

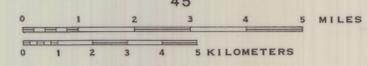
CORRELATION OF MAP UNITS

Qal	Qbt	Quaternary				
QTb	OTpp	OTt	OTtr	Qts	Qtsz	Quaternary and Tertiary
Tz	Tc	Tv	Tertiary			
Kmv	Kmvm	Km	Cretaceous			
Kd	Jm	Jwt	Jurassic			
Je	Rcp	Rca	Triassic			
Pu	Pgy	Pa	Permian			
IPm	pCu	pCgn	Precambrian			

DESCRIPTION OF MAP UNITS

- Qal ALLUVIUM—Mainly valley-fill deposits of recent streams. Deposits generally consist of unconsolidated clay, silt, sand, and gravel with scattered pebbles, cobbles, and boulders; locally includes eolian sand. Thickest in Jemez River valley, probably not more than 100 feet thick
- Qbt BANDELIER TUFF—Predominately light-colored welded ash-flow deposits consisting of rhyolite ash and pumice; present only in eastern part of Cañada de Cochiti Grant
- Qtb BASALT—Lava flows and associated scoriaeous materials on Santa Ana Mesa; probably less than 1,000 feet thick
- OTpp PEDIMENT GRAVEL—Weakly cemented gravel consisting entirely of volcanic rock types north of Santa Ana Mesa and south of Cañada de Cochiti Grant; 50-100 feet thick
- OTt TERRACE GRAVEL—Predominately sandy boulder gravel consisting of clasts of Precambrian rocks and minor amounts of Paleozoic and Mesozoic rocks. Caps hills and ridgetops along western flanks of Sierra Nacimiento; as much as 80 feet thick. Deposits are well cemented by travertine in Arroyo Peñasco area
- OTtr TRAVERTINE—Principally calcium carbonate deposits of mineral springs in Arroyo Peñasco and Cuchilla Arroyo valleys; as much as 100 feet thick
- Qts SANTA FE GROUP—Pale-red, gray, and brown, unconsolidated to loosely cemented clay, silt, sand, and gravel, in southeast part of study area; may be as much as 2,000 feet thick in this area. Locally may include parts of Zia Sand and Cochiti Formation
- Qtsz SANTA FE GROUP AND ZIA SAND, UNDIVIDED—As mapped includes those sediments south of the Jemez River and east to the Santa Ana fault
- Tv VOLCANIC ROCKS, UNDIVIDED—Consists of a complex pile of lava flows, ash-flow tuffs, and local intrusive bodies as described by Bailey and others (1969) and mapped by Smith and others (1970); these rocks mainly crop out in the Cañada de Cochiti and Ojo del Borrego Grants
- Tc COCHITI FORMATION—Poorly consolidated volcanic to arkosic, reddish sand and gravel; possibly as much as 800 feet thick. Present mainly east of the Santa Ana fault; includes the deposits as mapped by Smith and others (1970); locally may include Zia Sand of Manley (1978)
- Tz ZIA SAND—Light gray to pinkish, well-sorted sand and poorly consolidated sandstone as mapped by Smith and others (1970); well exposed along Jemez River upstream from San Ysidro. May be as much as 1,000 feet thick
- Kmv MESAVERDE GROUP—Light-gray, light-brown, and pale-orange, fine-grained, cliff-forming sandstone and alternating layers of dark-gray to brown shale, claystone, and coal with minor sandstones. As mapped consists of La Ventana Tongue of Cliff House Sandstone at the top, Menefee Formation in the middle, and Point Lookout Sandstone at the bottom
- Kmvm MESAVERDE GROUP AND MANCOS SHALE, UNDIVIDED—As mapped includes geologic units between Tenorio fault and western boundary of study area
- Km MANCOS SHALE—Dark-gray, yellowish-gray, and yellowish-brown shale and silty shale with interbeds of brownish-gray siltstone and yellowish-brown sandstone; present mainly in northwest half of Ojo del Espiritu Santo Grant
- Kd DAKOTA SANDSTONE—Consists of three lithologically distinct units: a light-gray to white, ledge-forming, conglomeratic sandstone at the bottom; dark-gray carbonaceous shale and coaly shale in the middle; and a yellowish-brown, ledge-forming, fine-grained sandstone at the top. As much as 350 feet thick; mainly crops out in Ojo del Espiritu Santo Grant
