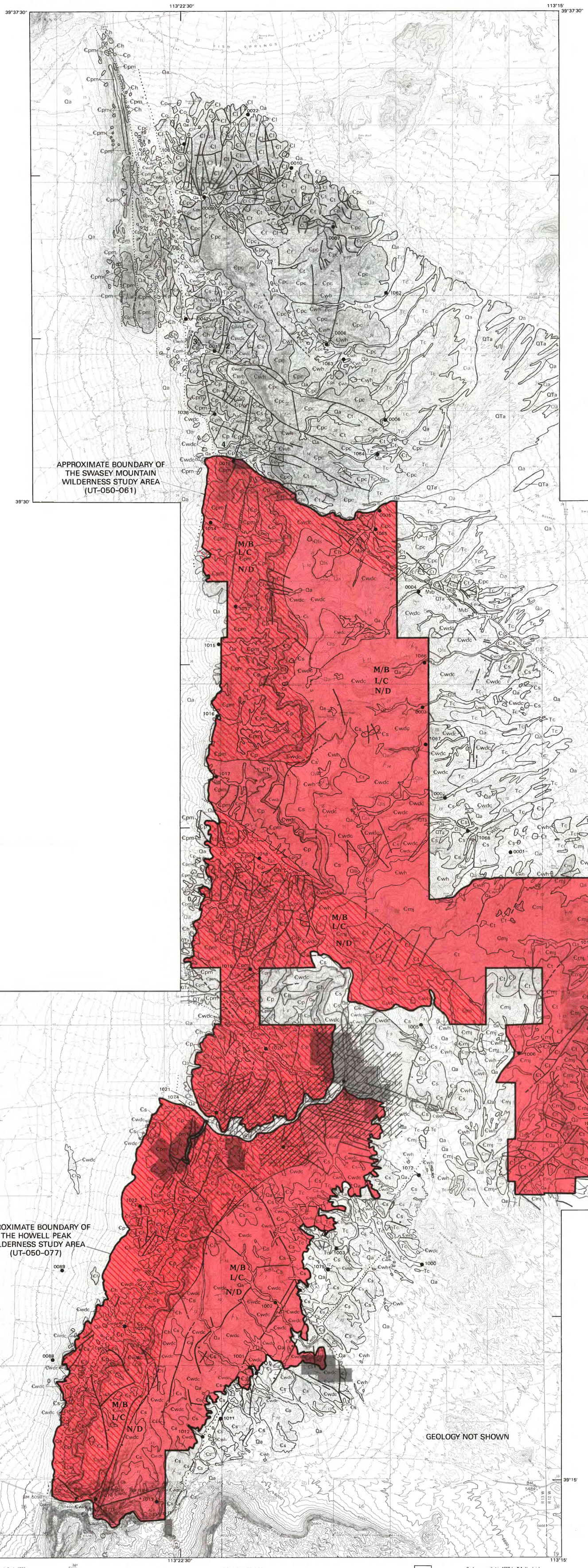

Base from U.S. Geological Survey 1:62,500 Notch Peak, 1960; 1:24,000 Sand Pass and Sand Pass SE, 1967; and 1:24,000 Marjum Pass, Swasey Peak, Swasey Peak SW, Whirlwind Valley SW, and Whirlwind Valley NW, 1972

APPROXIMATE MEAN DECLINATION, 1975

SCALE 1:50 000

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

UTAH

Geology compiled in 1986 by R.A. Yambrick, U.S. Geological Survey, from Hintze (1980a,b; 1981a,b,c)
Prospects mapped in 1986 by U.S. Bureau of Mines

EXPLANATION OF MINERAL RESOURCE POTENTIAL AND IDENTIFIED RESOURCES

[Both study areas contain inferred subeconomic resources of high-purity limestone (Howell Limestone, Unit Ꞓh), quartzite (Prospect Mountain Quartzite, unit Ꞓpm), sand and gravel (in washes and along flanks), and fossils (in the Wheeler Shale, unit Ꞓwh, and Marjum Formation, unit Ꞓmj). Both study areas have moderate mineral resource potential for high-purity limestone and dolomite, with certainty level B, except for the Prospect Mountain Quartzite, the Howell Limestone, and units of Tertiary and Quaternary age]

