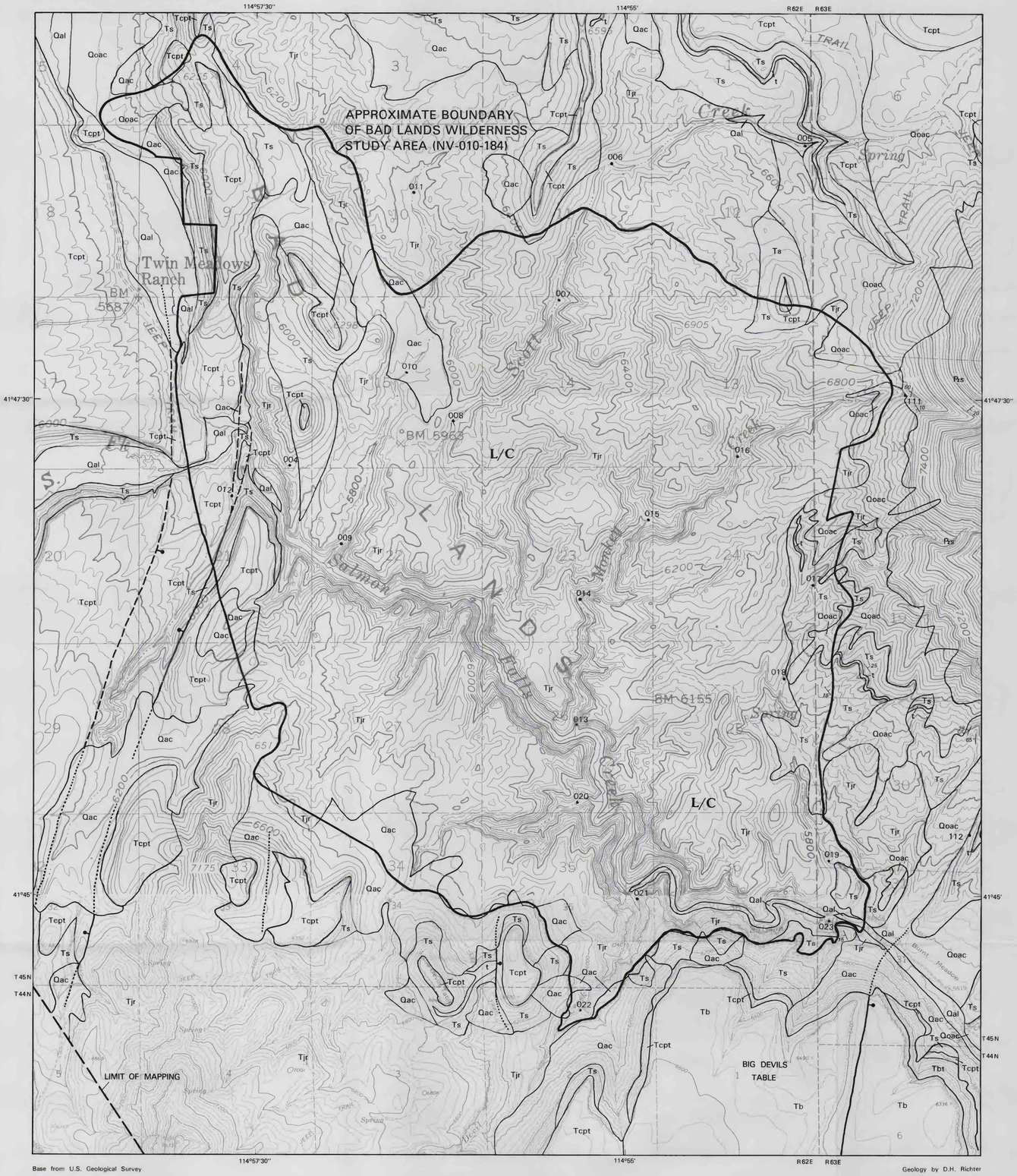
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

BULLETIN 1725-A
PLATE 1



Base from U.S. Geological Survey
Contact, 1957, 1:62,500;
Hubbard Basin, 1968, 1:24,000

Geology by D.H. Richter and B.R. Johnson, 1985

SCALE 1:24 000

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

APPROXIMATE MEAN DECLINATION, 1968

NEVADA

EXPLANATION OF MINERAL RESOURCE POTENTIAL

[No geologic terrane having high or moderate mineral resource potential for any commodity was identified by this study]

L/C **Geologic terrane having low mineral resource potential for metallic minerals and energy resources, with certainty level C**—Applies to entire study area

CORRELATION OF MAP UNITS

Qac, Qal, Qoac	Holocene, Pleistocene	QUATERNARY
Unconformity		
Tb, Tbt, Tcpt, Ts, t, Tjr	Pliocene or Miocene, Miocene	TERTIARY
Unconformity		
Pzs		UPPER PALEOZOIC

DESCRIPTION OF MAP UNITS

Qal **Alluvial deposits (Holocene)**—Alluvium in channels of perennial streams and in large washes; unlithified, silt- to boulder-size clasts (rock fragments); larger clasts are rounded; moderately well sorted. Maximum thickness probably less than 5 m

Qac **Alluvial and colluvial deposits, undivided (Holocene and Pleistocene)**—Chiefly talus and other slope debris mixed with alluvium from numerous small streams; unlithified, silt- to boulder-size clasts; larger clasts are subangular to subrounded; poorly sorted. Maximum thickness probably less than 5 m

