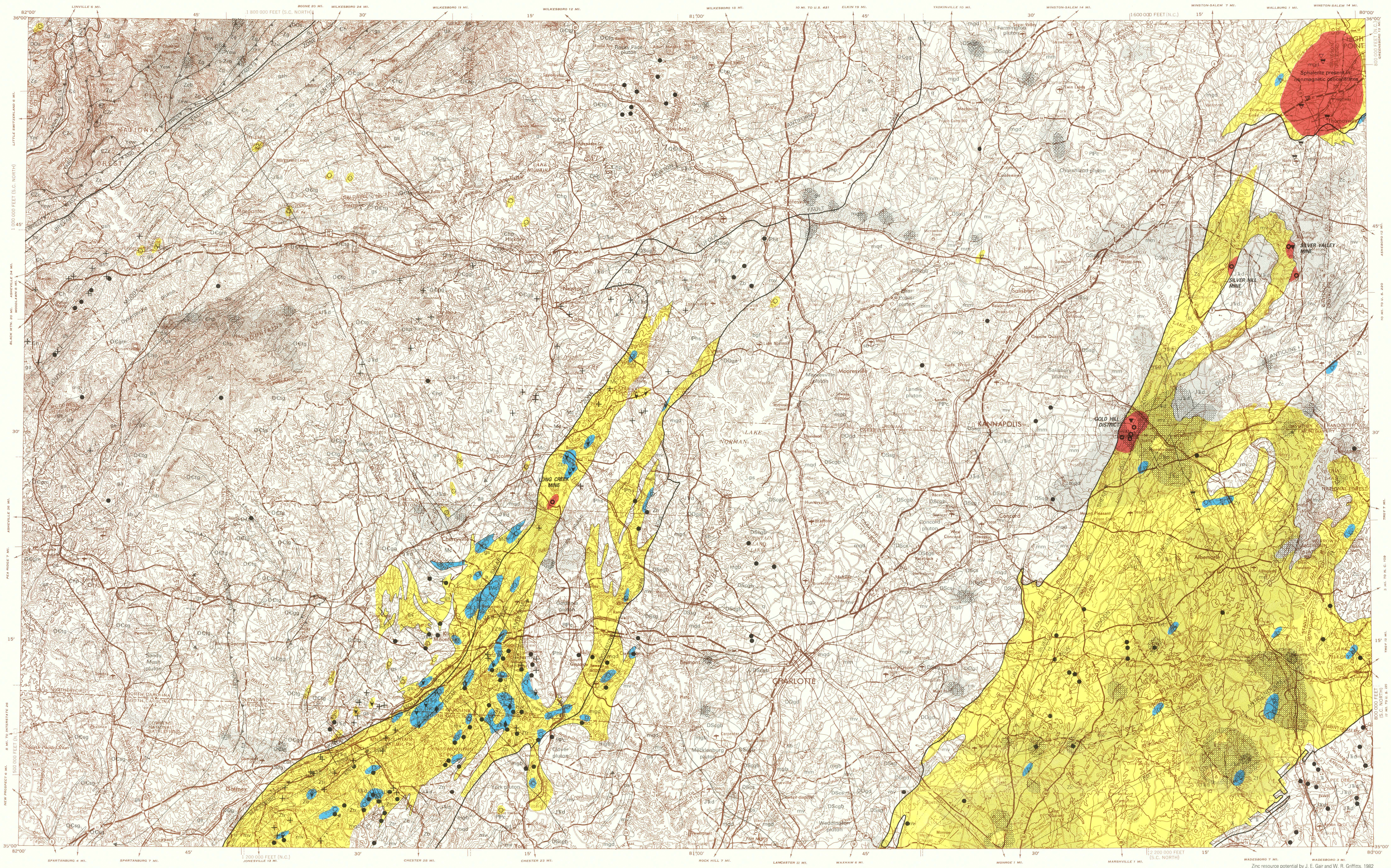


Zinc resource potential by J. E. Gair and W. R. Griffitts, 1982
Geochemical data by W. R. Griffitts and others, 1982

*Map C*—Zinc resource potential

## MAP C—ZINC RESOURCE POTENTIAL

[illegible]

### EXPLANATION FOR MAP C

**Areas of resource potential**—Areas of potential occur both within identified geologically favorable formations and at isolated sites where anomalous geochemical values of known mineral occurrences are not associated with specific geologic formations

