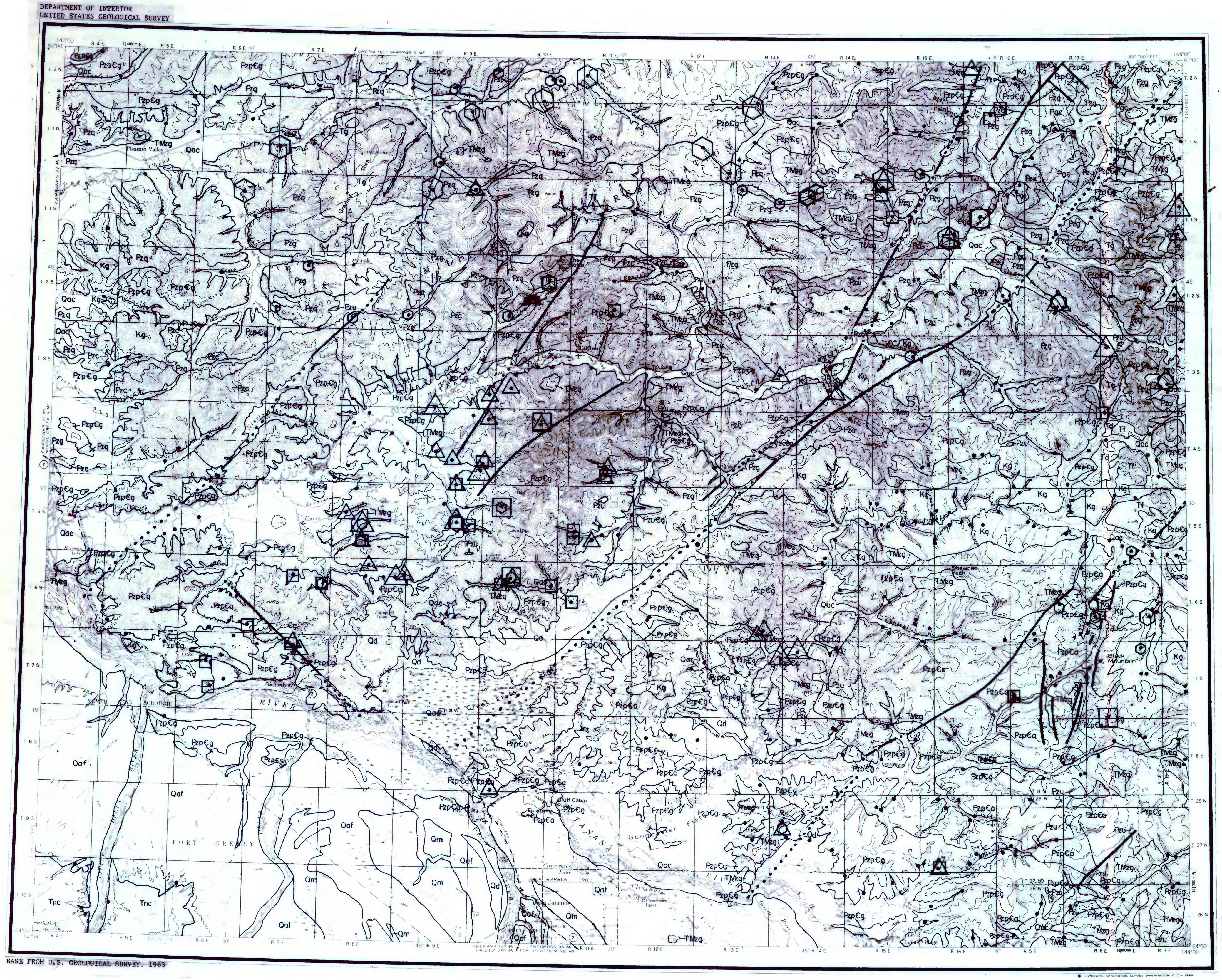
DEPARTMENT OF INTERIOR
UNITED STATES GEOLOGICAL SURVEY



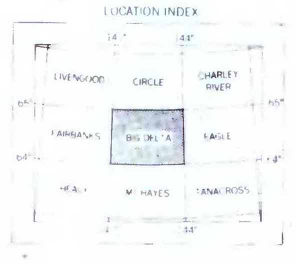
BASE FROM U.S. GEOLOGICAL SURVEY, 1963

SCALE 1:250000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

CONTOUR INTERVAL 200 FEET
DOTTED LINES REPRESENT 100 FOOT CONTOURS
DATUM IS MEAN SEA LEVEL



GEOCHEMICAL MAP SHOWING THE DISTRIBUTION AND ABUNDANCE OF COPPER, LEAD, AND ZINC IN THE OXIDE RESIDUE OF STREAM-SEDIMENT SAMPLES IN THE BIG DELTA QUADRANGLE, ALASKA

BY T. D. HESSIN, P. M. TAUFEN, G. W. DAY, AND M. E. KARLSON

1978

EXPLANATION

GEOLOGY GENERALIZED FROM WEBER, AND OTHERS (1978)

CORRELATION OF MAP UNITS

UNCONSOLIDATED DEPOSITS

Qac, Qaf, Qd, Qm — QUATERNARY

SEDIMENTARY ROCKS

Tnc, Td — TERTIARY

IGNEOUS ROCKS

Tg — TERTIARY

Tf — TERTIARY(?)

