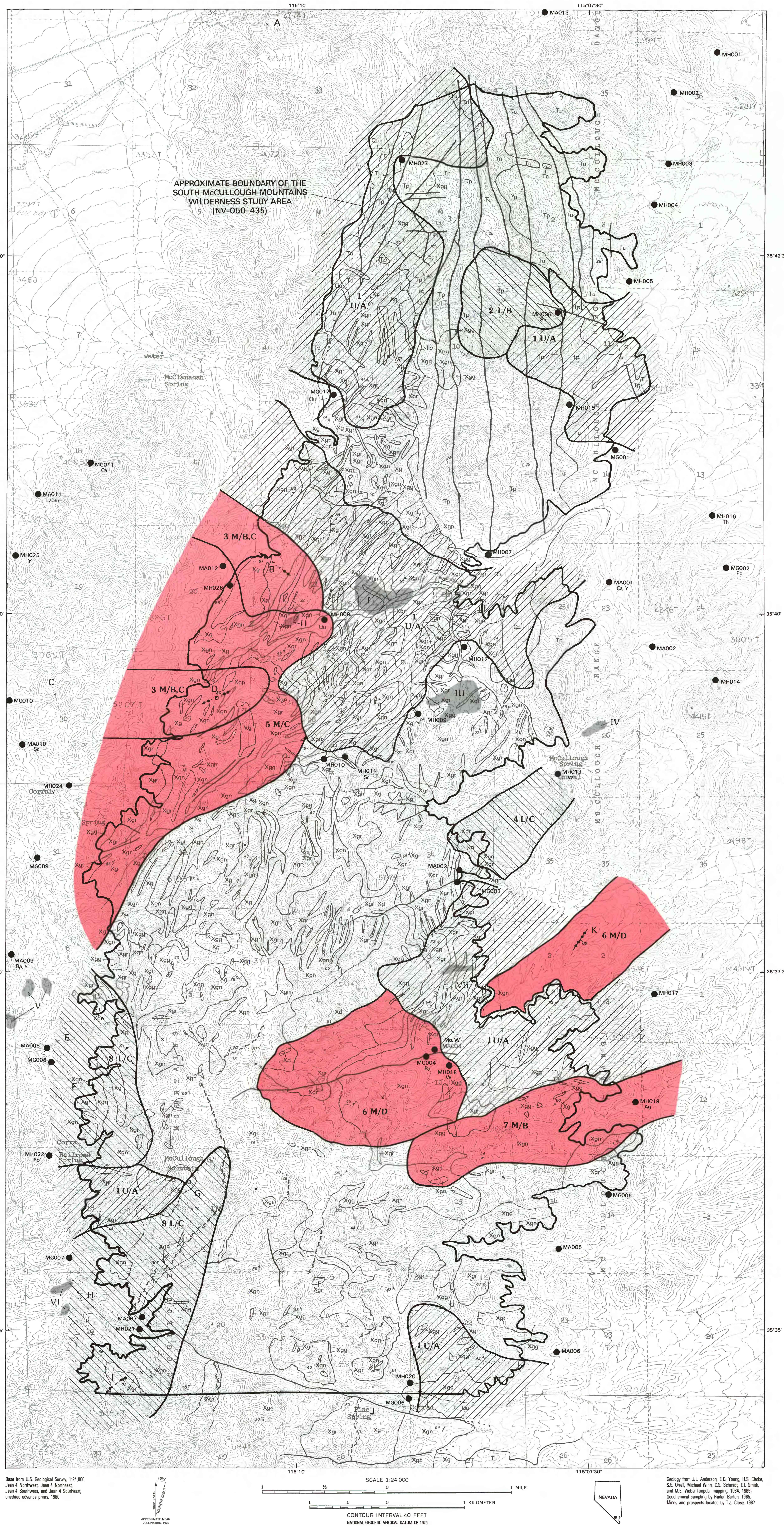

EXPLANATION OF MINERAL RESOURCE POTENTIAL

[No geologic terrane having high mineral resource potential for any commodity was identified by this study. Except as designated below and except for that part covered by Tertiary volcanic rocks, entire area has low mineral resource potential, at certainty level C, for zinc, copper, silver, and gold in medium-size to small stratabound deposits. Same area also has low mineral resource potential, at certainty level C, for niobium, tantalum, uranium, rare-earth elements, thorium, and feldspar and mica in small pegmatite bodies. Same area also has unknown resource potential, at certainty level A, for gold and silver in small to medium-size breccia pipes. Entire study area has low mineral resource potential for sand and gravel, dimension stone, pegmatite minerals (feldspar and mica), and geothermal resources, at certainty level C. Entire study area has no mineral resource potential for oil and gas and coal, at certainty level D]

