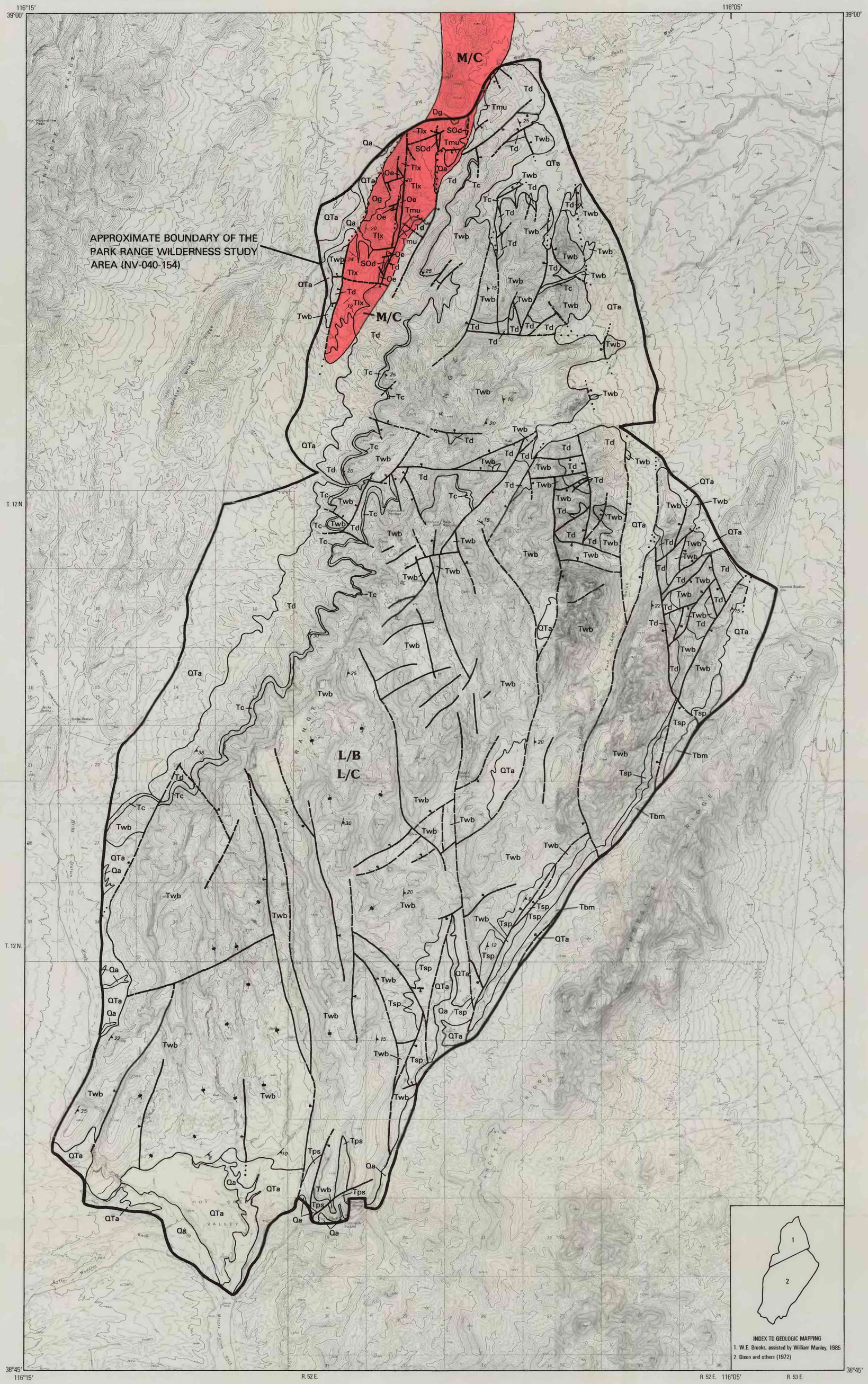
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

BULLETIN 1731-F
PLATE 1



Base from U.S. Geological Survey, 1:24,000
Park Mountain, Pritchards Station,
Red Ring Mountain, and Summit Station

