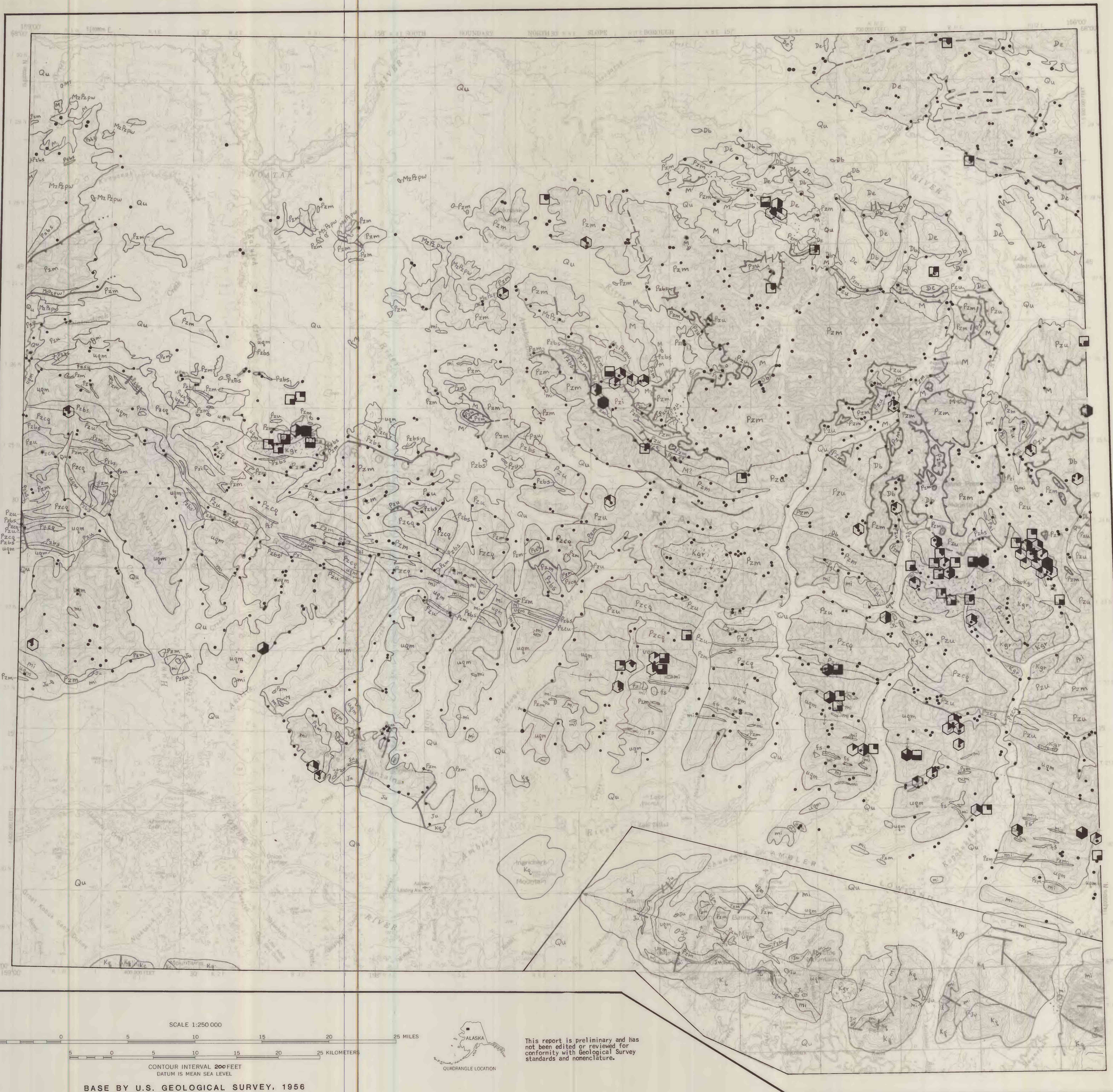
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT 78 - 120D

FOLIO OF THE AMBLER RIVER QUADRANGLE, ALASKA

ELLERSIECK- LEAD AND ZINC 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

ALASKA

QUADRANGLE LOCATION

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

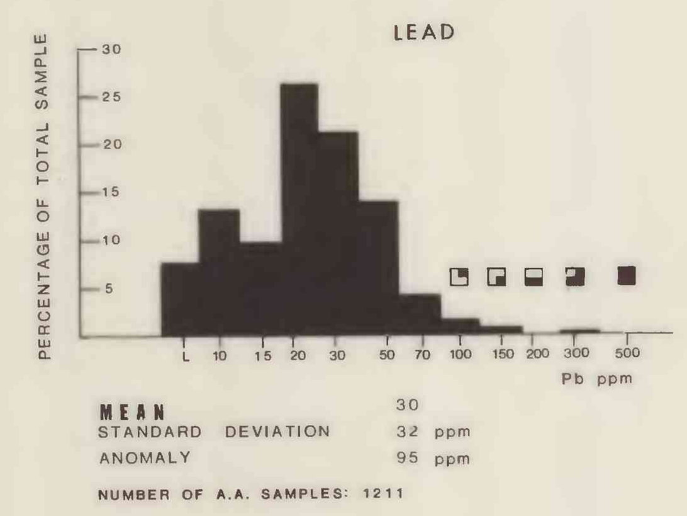
MAP SHOWING LEAD AND ZINC STREAM-SEDIMENT GEOCHEMICAL ANOMALIES, AMBLER RIVER QUADRANGLE, ALASKA