- High
- Moderate
- Low

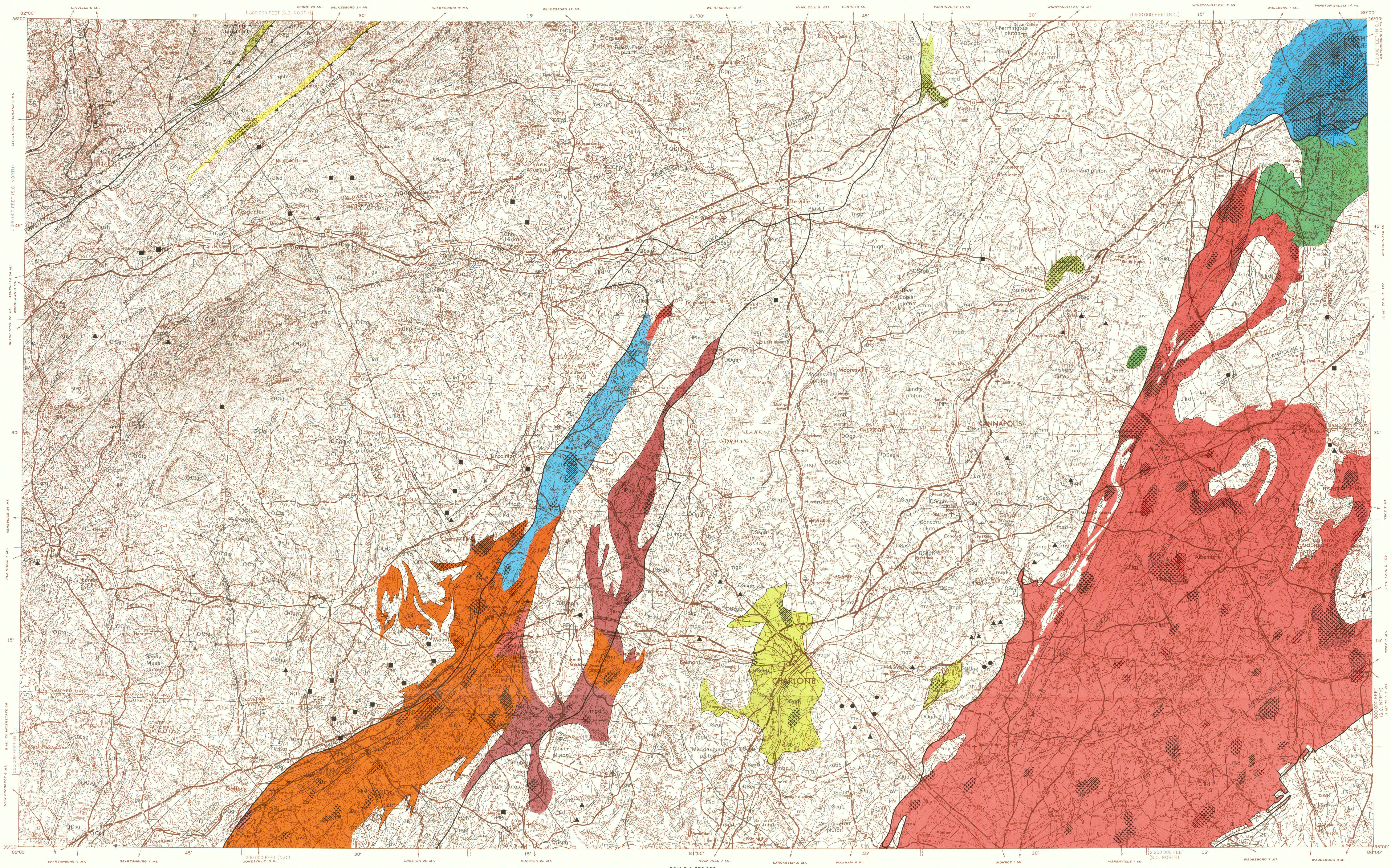
**Areas of anomalous zinc**—Detected in minus 100-mesh fraction of stream-sediment samples collected during National Uranium Resource Evaluation (NURE) (Ferguson, 1979)

- 40–59 ppm zinc
- 60–89 ppm zinc
- ≥90 ppm zinc

**Boundary of major lithotectonic belt**

**Location points**

- Past producer of zinc
- Zinc ≥1500 ppm in magnetic fraction of pan concentrate (at 1 ampere setting of magnetic separator)
- Zinc ≥1000 ppm in nonmagnetic fraction of pan concentrate
- Lead ≥1000 ppm in nonmagnetic fraction of pan concentrate
- Zinc ≥1500 ppm; lead ≥1000 ppm in magnetic fraction of pan concentrate (at 1 ampere setting of magnetic separator)
- Zinc-rich spinel ≥10 percent of pan concentrate; indicates zinc-rich geologic environment that may have potential for zinc resources
- Staurolite; analyzed samples commonly zinc-rich; staurolite-rich areas may have potential for zinc resources
- Zinc ≥1500 ppm in magnetic fraction (1 ampere setting of magnetic separator); staurolite present in pan concentrate
- Zinc ≥1000 ppm in nonmagnetic fraction; staurolite present in pan concentrate