APPROXIMATE MEAN DECLINATION, 1968

SCALE 1:50 000

CONTOUR INTERVAL 20 AND 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

NEVADA

EXPLANATION OF MINERAL RESOURCE POTENTIAL

- **M/C** — Geologic terrane having moderate mineral resource potential for gold, silver, arsenic, and mercury, with certainty level C
- **L/B** — Geologic terrane having low mineral resource potential for oil and gas, with certainty level B
- **L/C** — Geologic terrane having low mineral resource potential for all metals, except as noted above, and geothermal energy, with certainty level C

CORRELATION OF MAP UNITS

Qa	Holocene	QUATERNARY
QTa	Pleistocene, Pliocene, and Miocene	
Tbm	Miocene and Oligocene	
Tsp		
Twb / Tc / Tps	Oligocene	TERTIARY
Td		
Tmu		
Tlx		
Dg	Upper and Middle Devonian	DEVONIAN
SOd		SILURIAN AND ORDOVICIAN
Oe	Middle Ordovician	ORDOVICIAN
Og	Lower Ordovician	

DESCRIPTION OF MAP UNITS

Qa — **Younger alluvium (Holocene)**—Silt, sand, and gravel in major drainages. Thickness 0–50 ft

QTa — **Older alluvium and sheetwash deposits (Pleistocene, Pliocene, and Miocene?)**—Poorly sorted sand, gravel, and boulders on slopes and in upland basins. Thickness from 0 ft to as much as 1,200 ft east of the study area

Tbm — **Bates Mountain Tuff (Miocene and Oligocene)**—Rhyolitic ash-flow tuff, moderately welded, gray to pink-orange. Phenocrysts of quartz, feldspar, and biotite. Abundant pumice. Sanidine K-Ar (potassium-argon) date of 22.8±0.9 Ma (Sargent and McKee, 1969) and 25.1±1.0 Ma (Marvin and others, 1973) also suggests an Oligocene age. Thickness 0–150 ft

Tsp — **Shingle Pass Tuff (Oligocene)**—Rhyolitic ash-flow tuff, nonwelded to moderately welded at base. Light-pink to pale-red with phenocrysts of quartz, feldspar, biotite, and minor hornblende. Sanidine and biotite K-Ar date of 25.1±1.0 Ma (Sargent and McKee, 1969). Thickness 0–200 ft

Twb — **Windous Butte Formation (Oligocene)**—Quartz latitic to rhyolitic ash-flow tuff, moderately to densely welded. Commonly orange to orange brown and contains abundant smoky-gray quartz phenocrysts (2–3 mm (millimeters)), biotite, plagioclase, sanidine, and trace of hornblende and pyroxene. Dark-gray basal vitrophyre is present in places. Several K-Ar biotite and sanidine dates from the Windous Butte Formation in different localities yield a mean date of 30.7±0.6 Ma (Gromme and others, 1972), somewhat younger than K-Ar date of 32.3±1.0 Ma given for samples from the nearby Antelope Range (Hose, 1983). Thickness as much as 1,800 ft

Tc — **Tuff of Cottonwood Canyon (Oligocene)**—Rhyolitic ash-flow tuff, moderately to densely welded. Gray to tan, with abundant 0.5–1-mm bronze biotite phenocrysts. Other phenocrysts include quartz, plagioclase, sanidine, and minor hornblende and pyroxene. Sparse lithic fragments are present. Found at base of Windous Butte Formation in places. Thickness 0–80 ft

Tps — **Tuff of Pritchard's Station (Oligocene)**—Quartz latitic to rhyolitic, ash-flow tuff, moderately welded. Light gray to grayish pink and has phenocrysts of quartz, sanidine, plagioclase, biotite, and minor pyroxene. Andesitic lithic fragments are common throughout; perlitic pumice is conspicuous at top of unit. Limited exposures in southern part of map area. Thickness 0–200 ft

Td — **Intermediate lavas, undivided (Oligocene)**—Andesitic lavas, commonly black, dark gray, or red brown. As many as four flows are present, each characterized by variable abundance and size of plagioclase (0.5–3 mm) and pyroxene (2 mm) phenocrysts; fine grained to porphyritic. Rare pumiceous pyroclastic interbeds are present but were not mapped. Thickness 0–500 ft