- Jm MORRISON FORMATION—Consists of four members in study area: in descending order, these are the Jackpile Sandstone, Brushy Basin Shale, Westwater Canyon Sandstone, and Recapture Shale Members. The Jackpile Sandstone Member consists of as much as 180 feet of yellowish-tan to white, fine-grained to coarse-grained arkosic sandstone; thickness decreases northward. The Brushy Basin Shale Member consists of as much as 280 feet of variegated red and green shale with minor interbeds of sandstone and limestone. The Westwater Canyon Sandstone Member consists of as much as 200 feet of yellowish-tan to pink, fine- to very coarse grained and locally conglomeratic, arkosic ledge-forming sandstone. The Recapture Shale Member consists of as much as 350 feet of variegated red and green shale, gray siltstone, and fine-grained sandstone. The Morrison Formation mainly is exposed in the Rio Salado drainage and along the west flank of the Sierra Nacimiento
- Jwt TODILTO LIMESTONE MEMBER OF WANAKAH FORMATION—Laminated to massive gray limestone, 5 to 10 feet thick, overlain by as much as 100 feet of thick-bedded, massive gypsum; mainly exposed on White Mesa and on cuestas along State Highway 44 and in Cuchilla Arroyo valley
- Je ENTRADA SANDSTONE—Reddish-brown, pale-yellow, and white, silty to medium-grained sandstone; as much as 120 feet thick. Forms prominent cliffs below Todilto Limestone Member of Wanakah Formation
- Tc CHINLE FORMATION, UNDIVIDED—Variegated red beds predominately consisting of shale in the upper part and sandstone in the lower part; possibly as much as 1,250 feet thick, but probably averages about 800 feet thick
- Rcp PETRIFIED FOREST MEMBER OF CHINLE FORMATION—Sequence of variegated reddish-brown, red, greenish-gray, and purple shale and silty shale with minor ledge-forming sandstone and brown limestone; possibly as much as 1,000 feet thick, but probably averages about 600 feet thick
- Rca AGUA ZARCA SANDSTONE MEMBER OF CHINLE FORMATION—White to pink, coarse-grained conglomeratic arkosic sandstone; forms steep cliffs and resistant dip slopes; as much as 250 feet thick
- Pgy GLORIETA SANDSTONE AND YESO FORMATION, UNDIVIDED—Yeso Formation consists of as much as 575 feet of orange-buff, fine-grained sandstone; Glorieta Sandstone consists of as much as 100 feet of white to tan, fine- to coarse-grained sandstone. Locally may include Bernal Formation and San Andres Limestone
- Pa ABO FORMATION—Reddish-brown mudstone with minor amounts of light-gray sandstone and nodular limestone, as much as 850 feet thick
- Pu PERMIAN ROCKS, UNDIFFERENTIATED—Consists of Glorieta Sandstone, Yeso Formation, and Abo Formation; locally may include Bernal Formation and San Andres Limestone
- IPm MADERA LIMESTONE—Dense, gray, thick-bedded, fossiliferous marine limestone, with minor amounts of light-gray sandstone, coarse-grained arkosic sandstone, and red and gray shale; as much as 760 feet thick. Locally may include Sandia Formation and Osha Canyon Formation of DuChene and others (1977); also locally may include Log Springs Formation and Arroyo Peñasco Group of Mississippian age
- pCg GRANITE—Pink, fine to coarsely crystalline intrusive igneous rocks; locally may be weakly foliated
- pCgn GNEISS—Pink to gray, fine to coarsely crystalline quartz-feldspar gneiss. Has moderate to strong foliation, mostly trending northeast; locally contains pink granite, apatite, and pegmatitic dikes
- pCu PRECAMBRIAN IGNEOUS AND METAMORPHIC ROCKS, UNDIFFERENTIATED

Base from U.S. Geological Survey 1:100,000 quadrangles: Albuquerque (1978) and Los Alamos (1978)



Geology modified from Wood and Northrop, 1946; Smith and others, 1970; Woodward and Schumacher, 1973b; Woodward and Martinez, 1974; Woodward and others, 1974; Woodward and Ruetschilling, 1976; Kelly, 1977; Woodward and others, 1977; and Manley, 1978

GEOLOGIC MAP OF THE PUEBLOS OF JEMEZ, ZIA, AND SANTA ANA, SANDOVAL COUNTY, NEW MEXICO