M/B — **Geologic terrane having moderate mineral resource potential for lead, zinc, copper, molybdenum, silver, and gold, with certainty level B**

M/B — **Geologic terrane having moderate energy resource potential for oil and gas, with certainty level B**—Applies to entire study areas

L/C — **Geologic terrane having low resource potential for geothermal energy, with certainty level C**—Applies to entire study areas

N/D — **Geologic terrane having no resource potential for coal, with certainty level D**—Applies to entire study areas

CORRELATION OF MAP UNITS

Qa	Qls		QUATERNARY
QTa			QUATERNARY AND TERTIARY
Tc		Miocene and Oligocene	TERTIARY
Ta	Ti	Oligocene(?)	TERTIARY
Unconformity			
Mzb			MESOZOIC(?)
Unconformity			
Ꞓo		Upper Cambrian	CAMBRIAN
Ꞓl		Upper Cambrian	CAMBRIAN
Ꞓt		Upper Cambrian	CAMBRIAN
Ꞓmj		Middle Cambrian	CAMBRIAN
Ꞓpc		Middle Cambrian	CAMBRIAN
Ꞓwh		Middle Cambrian	CAMBRIAN
Ꞓs		Middle Cambrian	CAMBRIAN
Ꞓwdc		Middle Cambrian	CAMBRIAN
Ꞓh		Middle Cambrian	CAMBRIAN
Ꞓp		Lower Cambrian	CAMBRIAN
Ꞓpm		Lower Cambrian	CAMBRIAN

DESCRIPTION OF MAP UNITS

Qa — **Alluvium (Quaternary)**—Ranges from coarse gravel deposits on alluvial fans near mountains to silt in valley bottoms; includes shoreline and other deposits of Lake Bonneville; thickness unknown

Qls — **Landslide deposits (Quaternary)**—Blocks of Dome Limestone and Marjum Formation on underlying shale formations; on slopes of Swasey Peak; thickness unknown

QTa — **Older alluvium (Quaternary and Tertiary)**—Coarse gravel deposits on high-level dissected surfaces of alluvial fans; thickness unknown

Tc — **Conglomerate, tuffaceous sandstone, and limestone (Miocene and Oligocene)**—East side of Swasey Mountain (Hintze, 1980b, 1981a, 1981b), conglomerate and tuffaceous sandstone, interbedded; southeast of Dome Canyon, interbedded conglomerate, breccia, tuff, and limestone (Hintze, 1981c). Includes older conglomerate of Skull Rock Pass (Hintze, 1980b), composed of boulders of Ordovician Eureka Quartzite and Ordovician and Silurian dolomites; older conglomerate overlies latitic ash-flow tuff of Red Knolls of Oligocene age (informal unit of Morris, 1987) at Red Knolls. Possibly as much as 300 m thick

Ta — **Altered sedimentary rocks (Oligocene?)**—Silicified, iron-stained, and brecciated carbonate rocks; includes jasperoid (Chidsey, 1978); only large occurrences shown

Ti — **Quartz latite (Oligocene?)**—Small plugs and dikes, rhyolitic to quartz latitic, intrude faults south of Sand Pass (Chidsey, 1978; Hintze, 1980a); altered, abundant muscovite locally; resembles late Eocene and Oligocene intermediate-composition rocks of Thomas Range and Drum Mountains (Lindsey, 1982)

Mzb — **Breccia and mylonite (Mesozoic?)**—Breccia and mylonite of broken and recrystallized Paleozoic carbonate rocks along North Swasey and Trail Canyon tear faults

Ꞓo — **Orr Formation (Upper Cambrian)**—Composed of five members (listed in descending order): Sneakover Limestone Member, medium- to light-gray limestone (100 ft thick); Corset Spring Shale Member, green shale with lesser thin beds of limestone (40 ft thick); Johns Wash Limestone Member, medium- to dark-gray limestone, cliff-forming (200 ft thick); Candland Shale Member, interbedded olive-gray shale and dark-gray fossiliferous limestone (150 ft thick); Big Horse Limestone Member, dark-gray, cliff-forming limestone containing oolite and calcarenite (550 ft thick)

