

Table 9.--Generalized section of the geologic formations at Fort Carson, and their hydrologic properties

[gal/min, gallons per minute]

Eonothem and Erathem	System	Series	Geologic unit	Thickness (feet)	Physical characteristics	Hydrologic properties		
Cenozoic	Quaternary	Holocene	Landslide deposits		Debris fans and earth flows on steep slopes.	Generally dry; may transmit infiltrated precipitation to underlying deposits.		
			Stream alluvium	0-60	Poorly sorted deposits of clay, silt, sand, gravel, cobbles, and boulders partly filling the valleys of present streams.	Yields small to large quantities of water to wells. Yields of as much as 170 gal/min along Little Fountain and Rock Creeks.		
		Pleistocene	Terrace deposits	0-100	Poorly sorted alluvial deposits of clay, silt, sand and gravel on terraces above and between present stream valleys.	Generally dry; transmits small quantities of water to springs along contact with Pierre Shale and to stream alluvium.		
Mesozoic	Cretaceous	Upper Cretaceous	Pierre Shale	3,000-5,000	Dark gray marine shale and bentonite. Sandy transition zone in upper 400 to 600 feet.	These units generally do not yield water to wells. Combined they tend to retard vertical movement of water from the Dakota-Purgatoire aquifer, producing artesian conditions. In some areas, sandy or fractured zones provide small yields to wells. The quality of water from these units generally is unsuitable for most uses.		
			Niobrara Formation	550-600	Smoky Hill Shale Member: 500+ feet of yellowish-brown soft, thin-bedded, calcareous shale interbedded with thin layers of limestone. Fort Hays Limestone Member: 3 to 40 feet of gray, hard, thin- to thick-bedded limestone.			
			Carlile Shale	150	Juan Lopez Member: Grayish-brown, hard calcarenite. Codell Sandstone Member: Yellowish-gray, thin to massive bedded sandstone. Blue Hill Shale Member: Dark gray, noncalcareous shale. Fairport Chalky Shale Member: Yellowish-gray, soft calcareous shale.			
			Greenhorn Limestone	75	Bridge Creek Limestone Member: Interbedded gray limestone and shale. Hartland Shale Member: Gray shaly calcarenite. Lincoln Limestone Member: Grayish-brown, hard calcarenite, shaly calcarenite, and bentonite.			
			Graneros Shale	75	Dark gray, hard calcareous shale.			
		Lower Cretaceous	Dakota Sandstone	90-110	Yellowish-brown, fine- to medium-grained, cross-bedded massive sandstone that is locally coarse-grained to conglomeratic, having a middle unit of thin-bedded clay, sand, and shale.		The Dakota Sandstone and Lytle Sandstone Member of the Purgatoire Formation form the Dakota-Purgatoire aquifer. This aquifer is capable of yielding 5 to 10 gal/min to wells in most areas; yields of 150 to 200 gal/min to wells can be expected in areas where the permeability of the aquifer is enhanced by fractures.	
			Purgatoire Formation	160-210	Glencairn Shale Member: 60 to 80 feet of dark colored shale and thin-bedded sandstone. Lytle Sandstone Member: 100 to 130 feet of light colored, fine-grained, massive bedded sandstone.			
		Jurassic	Upper Jurassic	Morrison Formation	225		Varicolored gray, maroon, and green siltstone and claystone interbedded with thin beds of sandstone, limestone, and conglomerate.	Not considered to be aquifers because of negligible permeability.
		Triassic		Lykins Formation	180		Varicolored maroon, green, and pink interbedded shale, siltstone, sandstone, and limestone.	
		Paleozoic	Permian		Lyons Sandstone		700-800	Red to yellowish-gray, fine-grained sandstone.
Pennsylvanian	Upper and Middle Pennsylvanian				Fountain Formation	2,100-2,900	Red, maroon, and brown irregularly bedded, coarse- to fine-grained, arkosic sandstone and conglomerate interbedded with siltstone and shale. Glen Eyrie Shale Member: Basal, gray sandstone, sandy shale, and black shale about 100 feet thick.	
Ordovician			Middle Ordovician	Harding Sandstone	0-65	Yellowish-gray and greenish-white fine-grained, thin-bedded sandstone with reddish-brown sandy shale.		
			Lower Ordovician	Manitou Limestone	0-185	Reddish-gray, bedded, dolomitic limestone.		
Cambrian	Upper Cambrian		Sawatch Quartzite	0-25	Reddish-brown, white, and green fine- to coarse-grained sandstone. Some glauconite in upper part. Some dolomite.			
Proterozoic	y		Pikes Peak Granite		Pink to reddish-tan, coarsely crystalline granite.	Yields generally less than 10 gal/min to wells and springs from fractures. Developed mostly for domestic and livestock water supplies in outcrop areas west of Fort Carson.		
			Granodiorite and quartz diorite		Dark gray, medium- to coarsely-crystalline granodiorite and quartz diorite.			