Qoac **Older alluvial and colluvial deposits, undivided (Pleistocene)**—Chiefly large alluvial fans and debris flows mixed with talus and slope debris; unlithified, silt- to boulder-size clasts chiefly of Paleozoic sedimentary rocks; poorly to moderately well sorted. Deposits occur mostly on the east side of the study area, where they occur high on the west slope of L & D Mountain; deposits also mantle the extensive exposures of Cougar Point Welded Tuff (Tcpt) along the west edge of the study area, but are not shown on the map. Maximum thickness probably less than 10 m

Basalt flows and tuffs (Pliocene or Miocene)—Forms cap-rock to most of Big Devils Table, south of the study area

Tb **Lava flows**—Medium- to dark-gray, massive flows having vesicular tops and bottoms and crude columnar jointing. Rock is sparsely porphyritic, containing small phenocrysts of olivine (trace to 1 percent, as much as 1.5 mm in diameter) and plagioclase (1–2 percent, as much as 2 mm in diameter) in a fine-grained, intergranular groundmass of plagioclase and augite; augite grains are optically continuous for as much as 5 mm; locally contains irregular vesicles bounded by crystal faces. Individual flows as much as 30 m thick; maximum thickness of unit approximately 65 m

Tbt **Lapilli tuff**—Brownish-gray to yellowish-brown, bedded pyroclastic deposits consisting almost entirely of basaltic lapilli and block-size cinder and scoria; larger blocks and bombs associated with sag structures. Maximum thickness approximately 100 m

Tcpt **Cougar Point Welded Tuff (Miocene)**—Medium- to brownish-gray, reddish-gray weathering, densely welded ash-flow tuff exhibiting crude columnar jointing. Tuff is generally platy and lavalike; contains abundant conspicuous gas cavities, as much as 10 cm long, that are filled locally with vapor-phase quartz and feldspar; locally well developed compaction foliation; pumice clasts are extremely flattened; a hydrated, dark-gray to black, massive to brecciated vitrophyre (glass) occurs at the base of the tuff. Rock is crystal poor to moderately crystal rich, containing phenocrysts of quartz (as much as 10 percent; rounded, fractured, and veined with microcrystalline quartz), sanidine (as much as 7 percent; rounded, fractured, and veined with microcrystalline quartz), plagioclase (as much as 5 percent, not fractured), and rare, small clinopyroxene and opaque minerals in a slightly devitrified, brecciated, glassy matrix. Ash flow is apparently a single cooling unit; thickness ranges from 5 to 65 m

Ts **Sedimentary and pyroclastic rocks (Miocene)**—Consists largely of weakly indurated and very poorly exposed basin-fill sedimentary rock; lithology is chiefly very light gray tuffaceous sandstone, light-tan, massive mudflow deposits, and pebble to cobble conglomerate. Tuffaceous sandstone consists almost entirely of fine- to medium-grained glassy ash in thin beds (1–5 cm thick) that are normally graded and locally crossbedded; they probably represent fluvial reworked air-fall material; conglomerate contains rounded to subangular clasts chiefly of Paleozoic sedimentary rock and appears to be concentrated along the east side of the map area. Maximum thickness of basin-fill deposits approximately 180 m

t **Ash-flow tuff**—A subunit of the sedimentary and pyroclastic rocks consisting of brownish-gray, glass-rich, welded ash-flow tuff ranging from 2 to 10 m thick; crystal poor, containing small (less than 0.2 mm in diameter) crystals of quartz and plagioclase in a glassy shard matrix. All tuffs labeled "t" on the map may not be the same cooling unit

Tjr **Jarbidge Rhyolite (Miocene)**—Reddish-gray, crystal-rich, flow-banded rhyolite containing coarse phenocrysts of quartz (as much as 10 percent, rounded, as large as 6 mm in diameter), plagioclase (as much as 5 percent, euhedral, as large as 3 mm in diameter), sanidine (as much as 7 percent, rounded and embayed, as large as 4 mm in diameter), and traces of sphene, opaque minerals, and altered clinopyroxene in a cryptocrystalline groundmass consisting chiefly of potassium feldspar. Dark-gray perlitic vitrophyre locally common; massive flow breccia present in some places. Base not exposed; maximum exposed thickness about 200 m

Pzs **Sedimentary rocks, undivided (Paleozoic)**—Sequence consists of a lower unit of thinly laminated detrital limestone and an upper unit of thinly bedded siliceous rocks including siltstone, mudstone, argillite, and chert-argillite (very siliceous argillite). The two lithic types are interbedded in the contact zone; limestone beds are sporadically present throughout the upper, siliceous unit. No fossils were observed in the lower, limestone unit; deep-water-facies Late Mississippian brachiopods and clams (Thomas Dutro, written commun., 1986) are fairly common in the upper unit. Both units display evidence of turbidite origin, graded beds, and sole marks; both would probably be assigned to the transitional facies, the slope environment between shelf and basin. The lower unit resembles the Lower Mississippian Tripon Pass Limestone of Oversby (1973), which is exposed just north of Wells, Nev.; the upper unit resembles part of the Schoonover sequence (Miller and others, 1984), which is exposed in the northern Independence Mountains, north of Elko, Nev.

——— **Contact**—Approximately located

High-angle fault—Approximately located; dashed where inferred; dotted where concealed. Bar and ball on downthrown side

Strike and dip of bedding

Geochemical sample locality and number

LEVEL OF RESOURCE POTENTIAL ↑ / LEVEL OF CERTAINTY →	A	B	C	D
U/A	H/B HIGH POTENTIAL	H/C HIGH POTENTIAL	H/D HIGH POTENTIAL	
UNKNOWN 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

MAP SHOWING MINERAL RESOURCE POTENTIAL, GEOLOGY, AND GEOCHEMICAL SAMPLE LOCALITIES FOR THE BAD LANDS WILDERNESS STUDY AREA AND VICINITY, ELKO COUNTY, NEVADA