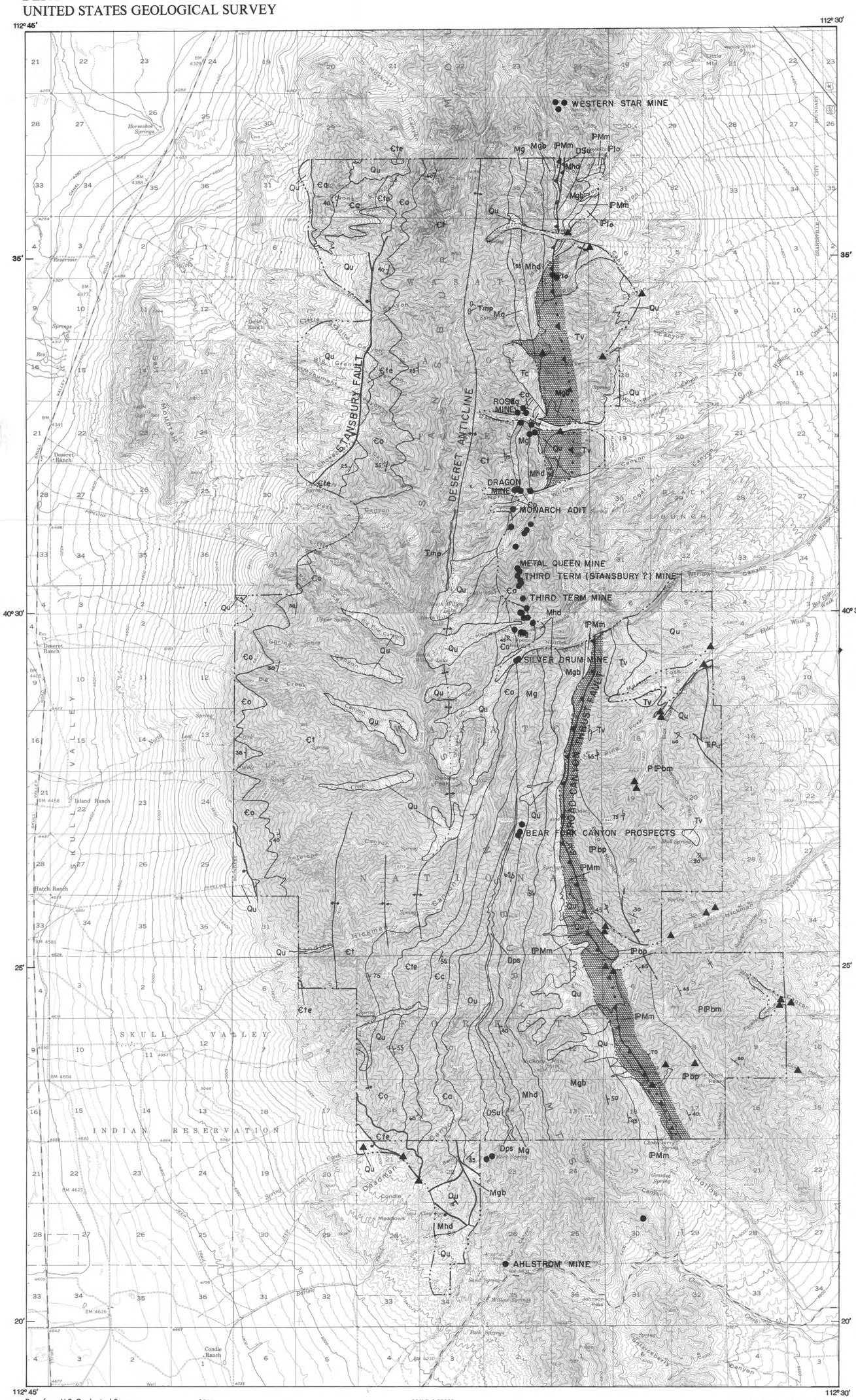
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1353-C



MINERAL RESOURCE POTENTIAL MAP OF THE STANSBURY ROADLESS AREA, TOOELE COUNTY, UTAH

By

Martin L. Sorensen and Richard F. Kness
U.S. Geological Survey U.S. Bureau of Mines