TMzg — TERTIARY OR MESOZOIC

Kg — CRETACEOUS

METAMORPHIC ROCKS

Pgc — PERMIAN

Pgc, Pzu, Pzc, Pzg, Pzq — PALEOZOIC

Pzp€a, Pzp€g — PALEOZOIC AND (OR) PRECAMBRIAN

DESCRIPTION OF MAP UNITS

UNCONSOLIDATED DEPOSITS

Qac ALLUVIUM, COLLUVIUM, AND MINOR GLACIAL AND EOLIAN DEPOSITS

Qaf ALLUVIAL FAN AND GLACIAL OUTWASH DEPOSITS

Qd DUNE SAND

Qm MORAINAL DEPOSITS

SEDIMENTARY ROCKS

Tnc NENANA GRAVEL AND COAL-BEARING FORMATION

Td DETRITAL ROCKS

IGNEOUS ROCKS

Tg FELSIC TUFF AND LAVA

Tf GRANITE AND QUARTZ MONZONITE

TMzg UNDIVIDED GRANITIC AND DIORITIC ROCKS

Kg UNDIVIDED GRANITIC AND MINOR DIORITIC ROCKS

METAMORPHIC ROCKS

Pgc GREENSTONE AND CHERT

Pzu ULTRAMAFIC ROCKS

Pzc CATACLASTIC SCHIST AND GNEISS

Pzg GREENSCHIST, QUARTZITE, MARBLE, COARSE META-ARENITE GREENSTONE, AND META-TUFF

Pzq QUARTZITE, SLATE, CALC-PHYLLITE, AND MARBLE

Pzp€a AUGEN GNEISS AND MINOR AMOUNTS OF OTHER GNEISSIC ROCKS

Pzp€g GNEISS, SCHIST, AUGEN GNEISS, AMPHIBOLITE, AND MARBLE

GEOLOGIC SYMBOLS

CONTACT, APPROXIMATELY LOCATED

FAULT OR PROBABLE FAULT, DOTTED WHERE CONCEALED

GEOCHEMICAL SYMBOLS

• SAMPLE SITE--Represents background values at sites where there are no anomalous values

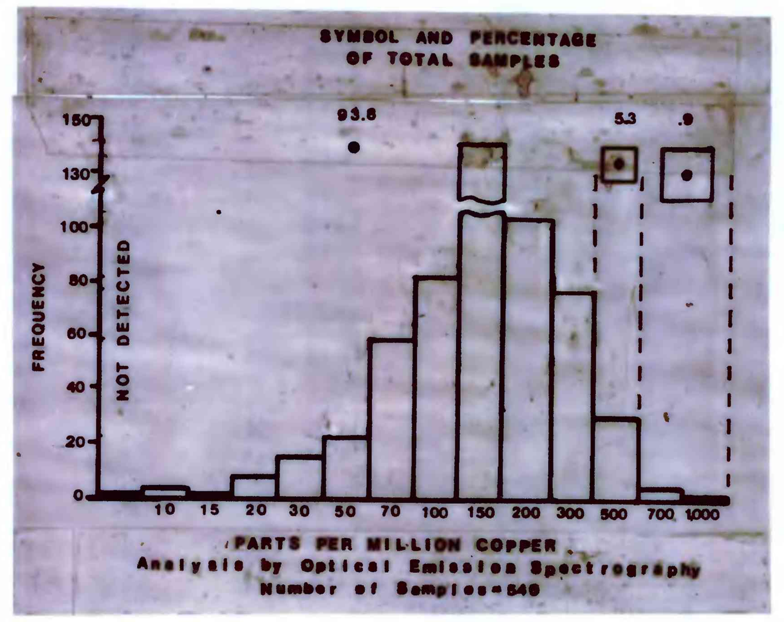
ANOMALOUS VALUES--Explained on histograms