Ꞓl — **Lamb Dolomite (Uper Cambrian)**—Composed of interbedded light- and dark-gray cliff-forming dolomite; basal part contains abundant pisolites; about 800 ft thick

Ꞓt — **Trippe Limestone (Middle Cambrian)**—Upper part is Fish Springs Member, consisting of thin-bedded nodular limestone and intraformational conglomerate (130–300 ft thick); lower member consists of gray, massive, cliff-forming dolomite (450–600 ft thick)

Ꞓmj — **Marjum Formation (Middle Cambrian)**—Dark-gray, thin-bedded limestone, dolomitic toward top; extends from Swasey Peak south; about 1,200 ft thick

Ꞓpc — **Pierson Cove Formation (Middle Cambrian)**—Dark-gray, mottled dolomitic limestone, massive and unfossiliferous; forms prominent cliffs above Wheeler Shale; approximately equivalent facies of the Marjum Formation; restricted to northeast part of Swasey Mountain; about 1,200 ft thick

Ꞓwh — **Wheeler Shale (Middle Cambrian)**—Fissile, calcareous shale, yellow-gray weathering, with *Elrathia* in upper part and abundant agnostid trilobites in lower part; about 450–590 ft thick

Ꞓs — **Swasey Limestone (Middle Cambrian)**—Medium-gray, unfossiliferous cliff-forming limestone; 120–150 ft thick

Ꞓwdc — **Whirlwind Formation, Dome Limestone, and Chisholm Formation, undivided (Middle Cambrian)**—Whirlwind Formation consists of basal shaly limestone, middle ledge-forming limestone, and upper shaly limestone containing abundant *Ehmaniella* (about 160 ft thick); Dome Limestone is gray, unfossiliferous, and cliff-forming (140–220 ft thick); Chisholm Formation consists of (from bottom to top) olive-gray shale and interbedded pisolitic limestone, dark-gray oncolitic limestone, and olive-gray shale interbedded with thin-bedded limestone (180–230 ft thick)

Ꞓh — **Howell Limestone (Middle Cambrian)**—Massive cliff-forming limestone, composed of unnamed upper member of light-gray limestone (220–310 ft thick) and Millard Member of dark-gray oncolitic limestone (210 ft thick)

Ꞓp — **Pioche Formation (Middle and Lower Cambrian)**—Upper part composed of Tatow Member (Middle Cambrian), containing limestone as well as same lithology as lower member (170 ft thick); and unnamed lower member (Lower Cambrian) of brown quartzite interbedded with green shale and siltstone (420 ft thick)

Ꞓpm — **Prospect Mountain Quartzite (Lower Cambrian)**—Pink and gray, brown-weathering quartzite separated by silty partings and crossbedded; upper 2,000 ft exposed

Contact—Hachures indicate contact mapped by Hintze (1980a,b; 1981a,b,c) as attenuation faults but here interpreted as intrastratal solution of formation shown above contact

Fault—Dashed where approximately located; dotted where concealed; bar and ball on downthrown side; arrows indicate direction of inferred strike-slip movement

10 **Strike and dip of bedding**

1067 **U.S. Geological Survey geochemical sample locality**—Showing number

1 **Anomaly determined from Landsat Thematic Mapper data**

Lode claims

Placer claims

Shaft—Abandoned

× **Prospect**

LEVEL OF RESOURCE POTENTIAL ↑	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

LEVEL OF CERTAINTY →

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 these study areas

MINERAL RESOURCE POTENTIAL, IDENTIFIED RESOURCES, GEOLOGY, GEOCHEMICAL SAMPLE LOCALITIES, MINING DATA, AND LANDSAT ANOMALIES, SWASEY MOUNTAIN AND HOWELL PEAK WILDERNESS STUDY AREAS, MILLARD COUNTY, UTAH