San Luis Valley			
Period	**Phase**	**Stratigraphic Unit**	**Hydrogeologic Unit**
Quaternary	Modern-Glaciation	Alluvium	Unconfined Aquifer RGDSS Layer 1
		Eolian sand	
		Alluvial fans	
Neogene	Extension	Alamosa Formation	Uppermmost clay
			Confined Aquifer RGDSS Layer 2
		Servilleta Basalt	Confined Aquifer RGDSS Layer 3
		Santa Fe Formation	
		Hinsdale Basalt	
		Los Pinos Formation	
Paleogene	Transition	San Juan volcanic field rocks: Ash-flow tuffs	Confined Aquifer
		San Juan volcanic field rocks: Conejos Formation	
Cretaceous	Laramide	Blanco Basin-Vallejo formations	Confined Aquifer
		San Juan Basin Laramide aged formations are present locally in structural blocks within the San Luis Valley in what is often called the *"San Juan Sag"*	
	Interior Seaway	Regional Cretaceous Seaway shale-dominated formations form multiple hydrogeologic units, most are confining units; only recently recognized in the Crestone area as isolated ouctrops and in deep borehole stratigraphic tests	
Jurassic Triassic	Mesozoic Sandstones	No strata recognized in this area	
Permian Pennsylvanian	Ancestral Rocky Mountains	Ancestral Rocky Mountains event marine and non-marine sedimentary formations form multiple hydrogeologic units in the Eagle Basin-Central Colorado Trough are present in the uplifted Sangre de Cristo Mountains and mountains west of Villa Grove	
Mississippian Devonian Silurian Ordovician Cambrian	Paleozoic Carbonates	Older Paleozoic sedimentary formations preserved in the Ancestral Rocky Mountains event Eagle Basin-Central Colorado Trough are present in the uplifted Sangre de Cristo Mountains and mountains west of Villa Grove	
Precambrian	Precambrian	Crystalline rocks of igneous and metamorphic origin in mountainous region	Crystalline bedrock

Table 12a-02-01. San Luis Valley stratigraphic chart.

San Luis Valley

Period	Phase	Stratigraphic Unit	Unit Thickness (ft)	Physical Characteristics	Hydrogeologic Unit	Hydrologic Characteristics
Quaternary	Modern-Glaciation	Alluvium	0-120??	Well to poorly-sorted, uncemented sands, silts and gravels along modern streams and as valley-fill	Unconfined Aquifer RGDSS Layer 1	
		Eolian sand	0-400??	Well-sorted sands forming active and stabilized dunes		
		Alluvial fans		Poorly-sorted, rounded to sub-angular gravels, sands and silt fanning out into the valley where streams leave the mountains; four levels of fans are recognized with the youngest at stream level, a second 2-12 feet above modern stream level, a third as moderately dissected terraces about 40 feet above modern stream levels and a fourth as strongly dissected terraces 69-90 feet above modern stream level that can have a caliche layer near the surface		
Neogene	Extension	Alamosa Formation	0-2,000	Interbedded, discontinuous blue, gray and green clays and dark sands; sands are dominantly fine-grained; uppermost clay divides valley into upper unconfined aquifer and lower confined aquifer	Uppermmost clay	
					Confined Aquifer RGDSS Layer 2	Confined aquifer is that below the uppermost clay layer in the Alamosa Formation
		Servilleta Basalt	0-660	Thin flows of tholeitic basalt, vuggy, and local vesicle pipes at the top of the Santa Fe Formation and Los Pinos Formation in southern part of the valley		
		Santa Fe Formation	>5,800	Variegated tan, pink, buff, orange to brick-red maroon claystone, siltstone, and poorly-sorted sandstone and conglomerate, with interbedded volcanic flows of the San Juan Mountains and Taos Plateau; top of the unit is dominantly conglomerate and sandstone, while bottom is dominantly siltstone and shale; deposits are cross-bedded and channel cut	Confined Aquifer RGDSS Layer 3	Interbedded volcanic flows have different aquifer characteristics from the valley-fill deposits; where unfractured, lava flows can form aquitards
		Hinsdale Basalt	0-980	Lava flows, flow breccia, and pyroclastic deposits of of basaltic to andesitic composition interlayered with the Los Pinos Formation and predating the Servilleta Basalt of the Taos Plateau.		Fractured to unfractured lava flows, fracturing enhances permeability
		Los Pinos Formation	0-660	Conglomerate, sandstone, and mud-flow breccias containing clasts of volcanic rocks derived from the San Juan volcanic field to the west; recognized in the southwest part of the valley and may be equivalent to, and interfingers with, the Santa Fe Formation found further to the east		Relatively low hydraulic conductivity and may form aquitard
Paleogene	Transition	San Juan volcanic field rocks: Ash-flow tuffs	0-2,000	Multiple ash-flow tuffs erupted from volcanic centers in the San Juan volcanic field to the west between 26 and 30 million years ago and predate formation of the rift graben; major tuffs include the Treasure Mountain Tuff, Masonic Park Tuff, Fish Canyon Tuff, and Carpenter Ridge Tuff	Confined Aquifer	
		San Juan volcanic field rocks: Conejos Formation	0- 5,000	Lava flows and volcaniclastic rocks of intermediate composition derived from strato-volcanoes in the San Juan volcanic center between 30 and 35 million years ago; heterogenous assemblage of flows, flow breccias, debris flow deposits, stream-laid conglomerate and sandstone, and rare ash-flow tuffs		
Cretaceous	Laramide	Blanco Basin-Vallejo formations	0-2,300	Red to reddish-brown, nonvolcanic sandy mudstone,coarse arkosic sandstone, and conglomerate	Confined Aquifer	
		San Juan Basin Laramide aged formations are present locally in structural blocks within the San Luis Valley in what is often called the *"San Juan Sag"*				
	Interior Seaway	Regional Cretaceous Seaway shale-dominated formations form multiple hydrogeologic units, most are confining units; only recently recognized in the Crestone area as isolated ouctrops and in deep borehole stratigraphic tests				
Jurassic Triassic	Mesozoic Sandstones	No strata recognized in this area				
Permian Pennsylvanian	Ancestral Rocky Mountains	Ancestral Rocky Mountains event marine and non-marine sedimentary formations form multiple hydrogeologic units in the Eagle Basin-Central Colorado Trough are present in the uplifted Sangre de Cristo Mountains and mountains west of Villa Grove				
Mississippian Devonian Silurian Ordovician Cambrian	Paleozoic Carbonates	Older Paleozoic sedimentary formations preserved in the Ancestral Rocky Mountains event Eagle Basin-Central Colorado Trough are present in the uplifted Sangre de Cristo Mountains and mountains west of Villa Grove				
Precambrian	Precambrian	Crystalline rocks of igneous and metamorphic origin in mountainous region			Crystalline bedrock	

Table 12a-02-01. San Luis Valley stratigraphic chart,detailed. Colorado Geological Survey ON-010 Colorado Groundwater Atlas.

Sources: Emery (1971); Stevens and Lipman (1975); Huntly (1976); Thompson and Lipman (1984); Brister and Gries (1996); Watkins (1996); Harmon and others [HRS] (2012); Raynolds and Hagadorn (2017)