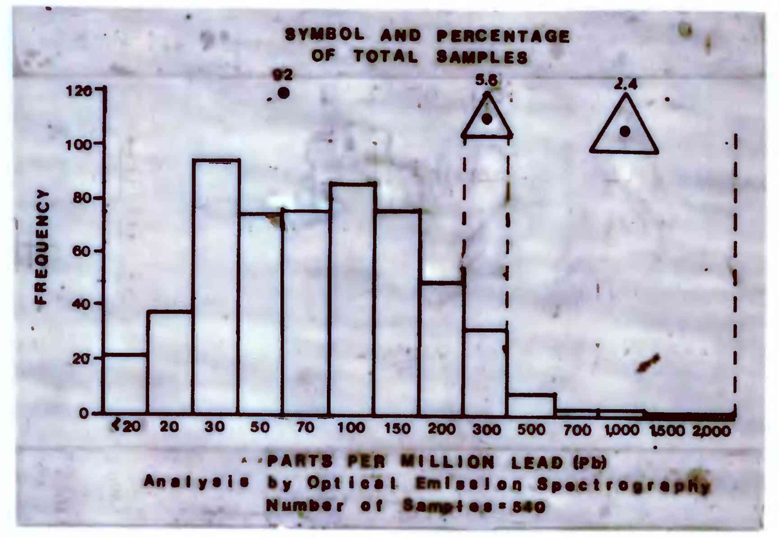
COPPER

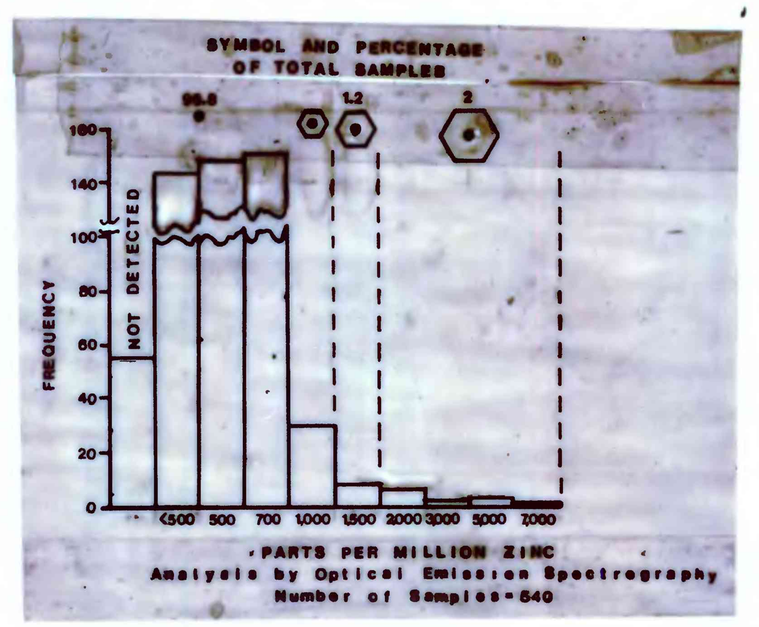
LEAD

ZINC

BACKGROUND INFORMATION RELATING TO THIS MAP IS PUBLISHED AS U.S. GEOLOGICAL SURVEY CIRCUALR 783 AVAILABLE FREE OF CHARGE FROM THE U.S. GEOLOGICAL SURVEY, RESTON, VA. 22092







DISCUSSION

This map shows the distribution and abundance of copper, lead, and zinc in the oxide residue (secondary iron and manganese oxide coatings) of 540 stream-sediment samples collected in the Big Delta quadrangle in 1975 and 1977. This sampling was a part of geochemical studies made for the Alaska Mineral Resource Assessment Program. Stream sediments were collected from the active channels of streams draining areas ranging from approximately 10 to 25 km^2. The areas within the quadrangle that show a low density of sample sites, particularly along the major northeast-trending fault and in the northwestern part of the quadrangle, were areas where dense brush and trees prevented helicopter landings. Areas in the southwestern and south-central parts of the quadrangle were not sampled because they are covered by thick unconsolidated deposits of Quaternary material, which limits effective geochemical sampling within the scope of the present geochemical studies.

The secondary iron and manganese oxide coatings, cement, and particles in stream sediment (denoted as oxide residue) are considered concentrators of elements that have been leached from bedrock and colluvium and are migrating as ions in solution. The oxide residue of stream sediment contains the secondary iron and manganese oxide component of stream sediment together with adsorbed or coprecipitated trace elements and a dilutent of silica and alumina derived from clays. These components are extracted from the -80 mesh sediment using a weak oxalic-acid solution (Alminas and Mosier, 1976). The leachate residue produced by this extraction process is a derivative sample representing one material component of the total stream sediment.

The stream sediments were air-dried and sieved through an 80 mesh (0.2 mm) screen. The oxide residue of the stream sediment was obtained by leaching a 5 gram split of the -80 mesh fraction of the sediment with oxalic acid as described by Alminas and Mosier (1976). This material was analyzed for 19 elements including copper, lead, and zinc by semiquantitative emission spectrography (Grimes and Marranzino, 1968). Map plots and histograms were produced from the analytical results. The range of anomalous values for each element was determined from the histograms and was subdivided into two or more plotting intervals represented by the symbols on the map and histograms.

Complete analytical data for all of the sample sites shown on this map are available in a U.S. Geological Survey Open-File Report by R. M. O'Leary and others (1978).

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