1983

EXPLANATION

ZONE WITH LOW TO MODERATE POTENTIAL FOR COPPER, LEAD, AND SILVER MINERALIZATION

SAMPLE LOCALITIES

- ● U.S. Bureau of Mines
- ▲ U.S. Geological Survey

CORRELATION OF MAP UNITS

Qu	Holocene and Pleistocene	QUATERNARY
Unconformity		
Tv, Tmp, Tc	Oligocene or Eocene; Paleocene(?)	TERTIARY
Unconformity		
₹Pu	Lower Triassic and Upper Permian	TRIASSIC AND PERMIAN
PPbm	Lower Permian and Upper Pennsylvanian	PERMIAN AND PENNSYLVANIAN
PPbp	Middle Pennsylvanian	PENNSYLVANIAN
PPlo	Lower Pennsylvanian	
PPMm	Lower Pennsylvanian and Upper Mississippian	PENNSYLVANIAN AND MISSISSIPPIAN
Mgb	Upper Mississippian	MISSISSIPPIAN
Mhd		
Mg	Lower Mississippian	
Dps	Upper Devonian	DEVONIAN
Unconformity		
DSu	Upper, Middle, and Lower Ordovician	DEVONIAN AND SILURIAN
Ou	Upper Cambrian	ORDOVICIAN
€a	Upper and Middle Cambrian	
€c	Middle Cambrian	CAMBRIAN
€te	Middle and Lower Cambrian	
€o	Lower Cambrian	
€t		

DESCRIPTION OF MAP UNITS

Qu	SURFICIAL DEPOSITS, UNDIVIDED (QUATERNARY)
Tv	VOLCANIC ROCKS (TERTIARY)
Tmp	MONZONITE PORPHYRY (TERTIARY)
Tc	CONGLOMERATE (TERTIARY)
₹Pu	SEDIMENTARY ROCKS, UNDIVIDED (TRIASSIC AND PERMIAN)--Thaynes Limestone, Woodside, Phosphoria, and Park City Formations, Diamond Creek Sandstone, and Kirkman Limestone
	OQUIRRH GROUP
PPbm	BINGHAM MINE(?) FORMATION (PERMIAN AND PENNSYLVANIAN)
PPbp	BUTTERFIELD PEAKS FORMATION (PENNSYLVANIAN)
PPlo	LOWERMOST PART OF OQUIRRH GROUP (PENNSYLVANIAN)
PPMm	MANNING CANYON SHALE (PENNSYLVANIAN AND MISSISSIPPIAN)
Mgb	GREAT BLUE LIMESTONE (MISSISSIPPIAN)
Mhd	HUMBUG FORMATION AND DESERET LIMESTONE, UNDIVIDED (MISSISSIPPIAN)
Mg	GARDISON LIMESTONE (MISSISSIPPIAN)
Dps	PINYON PEAK LIMESTONE AND STANSBURY FORMATION, UNDIVIDED (DEVONIAN)
DSu	DOLOMITIC ROCKS, UNDIVIDED (DEVONIAN AND SILURIAN)--Simonson(?), Sevy(?), and Laketown Dolomites
Ou	SEDIMENTARY ROCKS, UNDIVIDED (ORDOVICIAN)--Fish Haven Dolomite, Kanosh Shale, and Garden City Formation
€a	AJAX DOLOMITE (CAMBRIAN)
€c	CARBONATE ROCKS, UNDIVIDED (CAMBRIAN)--Dunderberg Shale, and Opex Formation, Cole Canyon and Bluebird Dolomites, Bowman and Herkimer Limestones, and Dagmar Dolomite
€te	TEUTONIC LIMESTONE (CAMBRIAN)
€o	OPHIR GROUP OF RIGBY (1958) (CAMBRIAN)
€t	TINTIC QUARTZITE (CAMBRIAN)

MAP SYMBOLS

- CONTACT
- FAULT--Dashed where approximately located. Bar and ball on downthrown side
- THRUST FAULT--Dotted where concealed. Sawteeth on upper plate
- FOLDS--Showing axial trace. Dotted where concealed
  - Anticline
  - Syncline
- STRIKE AND DIP OF BEDS
  - Inclined
  - Vertical
  - Overturned
- BOUNDARY OF ROADLESS AREAS

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral resource potential survey of the Stansbury Roadless Area in the Wasatch National Forest, Tooele County, Utah. Stansbury Roadless Area was classified as a recommended wilderness during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979. The area was subsequently divided into recommended wilderness (A4757) and further planning (D4757) areas by presidential action, April 16, 1979. This map and accompanying report describe the mineral resource potential of the further planning area (D4757).

STANSBURY ROADLESS AREA

In April 1979, the Stansbury Roadless Area was divided into two areas: area A4757 (recommended wilderness) and area D4757 (further planning). The geologic map of the Stansbury Roadless Area (Sorensen, 1982a) covers both areas A4757 and D4757. The geochemical map of the Stansbury Roadless Area covers only area D4757. This report is an assessment of the mineral resource potential of area D4757 only, because of its status as a further planning area. Area A4757 and areas adjacent to the entire roadless area are mentioned in this evaluation of area D4757 because consideration of the surrounding terrane helps to determine the mineral resource potential.

