



EXPLANATION OF MINERAL RESOURCE POTENTIAL

- Areas having identified resources of gypsum
- Geologic terrane having high resource potential for gypsum, with certainty level C—Applies to entire wilderness study area
- Geologic terrane having moderate mineral resource potential for bismuth, tungsten, lead, and zinc, with certainty level B
- Geologic terrane having low energy resource potential for coal and oil and gas, with certainty level C—Applies to entire wilderness study area
- Geologic terrane having low resource potential for uranium and other metals (except those mentioned above) and geothermal energy, with certainty level B—Applies to entire wilderness study area

CORRELATION OF MAP UNITS

Qal	Holocene	QUATERNARY
QTsp	Pleistocene, Pliocene, and Miocene	
Td	Oligocene	TERTIARY
Kd	Upper Cretaceous	CRETACEOUS
Tc	Upper Triassic	TRIASSIC
Psa	Lower Permian	PERMIAN
Py		
Pa	Upper and Middle Pennsylvanian	PENNSYLVANIAN
Pml		

DESCRIPTION OF MAP UNITS

- Qal Alluvium (Holocene)—Clay, silt, sand, and gravel deposited in major arroyos; locally contains colluvium and dune sand
- QTsp Santa Fe Group (Pleistocene and Miocene) and Palomas Gravel (Pliocene to Pleistocene)—Pebble and cobble pediment gravel in sand and clay matrix; locally cemented by caliche. Unit correlated with Santa Fe Formation and Palomas Gravel
- Td Datil Formation (Oligocene)—Underlies the headwaters of Cañon Agua Buena and a north-trending line of hills in the southeastern part of the map area. The formation trends N to N 10° W, and dips 5°–25° W. Consists of latite and andesite flows, volcanoclastic conglomerate, sandstone, and rhyolite tuff; the dominant color of the volcanic units is purple, and rhyolite ranges from red to light gray. Datil unconformably overlies Upper Triassic Dockum Formation south of Arroyo de las Cañas Ranch
- Kd Dakota Sandstone (Upper Cretaceous)—Light reddish-gray, thin- to thick-bedded, medium-grained sandstone unconformably overlies Dockum Formation. Only one exposure occurs in map area about 1.5 mi southeast of the Arroyo de las Cañas Ranch
- Tc Dockum Formation (Upper Triassic)—Consists of maroon and light-gray, fine- to medium-grained sandstone. Exposed in tilted fault block along headwaters of Arroyo de las Cañas in eastern part of map area. Dockum Formation is mostly concealed by Palomas Gravel, and it lies unconformably on San Andres Limestone south of Arroyo de las Cañas
- Psa San Andres Limestone (Lower Permian)—Consists of dark-gray, thin- to medium-bedded limestone interbedded with a few gray sandstone and gypsum beds. The upper beds have been removed from the mesas and escarpments by erosion. Only beds in the lower 150–250 ft of the Limestone Member occur in the study area, and these lower beds are resistant and form cap rocks on the mesas above cliffs of the basal Gorieta Sandstone Member. Overlies and intertongues with the Gorieta Sandstone
- Pg Gorieta Sandstone Member (Lower Permian)—Consists of white, light-yellow and light-gray, medium- to coarse-grained, crossbedded sandstone; it is a prominent cliff-forming unit below the basal beds of the San Andres Limestone. Unit ranges from about 60 to 120 ft thick. Unit also intertongues with the upper Joyita Sandstone Member of the Yeso Formation
- Py Yeso Formation (Lower Permian)—Consists of an upper Joyita Sandstone Member, the Cañas Gypsum Member, the Torres Member, and the basal Meseta Blanca Member. The units were not mapped separately because they intertongue with each other and their contacts vary widely along strike. The Joyita Sandstone Member is made up of about 30–60 ft of interbedded reddish-orange, buff and yellow sandstone, silty sandstone, siltstone, and minor interbeds of light-gray gypsum. The Cañas Gypsum Member consists chiefly of thick beds of white gypsum interbedded with beds of medium-gray limestone and gypsiferous siltstone. The Cañas Gypsum Member is intertongued with the basal bed of the overlying Joyita Sandstone Member and the upper beds of the underlying Torres Member. Unit is about 130–160 ft thick. The Torres Member makes up a large part of the Yeso Formation and thickness ranges from 450 to 650 ft. It is composed of interbedded reddish-orange to buff sandstone, light-gray to reddish-gray siltstone, gray limestone, and white to light-red gypsum. The limestone beds within the tilted fault blocks form narrow linear ridges that parallel the strike of the beds. Because of faulting and intertonguing of the beds of this unit overlying Cañas Gypsum Member and the underlying Meseta Blanca Sandstone Member, it is difficult to measure the thickness of this unit. The basal Meseta Blanca Sandstone Member is made up mostly of evenly bedded, reddish-brown, variegated sandstone and some light-reddish-brown sandy shale. The lower beds usually form valleys on the back slopes of the underlying Abo Formation; unit is 200–250 ft thick, and it is conformable with the Abo Formation.
- Pa Abo Formation (Lower Permian)—Consists of dark-red sandstone, arkosic sandstone, shale, and conglomerate. Sandstone occurs as crossbedded, ripple-marked lensing beds. Shale erodes easily and forms lower areas between ledges of coarser, resistant sandstone beds. Partial sections of the formation crop out in the northwestern and southwestern parts of the wilderness study area as eastward-dipping fault blocks. A complete section of the formation occurs in the southwestern part of the wilderness study area. Thickness of entire formation ranges from 300–700 ft. The basal beds of the Abo are correlated with the Bursum Formation. Beds equivalent to the Bursum consist of purplish-gray limestone with interbeds of purplish-red and green shale, gray limestone, and arkosic conglomerate. Thickness of Bursum equivalent beds is about 70–100 ft in the southwestern part of the map area. The Bursum equivalent beds may be disconformable(?) or conformable(?) with the underlying Pennsylvanian Madera Limestone Member of the Magdalena Group
- Pml Magdalena Limestone of the Madera Group (Pennsylvanian)—About 200 ft of the upper beds of the arkosic limestone member of the Madera Limestone crop out in cliffs along the Arroyo Tinajas in the northern part of the map area. The limestone is massively bedded, light-gray, and eroded to cliffs and hogbacks