3 M/B,C / 5 M/C / 6 M/D — **Geologic terrane having moderate resource potential for commodities listed in table below, at certainty level B, C, or D**—Number prefixes refer to areas listed in table below and in table 4

2 L/B / 8 L/C — **Geologic terrane having low resource potential for commodities listed in table below, at certainty level B or C**—Number prefixes refer to areas listed in table below and in table 4

1 U/A — **Geologic terrane having unknown resource potential, at certainty level A**—Number prefixes refer to areas listed below and in table 4

J — **Mineral sites within and adjacent to the study area**

I — **Anomalous area as defined by Landsat Thematic Mapper data**

CORRELATION OF MAP UNITS

Igneous and meta-igneous rocks — Sedimentary and metasedimentary rocks

- Qu — Holocene and Pleistocene — QUATERNARY
- Tu, Tp — Miocene — TERTIARY

Unconformity

- Xgr, Xg, Xd, Xgg, Xgn — Early Proterozoic — PROTEROZOIC

DESCRIPTION OF MAP UNITS

Qu **Surficial units, undivided (Holocene and Pleistocene)**— Unconsolidated silt, sand, and coarser grained sediment in stream washes and erosional remnants of poorly consolidated boulder conglomerate on some slopes of low relief

Tu **Tertiary volcanics, undivided (Miocene)**—Consists of Mount Davis Volcanics in upper part of unit and tuff of Bridge Spring. Mount Davis Volcanics contain black to dark-gray basalt locally interbedded with gray dacite. Tuff of Bridge Spring is a lithic-crystal pyroclastic flow unit composed of an upper unit of poorly welded, lithic-rich white tuff (3–50 ft) as a prominent marker horizon; a thin (as much as 3 ft) middle unit of brick-red welded tuff; and a red-gray basal welded tuff unit (3–30 ft), containing plagioclase, sanidine, biotite, and augite

Tp **Patsy Mine Volcanics (Miocene)**—From bottom to top, consists of 130–490 ft of black, porphyritic basalt containing phenocrysts of olivine, clinopyroxene, and plagioclase. Basalt directly overlies Early Proterozoic units except where locally underlain by waterlaid conglomerate containing clasts of Proterozoic crystalline rocks and Precambrian to Paleozoic quartzite and carbonate units. Basalt overlain by 10–490 ft of interbedded porphyritic basalt and hornblende andesite flows and waterlaid volcaniclastic sandstone and conglomerate. Andesite flows contain large augite and iron-oxide-rimmed oxyhornblende phenocrysts. Uppermost part of section consists of 1–270 ft of gray to black, porphyritic hornblende andesite containing phenocrysts of oxyhornblende, augite, and plagioclase. Interbeds of porphyritic pyroxene andesite and basalt are present north of McCullough Spring

Xgr **Granite and pegmatite (Early Proterozoic)**—Granite is equivalent to biotite monzogranite of McCullough Mountain (Anderson and others, 1985) and is tan, medium grained, weakly foliated, and contains biotite and garnet as mafic phases. Minor muscovite is probably secondary. Microphenocrysts of alkali feldspar (1 cm across; 5–30 volume percent of the rock) are commonly aligned. Round to flattened mafic clots (to 20 cm), rich in biotite and garnet and surrounded by felsic quartzofeldspathic halos, are distinctive and common near contacts with paragneiss (unit Xgn). Pegmatite and minor aplite are present as dikes and sills in all Early Proterozoic units but are particularly abundant near contacts with this granite. Pegmatite contains biotite, muscovite, and minor garnet

Xg **Porphyritic granite (Early Proterozoic)**—Consists of porphyritic monzogranite of Pine Spring, porphyritic monzogranite of McClanahan Spring, and inclusion-rich porphyritic monzogranite of Railroad Spring (Anderson and others, 1985). All granite bodies are tan to gray, medium to coarse grained, moderately to coarsely porphyritic, and mildly to strongly foliated. Northern parts of granite contain numerous inclusions of paragneiss (Xgn) and pegmatite. Alkali feldspar phenocrysts (1–10 cm across, 3–35 volume percent of the rock) resemble augen in deformed parts of granite. Biotite and garnet are principal mafic minerals

Xd **Hornblende quartz diorite and diorite (Early Proterozoic)**—Dark-gray, fine-grained, undeformed augite-hornblende diorite to biotite-hornblende quartz diorite

Xgg **Granitic gneiss and migmatitic leucogranite (Early Proterozoic)**—Reddish, coarse-grained, strongly foliated granitic gneiss contains closely packed alkali feldspar augen (1–2 cm across) and interstitial quartz, plagioclase, biotite, garnet, and minor hornblende. Composition ranges from syenogranite to granodiorite. Migmatitic leucogranite is white, coarse grained to pegmatitic, strongly to moderately foliated, and contains biotite and large (0.5 cm) garnet crystals. Leucogranite is contained within migmatitic parts of paragneiss (unit Xgn)