BY INYO ELLERSIECK

1978

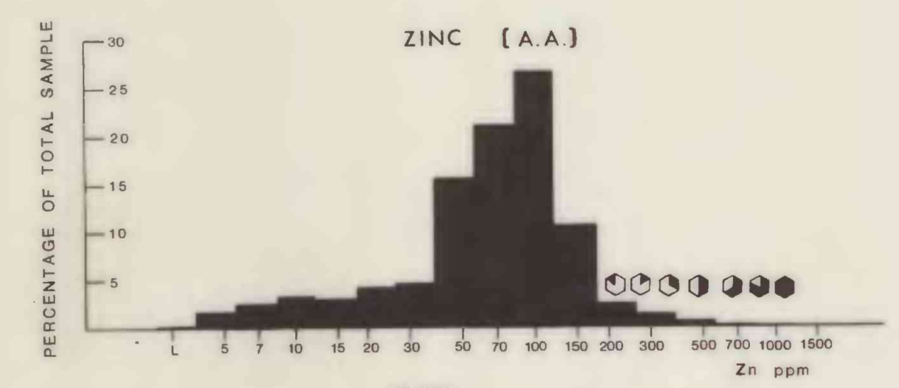
Background information to this folio is published as U. S. Geological Survey Circular 793, available free of charge from the U. S. Geological Survey, Reston, Va. 22092.

EXPLANATION OF ANOMALY SYMBOLS



MEAN 30
STANDARD DEVIATION 32 ppm
ANOMALY 95 ppm

NUMBER OF A.A. SAMPLES: 1211



87 PPM
STANDARD DEVIATION 88 PPM
ANOMALY 263 PPM

NUMBER OF S.Q.S. SAMPLES: 1198

L - LOWER LIMIT OF ANALYTICAL METHOD

EXPLANATION FOR GENERALIZED GEOLOGIC MAP

CORRELATION OF MAP UNITS

SURFICIAL DEPOSITS

Qu } QUATERNARY

SEDIMENTARY AND METASEDIMENTARY ROCKS

Kq, Kc } CRETACEOUS

Unconformity

M } MISSISSIPPIAN

Unconformity

De, Db } DEVONIAN

Pzm } DEVONIAN AND OLDER

METASEDIMENTARY ROCKS OF UNCERTAIN AGE

MzPzpw } MESOZOIC OR PALEOZOIC

Pzcq, Pzbs, Pzu } PALEOZOIC

uqm } PALEOZOIC AND OLDER (?)

IGNEOUS AND META-IGNEOUS ROCKS

Kgr } CRETACEOUS

Ju } JURASSIC

mi, fs, 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

Lead

Emission spectrographic and atomic absorbtion analyses for lead in samples from 1976 are often widely divergent (Ellersieck, 1978b). Comparison of the values from both methods with each other, and with other elements usually related to lead abundance, suggests that semi-quantitative emission spectrographic analyses, although less sensitive, are more reliable for the 1976 data set. Atomic absorbtion and spectrographic analyses for other years correlate well with each other. An anomaly threshold is defined as two standard deviations above the mean; for lead, this is 95 parts per million (ppm).

Lead anomalies are scattered in a variety of geologic settings, but the majority are in four associations with rock types and other anomalous elements:

1. Near the northern Kaluich pluton and the northwestern Shishakshinovik pluton, with zinc, molybdenum, silver, beryllium, and tin.

2. In the eastern schist belt, with zinc, copper, silver, nickel, cobalt, lanthanum, and yttrium.

3. Near black phyllites of map units Db and Pzbs, with zinc, molybdenum, silver, barium, vanadium, and other elements.

4. Near limestone of unit Pzm at Breach Creek (informal name), with zinc.

Zinc

The atomic absorbtion method was used to determine zinc values for this map. Zinc anomalies are closely related to lead anomalies, and are found in the same environments:

1. Near the Kaluich and Shishakshinovik plutons.

2. In the eastern schist belt.

3. Near black phyllites of map units Db and Pzbs. The main concentration of these anomalies is in the headwaters of the Kogoluktuk River, near the eastern boundary of the quadrangle. Zinc and other metals, including lead, are commonly enriched in organic-rich marine shales relative to other sedimentary rocks (Tourtelot, 1970), so many zinc anomalies associated with the black phyllites may represent higher than normal background values in large volumes of rock, rather than concentrated mineral occurrences.

4. Near limestone of unit Pzm at Breach Creek.

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.

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