- Contact
- - - Fault showing dip—Dotted where concealed; U, upthrown side; D, downthrown side
- - - Anticline showing trace of crest line—Approximately located
- - - Syncline showing trace of trough line and direction of plunge—Approximately located
- Strike and dip of beds
- Inclined
- Horizontal
- ⊗ Prospect pit
- ⊗ Unpatented mining claim
- ⊗ Oil and gas leases
- Sample locality and number

LEVEL OF RESOURCE POTENTIAL	H/A	H/B	H/C	H/D
	HIGH POTENTIAL	HIGH POTENTIAL	HIGH POTENTIAL	HIGH POTENTIAL
	M/B	M/C	M/D	M/D
	MODERATE POTENTIAL	MODERATE POTENTIAL	MODERATE POTENTIAL	MODERATE POTENTIAL
UNKNOWN POTENTIAL	L/B	L/C	L/D	L/D
POTENTIAL	LOW POTENTIAL	LOW POTENTIAL	LOW POTENTIAL	LOW POTENTIAL
			N/D	N/D
			NO POTENTIAL	NO POTENTIAL
	A	B	C	D
	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 this study area

MAP SHOWING MINERAL RESOURCE POTENTIAL, IDENTIFIED RESOURCES, GEOLOGY, AND GEOCHEMICAL SAMPLE LOCALITIES, SIERRA DE LAS CAÑAS WILDERNESS STUDY AREA, SOCORRO COUNTY, NEW MEXICO