SUMMARY

The U.S. Bureau of Mines and the U.S. Geological Survey have conducted a survey to determine the mineral resource potential of the eastern part (D4757) of the Stansbury Roadless Area, Tooele County, Utah. The results of this survey indicate that most of the study area has a low potential for mineralization. There is a low to moderate potential for copper, lead, and silver mineralization in area D4757 adjacent to and west of the Broad Canyon thrust fault. Limestone and dolomite are exposed over a large part of the roadless area forming a major mineral resource of untested value. No geothermal resources are known within the area. Oil and gas potential cannot be evaluated without extensive geophysical exploration and exploratory drilling, beyond the scope of this study.

GEOLOGY

The Stansbury Mountains are underlain by approximately 30,000 ft of Paleozoic sedimentary rocks (Sorensen, 1982a). The lower part of the section consists of approximately 10,100 ft of quartzite, limestone, dolomite, shale, and sandstone of Early Cambrian through Devonian age. A Late Devonian angular unconformity separates these rocks from the rest of the Paleozoic section, which consists of approximately 20,000 ft of limestone, shale, sandstone, and quartzite of Devonian through Permian age. Mesozoic limestone, sandstone, dolomite, and siltstone occur in a small area on the east flank of the Stansbury Mountains. Tertiary latite flows and waterlain tuffs occur in the foothills east and west of the range. Sills and small plugs of Tertiary monzonite porphyry occur near the crest of the range north of Deseret Peak. Tertiary and Quaternary surficial deposits underlie the lower foothills and the valleys east and west of the range.

The Deseret anticline is the dominant geologic structure in the Stansbury Roadless Area. Lower Cambrian quartzite exposed in the anticlinal core forms the crest and most of the west flank of the range. Rocks as young as Early Pennsylvanian are exposed on the east flank of the fold. The west limb of the fold is terminated by the Stansbury fault, a recently active normal fault. The east limb of the anticline terminates along the trace of the Broad Canyon thrust fault which was active during late Mesozoic or early Tertiary time; the fault dips west and underlies all of the Stansbury Mountains with the exception of the eastern foothills.

GEOCHEMISTRY

Spectrographic analyses reporting 31 elements have been made for heavy-mineral concentrates of 29 stream-sediment samples collected mainly from streams that drain area D4757 (Sorensen, 1982b). Gold is not reported in any of the analyses; silver is reported in one analysis at 0.7 ppm; copper has a high value of 300 ppm and a mean value of 28 ppm; and lead has a high value of 70 ppm and a mean value of 16 ppm. Examination of the analyses does not suggest the existence of any undiscovered mineral deposits.

MINES AND PROSPECTS

Most of the mines and prospects in or near the Stansbury Roadless Area occur within a narrow north-trending zone, bordered on the west by the Late Devonian unconformity and on the east by the Broad Canyon thrust fault. All of the workings in or near the roadless area are abandoned and caved or covered, and all are inactive.

The Stansbury Roadless Area includes most of the Third Term and a small part of the Free Coinage mining districts (fig. 1). The Third Term mining district, originally called the Grantsville mining district, was organized June 15, 1875, for claims reporting lead, silver, and copper (Butler and others, 1920, p. 147, 149). Production is not recorded for any deposits within area D4757. Two claims in the district near the Stansbury Roadless Area have had very limited production over a period of 80 years, with the most recent production in 1950. Mine location records for the period before 1885 were not available in the Tooele County courthouse.

The Free Coinage mining district was organized May 29, 1895, to include claims for clay and limestone (Butler and others, 1920, p. 146). Later claims in the district have been filed for silver, lead, zinc, and mercury. Five claims in the mining district north of the Stansbury Roadless Area have had a very limited production over a period of 25 years with the most recent production in 1942.

Several canyons along the east flank of the range near the central part of area D4757 have been extensively prospected. The Mining Fork of South Willow Canyon and Davenport, North Willow, and South Willow Canyons, together with intervening areas, contain most of the mines in or near the roadless area and include 33 adits, 26 pits, and 3 shafts. The Western Star mine, comprising two adits, is approximately 0.75 mi north of the roadless area. The Ahlstrom mine adit and another shaft are approximately 1 mi and 3 mi east, respectively, of the southern spur of the roadless area.

The U.S. Bureau of Mines has examined the mines and prospects in and near the roadless area. The results of fire-assay and spectrographic analyses for 125 samples collected near the north, east, and south margins of the roadless area are summarized below.