Tmu — **Mulligan Canyon Rhyolite (Oligocene)**—Rhyolite, mainly in altered outcrops that are commonly pink, pale gray, or tan. Phenocrysts, where present, include bronze mafic minerals (0.5 mm) and chalky plagioclase (2–3 mm). More altered outcrops appear bone white and spongelike due to coalescence of spaces once occupied by phenocrysts. Where fresh, 0.5–1 mm biotite and 2–3 mm plagioclase phenocrysts are conspicuous. West of the Park Range, in the Antelope Range, bedded pyroclastic debris, breccia blocks, and inward-dipping foliations suggest a possible vent. Thickness may be as much as 400 ft in the Antelope Range (Hose, 1983) but is much thinner, 80 ft, in the Park Range

Tlx — **Sedimentary rocks, undivided (Oligocene?)**—Top part of unit consists of dolomitic breccia, gray to pinkish gray, bedded, coarsening upward with clasts as large as 10 cm (centimeters) but commonly averaging 2–3 cm in a fine-grained dolomitic matrix; underlain by very fine grained to fine-grained shale, tan to brown, with platy partings; underlain by fine-grained volcaniclastic lake sediments with abundant biotite parallel to partings, white to gray; and underlain by basal heterogeneous conglomerate with green and black chert and quartzite (Eureka? Quartzite) clasts. May be silicified near faults. Considered to be the base of the Tertiary section (C.H. Thorman, oral commun., 1985). Thickness 0–200 ft

Dg — **Devils Gate Limestone (Upper and Middle Devonian)**—Limestone, medium gray, laminated to thick bedded, fine grained. May be dolomitic in places; locally fractured, brecciated, and silicified. Thickness undetermined in study area

SOd — **Unnamed dolomite (Silurian and Ordovician?)**—Dolomite, brown to dark gray, medium grained, thin to thick bedded. Considered to correlate, in part, with Silurian Roberts Mountain Formation (Dixon and others, 1972). May contain Early Silurian conodonts (Hose, 1983). Thickness undetermined

Oe — **Eureka Quartzite (Middle Ordovician)**—Quartzite, light gray to white, iron or manganese stained yellow to brown in places, fine to medium grained. Forms a prominent north-trending ridge in northern part of study area. Thickness undetermined

Og — **Goodwin Limestone (Lower Ordovician)**—Limestone or calcareous siltstone, tan to yellowish gray, fine grained, thin to thick bedded. Altered to red jasperoid near Big Fault Wash. Can be divided and mapped as two members outside of wilderness study area (Hose, 1983) but has limited exposure in northern part of Park Range. Thickness undetermined

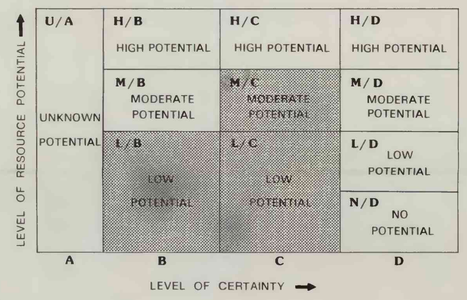
Contact—Dashed where approximately located or inferred

Fault—Dashed where inferred, dotted where concealed; ball and bar on downthrown side

Strike and dip of bedded rocks

Strike and dip of compaction foliation

Strike of vertical joints



LEVELS OF RESOURCE POTENTIAL

- **H** High mineral resource potential
- **M** Moderate mineral resource potential
- **L** Low mineral resource potential
- **U** Unknown mineral resource potential
- **N** No known mineral resource potential

LEVELS OF CERTAINTY

- **A** Available data not adequate
- **B** Data indicate geologic environment and suggest level of resource potential
- **C** Data indicate geologic environment, give good indication of level of resource potential, but do not establish activity of resource-forming processes
- **D** Data clearly define geologic environment and level of resource potential and indicate activity of resource-forming processes in all or part of the area

Diagram showing relationships between levels of mineral resource potential and levels of certainty. Shading shows levels that apply to this study area

MAP SHOWING MINERAL RESOURCE POTENTIAL AND GEOLOGY FOR THE PARK RANGE WILDERNESS STUDY AREA, NYE COUNTY, NEVADA