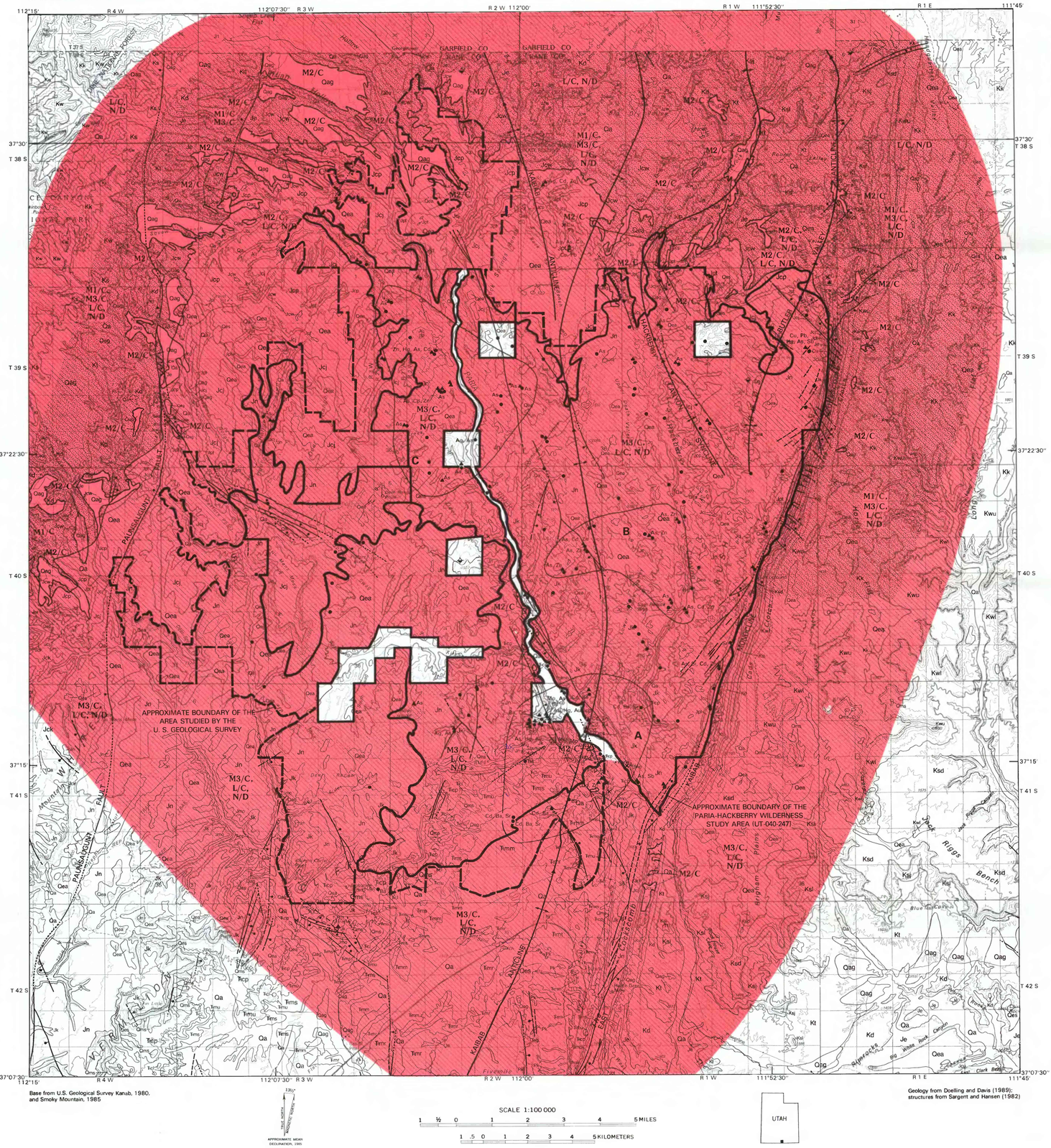
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

BULLETIN 1748–B
PLATE 1



Base from U.S. Geological Survey Kanab, 1980, and Smoky Mountain, 1985

Geology from Doelling and Davis (1989); structures from Sargent and Hansen (1982)

SCALE 1:100 000

1 ½ 0 1 2 3 4 5 MILES

1 .5 0 1 2 3 4 5 KILOMETERS

UTAH

EXPLANATION OF MINERAL RESOURCE POTENTIAL

M1/C Geologic terrane having moderate mineral resource potential for gypsum in the Carmel Formation, at certainty level C

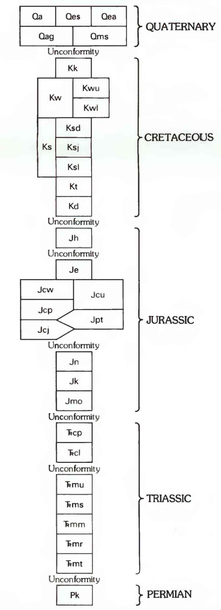
M2/C Geologic terrane having moderate mineral resource potential for sand and gravel, at certainty level C