Xgn **Gneiss, migmatite, paragneiss, and amphibolite (Early Proterozoic)**—Pink to gray, fine-grained to very coarse grained, layered gneiss, migmatite, and paragneiss of granulite metamorphic grade. Strongly foliated and polydeformed. Paragneiss contains quartz, two feldspars, biotite, garnet, cordierite, sillimanite, and accessory hercynite. Gneiss, migmatite, and paragneiss constitute 95 percent of unit. Amphibolite is black to dark green, fine grained, and foliated and consists of plagioclase, hornblende, clinopyroxene, biotite, and minor orthopyroxene and cummingtonite. Amphibolite includes minor metamorphosed ultramafic layers containing hypersthene, actinolitic hornblende, and biotite

Contact—Dashed where approximately located, dotted where concealed, queried where location uncertain

Fault—Dashed where approximately located, dotted where concealed, queried where location uncertain. Bar and ball on downthrown side

40 **Strike and dip of bedding**

76 **Strike and dip of igneous foliation**—Defined by mineral alignment, pegmatitic banding, or inclusion orientation; in part accentuated by superimposed tectonic fabric

84 **Strike and dip of metamorphic foliation**

Mylonitic shear zone

30 54 **Strike and dip of metamorphic mylonitic foliation and bearing and plunge of lineation**—Usually in mylonitic shear zones

80 **Vein**—Dip shown where known

Surface openings

× **Prospect pit**

Adit

Shaft

MH008 **Stream-sediment sample locality and number**—Elements present in slightly anomalous concentrations listed with sample number. See table 2 for concentrations

LEVEL OF RESOURCE POTENTIAL ↑ / LEVEL OF CERTAINTY →

	A	B	C	D
	U/A UNKNOWN POTENTIAL	H/B HIGH POTENTIAL	H/C HIGH POTENTIAL	H/D HIGH POTENTIAL
		M/B MODERATE POTENTIAL	M/C MODERATE POTENTIAL	M/D MODERATE POTENTIAL
		L/B LOW POTENTIAL	L/C LOW POTENTIAL	L/D LOW POTENTIAL
				N/D NO POTENTIAL

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

Summary of areas having metallic mineral resource potential in and adjacent to the South McCullough Mountains Wilderness Study Area, Clark County, Nev.
[Commodities listed in order of relative importance; commodities underlined are considered to be byproducts or trace metals that could be recovered if deposits containing principal metals were mined; where variable sizes of deposits are shown, the most probable size is listed first; size of deposits listed below; <, less than]

Map area (pl. 1 and fig. 2)	Resource potential	Level of potential/ level of certainty (see Appendix for explanation of symbols)	Commodities (listed in order of importance)	Size, type of deposit
All, except numbered areas below and part covered by Tertiary volcanic rocks	Low	L/C	Zn, Cu, Ag, Au	Medium to small, stratabound
	Low	L/C	Nb, Ta, U, REE, Th	Small, pegmatite bodies
	Unknown	U/A	Au, Ag	Small to medium, breccia pipe
1	Unknown	U/A	Au, Ag, Pb,, Cu	Small, vein
	Unknown	U/A	Au, Ag, Pb, Zn, Cu, As	Small, vein or breccia pipe
	Unknown	U/A	La, REE, U, Th, Nb	Medium, carbonatite bodies and dikes
	Unknown	U/A	W, Cu	Small, vein
2	Low	L/B	Sn	Small, vein
3	Moderate	M/C	Ag, Au, Pb, Cu, Zn	Small, vein
	Moderate	M/B	La, REE, U, Th, Nb	Medium, carbonatite bodies and dikes
4	Low	L/C	W, Cu	Small, vein
5	Moderate	M/C	La, REE, U, Th, Nb	Medium, carbonatite bodies and dikes
6	Moderate	M/D	W, Cu	Small to medium, vein
7	Moderate	M/B	Ag, Au	Small, vein or breccia pipe
8	Low	L/C	Cu, Au, Ag, As	Small, vein

Small vein deposit = <10,000 tons
Medium-size vein deposit = 10,000-250,000 tons
Small stratabound deposit = <5 million tons
Medium-size stratabound deposit = 5 million-50 million tons
Small pegmatite deposit = <30,000 tons
Small breccia pipe deposit = <5 million tons
Medium-size breccia pipe deposit = 5 million-20 million tons
Medium-size carbonatite deposit = 5 million-20 million tons

MINERAL RESOURCE POTENTIAL AND GEOLOGIC MAP OF THE SOUTH McCULLOUGH MOUNTAINS WILDERNESS STUDY AREA, CLARK COUNTY, NEVADA