Base from U.S. Geological Survey, 1953
Photorevised 1974
100,000-foot grids based on North Carolina coordinate system and South Carolina coordinate system, north zone

SCALE 1:250 000
5 0 5 10 15 20 25 MILES
5 0 5 10 15 20 25 30 35 KILOMETERS
CONTOUR INTERVAL 100 FEET
WITH SUPPLEMENTARY CONTOURS AT 50 FOOT INTERVALS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA.—1986—G85122
Base-metal resource potential by J. E. Gair and W. R. Griffitts, 1982
Geochemical data by W. R. Griffitts and others, 1982
Geologic base modified from Goldsmith and others (in press)

*Map D*—Base-metal resource potential

## MAP D—BASE-METAL RESOURCE POTENTIAL

Map D combines data from the resource-potential maps for copper, lead, and zinc. The data are presented as an aid in the identification of broad areas which have potential for combined base-metal deposits. In addition, smaller areas are delineated where potential appears to be restricted only to one of the base metals. Although the separate maps for copper, lead, and zinc designate certain areas which have high, moderate, or low potential, this composite map shows the resource potential as either low or moderate to high.

Formations or groups of formations (as mapped by Goldsmith and others, in press) which contain most of the anomalous mineral occurrences and geochemical values relating to base metals are the basis for delineating areas of resource potential. Such formations are assigned a moderate to high potential for base metals in the vicinity of anomalous mineral occurrences or geochemical values, and a low potential everywhere else in the formation. The areas of resource potential are principally in the volcanic-sedimentary rocks of the Carolina slate belt and the metavolcanic and metasedimentary schists of the Kings Mountain belt. No attempt is made on the map to distinguish moderate from high potential because, within any given area, geochemical evidence might indicate moderate potential for one of the base metals (as in the individual resource potential maps for copper, lead, and zinc), but the distribution of mineral deposits might suggest high potential for another of the base metals.

The resource potential for base metals is related either to the major lithotectonic belts or to certain formations within these belts. Copper-lead-zinc deposits of the volcanogenic type are associated with the Carolina slate belt. Vein-type, copper-lead deposits are associated with certain plutons and other igneous rock bodies in the Charlotte belt and with a zone along a branch of the Fries thrust fault in the northwest part of the quadrangle. Lead-zinc resource potential near the northeast corner of the quadrangle is associated with a body of metamorphosed granodiorite and is deduced from the presence of sphalerite and anomalous lead and zinc values in pan concentrates from that area (Griffitts and other workers, 1984). Lead-zinc potential in a schist unit in the northern part of the Kings Mountain belt is suggested by two former gold mines where lead and zinc were by-products, and by anomalous amounts of lead or zinc in pan concentrates. Copper-zinc potential in the southern part of the Kings Mountain belt and in adjacent granitic/granodioritic bodies of the Inner Piedmont and Charlotte belts is indicated by copper-bearing vein deposits that have been mined and by copper and zinc anomalies in pan concentrates. The map also shows isolated areas which have base-metal potential and sites of scattered high geochemical values for the base metals which do not have a resource potential assigned to them.

The volcanogenic, essentially stratabound and syngenetic sulfide deposits of the Carolina slate belt have been the major sources of base metals in the quadrangle. Ninety-five percent or more of all past production has come from these deposits, but, compared to national production, the amount of metal which was produced has been low: about 1,200 tons of copper, 138 tons of zinc, and 98 tons of lead (DeYoung and others, in press). The Carolina slate belt has the greatest potential in the quadrangle for additional deposits of base metals; small areas of moderate potential, however, are widely distributed in the metasedimentary and metavolcanic schists of the Kings Mountain belt, despite the insignificant production of base metals from this belt.

### EXPLANATION FOR MAP D

**Areas of resource potential**—Patterned areas indicate moderate to high potential. Absence of pattern indicates low potential

- Copper
- Lead
- Zinc
- Copper and lead
- Copper and zinc
- Lead and zinc
- Copper, lead, and zinc

**Boundary of major lithotectonic belt**

**Single samples with high base-metal content**

- ▲ Copper
- ● Lead
- ■ Zinc

# MINERAL RESOURCE POTENTIAL FOR COPPER, LEAD, ZINC AND COMBINED BASE METALS IN THE CHARLOTTE 1° x 2° QUADRANGLE, NORTH CAROLINA AND SOUTH CAROLINA

By
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1986