M3/C Geologic terrane having moderate mineral resource potential for oil and gas, at certainty level C—Applies to the entire study area

L/C Geologic terrane having low resource potential, at certainty level C, for geothermal resources and for all metals and nonmetals—Applies specifically to gold, uranium, silver, arsenic, antimony, barium, strontium, zinc, cadmium, mercury, copper, and manganese. Applies to the entire study area

N/D Geologic terrane having no energy research potential for coal, at certainty level D—Applies to the entire study area

CORRELATION OF MAP UNITS



LIST OF MAP UNITS

Qa **Stream sediment (Quaternary)**—Unconsolidated alluvium, mostly sand and silt

Qes **Eolian sand (Quaternary)**

Qea **Mixed eolian sand and alluvial sand (Quaternary)**

Qag **Alluvial gravel (Quaternary)**—Includes deposits in streams and on terraces and pediments

Qms **Mass wasting deposits (Quaternary)**—Includes colluvium, landslide deposits, and talus

Kk **Kaiparowits Formation (Cretaceous)**—Mostly fine and silty sandstone with sparse interbeds of mudstone and rare limestone beds

Wahweap Formation (Cretaceous)—Mudstone with fine to silty sandstone grading to cliff-forming sandstones:

Kwu **Upper member**

Kwl **Lower member**

Ks **Straight Cliffs Formation (Cretaceous)**—Cliff-forming sandstone and mudstone with interlayered carbonaceous shale and coal:

Ksd **Drip Tank Member**

Ksj **John Henry Member**—Contains principal coal-bearing units

Ksl **Lower member**

Kt **Tropic Shale (Cretaceous)**—Soft gray shales with rare thin bentonite beds

Kd **Dakota Sandstone (Cretaceous)**—Thin-bedded sandstone with lignite to subbituminous coal

Jh **Henrieville Formation (Jurassic)**—Flat-bedded sandstone, shale, siltstone, and claystone

Je **Entrada Sandstone (Jurassic)**

Carmel Formation (Jurassic)—Cliff-forming sandstone, red marine sandstone, limestone, and gypsum beds:

Jcw **Wiggler Wash Member**

Jcu **Upper member**

Jcp **Paria River Member**

Jcj **Judd Hollow Tongue**

Jpt **Thousand Pockets Tongue of Page Sandstone (Jurassic)**

Jn **Navajo Sandstone (Jurassic)**—Massive, cliff-forming sandstone

Jk **Kayenta Formation (Jurassic)**

Jmo **Moenave Formation (Jurassic)**

Chinle Formation (Triassic):

Tcp **Petrified Forest Member**—Variegated clay-rich rocks

Tcl **Shinarump Member**—Lenticular sandstone and conglomerate

Moenkopi Formation (Triassic)—Mostly red mudstone and sandstone:

Tmu **Upper red member**

Tms **Shnabkaib Member**

Tmm **Middle red member**

Tmr **Lower red member**

Tmt **Timpoweap Member**

Pk **Kaibab Limestone (Permian)**

Contact

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

Anticline—Arrows show dip and direction of plunge

Syncline—Arrows show dip and direction of plunge

Shaft

Adit

Mine or prospect pit

Oil and gas test hole—Abandoned (located only by section)

Show of oil and (or) gas

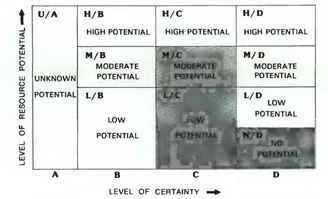
Dry hole

Sample site

Stream sediment (including heavy-mineral concentrate)—Values (in parts per million) considered anomalous are Ag, 5; As, 8; Ba, 1000; Cd, 0.3; Hg, 0.26; Sr, 5000

Rock—Values (in parts per million) considered anomalous are Ag, 5; As, 10; Au, 0.1; Bi, 3; Cd, 1.8; Cu, 200; Hg, 0.1; Mo, 10; Pb, 500; Sb, 6; Zn, 700

Area having clustered anomalous samples



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.

REFERENCES

Doelling, H.H., and Davis, F.D., 1989, The geology of Kane County, Utah—Geology, mineral resources, geologic hazards: Utah Geological and Mineral Survey Bulletin 124 and Map 121, 192 p., 10 pls., scale 1:100,000.

Sargent, K.A., and Hansen, D.E., 1982 [1983], Bedrock geologic map of the Kaiparowits coal-basin area, Utah: U.S. Geological Survey Miscellaneous Investigations Series Map I–1033–I, scale 1:125,000.

GEOLOGY, MINERAL RESOURCE POTENTIAL, DRILL HOLES, AND SELECTED SAMPLE SITES, PARIA-HACKBERRY WILDERNESS STUDY AREA AND VICINITY, KANE COUNTY, UTAH