Metal	No. samples containing metal	Grade: Highest	Grade: Average
Copper	73	1 %	0.08 %
Gold	3	0.04 oz/ton	0.018 oz/ton
Lead	70	13 %	0.52 %
Silver	69	7.4 oz/ton	0.6 oz/ton
Zinc	18	7.5 %	0.93 %

All of the "highest value" samples are from localities outside of roadless area D4757. None of the samples collected from within the roadless area appears to have any economic significance.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

The following criteria were considered for this assessment: structure and stratigraphy of potential host rocks, ore minerals or ore-related minerals suggested by rock or stream-sediment analyses, patterns of alteration associated with ore deposits, ore minerals in outcrop, aeromagnetic data, and history of economic ore deposits in similar nearby geologic settings. Using these criteria, the metallic-mineral resource potential of an area can be classified as high, moderate, or low. A high resource potential requires that the geologic criteria be generally favorable and that there be a nearby deposit that can reasonably be inferred to extend into the study area. A moderate potential also requires generally favorable geologic criteria and suggests that the extension of nearby deposits into the district be less certain. A low resource potential is predicted if most or all of the geologic criteria are unfavorable.

Mines and prospects in and near area D4757 consist of small low-grade subeconomic deposits of copper-, lead-, and silver-bearing minerals. These deposits occur in a narrow north-trending zone that is mainly in the upper plate of the Broad Canyon thrust fault near the Late Devonian unconformity. Because of this pattern of occurrence, tracts within area D4757 that are between Magpie Canyon and Big Hollow Canyon and west of the Broad Canyon thrust, together with a narrow zone east of the thrust, are identified as having a low to moderate potential for copper, lead, and silver mineralization. Results of fire-assay and spectrographic analyses suggest that any near-surface deposits present are small and low grade.

Limestone and dolomite are the principal nonmetallic resources in area D4757. These commodities have been quarried for a number of years at several sites near Flux on State Highway 138. The Great Blue and Deseret Limestones are the best sources for limestone and dolomite, respectively, in area D4757, and underlie approximately 50 acres along the north side of Davenport Canyon and near the head of Magpie Canyon. An extensive program of sampling and testing is needed in order to evaluate this industrial mineral resource. There is no evidence of current or past quarrying operations within the roadless area.

The Utah Geological and Mineral Survey (1980) has designated lands in the northwest corner of area A4757 as prospectively valuable for geothermal resources; however, no geothermal resources are known or included within area D4757 and the potential for such is low.

Oil and gas leases have been issued for approximately 73 acres in the southern spur of the area, near State Highway 199; applications have also been filed for oil and gas leases on approximately 12,800 acres in the eastern and southern spur areas. It is assumed that exploration efforts have tested either the Tertiary basins that flank the Stansburys or Mesozoic strata that may underlie the region at great depth and which elsewhere are productive reservoir rocks. The potential for oil and gas deposits in the Stansbury Roadless Area cannot be determined without an extensive geophysical exploration program.

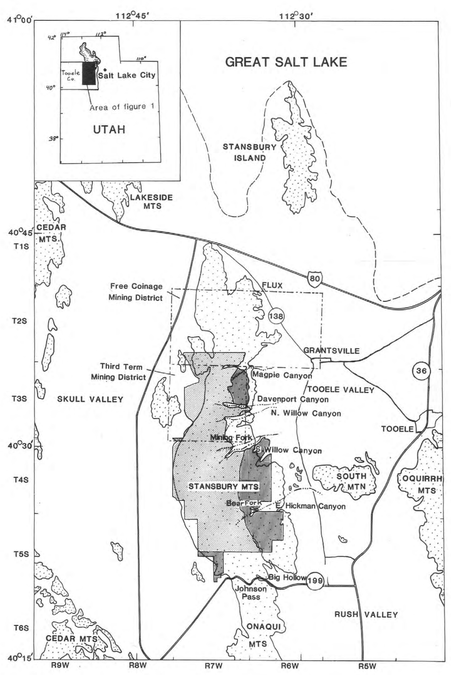
REFERENCES

Butler, B. S., Loughlin, G. F., Heikes, V. C., and others, 1920, The ore deposits of Utah: U.S. Geological Survey Professional Paper 111, 672 p.

Sorensen, M. L., 1982a, Geologic map of the Stansbury Roadless Areas, Tooele County, Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-1353-A, scale 1:62,500.

_____1982b, Map showing geochemical analyses of panned stream sediments, Stansbury Roadless Areas, Tooele County, Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-1353-B, scale 1:62,500.

Utah Geological and Mineral Survey, 1980, Geothermal resources of Utah 1980: scale 1:500,000.



EXPLANATION

- Upland areas
- Stansbury Roadless Area
- Area recommended for wilderness (A4757)
- Areas recommended for further planning (D4757)
- Boundary of mining district

Figure 1.--Index map showing geographic features, mining districts, and location of Stansbury Roadless Area.

Interior—Geological Survey, Reston, Va.—1983

For sale by Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225