The Water Supply in Placitas

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This brief description of the water supply in Placitas is based on three principal sources: the "Johnson Report,"[1] a comprehensive study by the New Mexico Bureau of Geology and Mineral Resources; the records of water wells in the files of the New Mexico Office of the State Engineer;[2] and John Shomaker & Associates Inc.'s more than 30 years of experience with Placitas wells and springs.

WHERE DOES THE WATER COME FROM?

The Placitas domestic supply comes from groundwater pumped from wells, except for the water distributed by the Las Acequias de Placitas system, which comes from a group of springs near the base of the western slope of Cuchilla Lupe, just southeast of the village. The total number of Placitas wells with New Mexico Office of the State Engineer permits as of 2026 is about 1,200, with some wells existing before the New Mexico Office of the State Engineer declared the administrative Rio Grande Underground Water Basin in 1956, when well permits began to be required.

Most Placitas residents get their water from one of 14 "mutual domestic" water systems, each of which typically draws from several wells or springs and serves between 25 and 650 customers. Based on New Mexico Environment Department records3 the average water-use per household is about 0.19 acre-feet, or 63,000 gallons per year. This volume would fill a large living room, about 25 x 25 feet with a 13-foot ceiling. Water use in Placitas is highly dependent on local availability and people's ability to pay for it.

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[1] Johnson, P.S. and Campbell, A., 2002 (updated 2008), Hydrogeology and water resources of the Placitas area, Sandoval County, New Mexico: N.M. Bureau of Geology and Mineral Resources, Open-file Report 469. https://doi.org/10.58799/OFR-469.

[2] State Engineer website: https://www.ose.nm.gov,
Water-rights records: https://www.ose.nm.gov/WRAB/index.php.

[3] See https://dww.water.env.nm.gov/Maps/Map_Template.jsp, accessed in early 2026.

The rest of the households are supplied by individual wells, or "cluster" wells, serving up to five households. There are also a few small-yield commercial and institutional wells. The total demand in the Placitas area might be around 400 acre-feet per year.

The groundwater system is recharged predominately as snowmelt, and to a lesser degree, warm-season runoff which infiltrate through arroyo bottoms and fractures in bedrock on the slopes of the Sandia Mountains. Water moves downward, and generally to the northwest and west, through the very complex assemblage of geologic units between the mountains and the Rio Grande, and ultimately discharges to the river. Discussion of the origins and geologic characteristics of these units can be found in summaries in preparation (2026) of Placitas and Sandia Mountain geology. There are four broad categories of groundwater aquifers in the Placitas area, as shown on Figure 1 and Table 1, and each of these categories includes a great deal of variation. The four categories: are: alluvium and unconsolidated or poorly consolidated river deposits of the Santa Fe Group, coalesced alluvial-fan deposits of the Santa Fe Group, older sedimentary bedrock, and the Sandia Granite and other crystalline rocks.

Santa Fe Group - Unconsolidated, River-Deposited Gravel, Sand, Silt, and Clay Beds

The areas in which these beds are present in the subsurface are shown as peach and darker orange on Figure 1 (see Table 1 for the color code). These beds are 2 to 23 million years old and reach aggregate thicknesses of as much as several thousand feet. The beds have relatively high permeability and support high well yields. They are present in the subsurface west of a roughly northeast-southwest line at about the position of The Merc. Roadcuts along Camino Manzano, and the walls of the Vulcan Materials gravel pit, just east of the I-25 frontage road, provide good exposures of these beds.

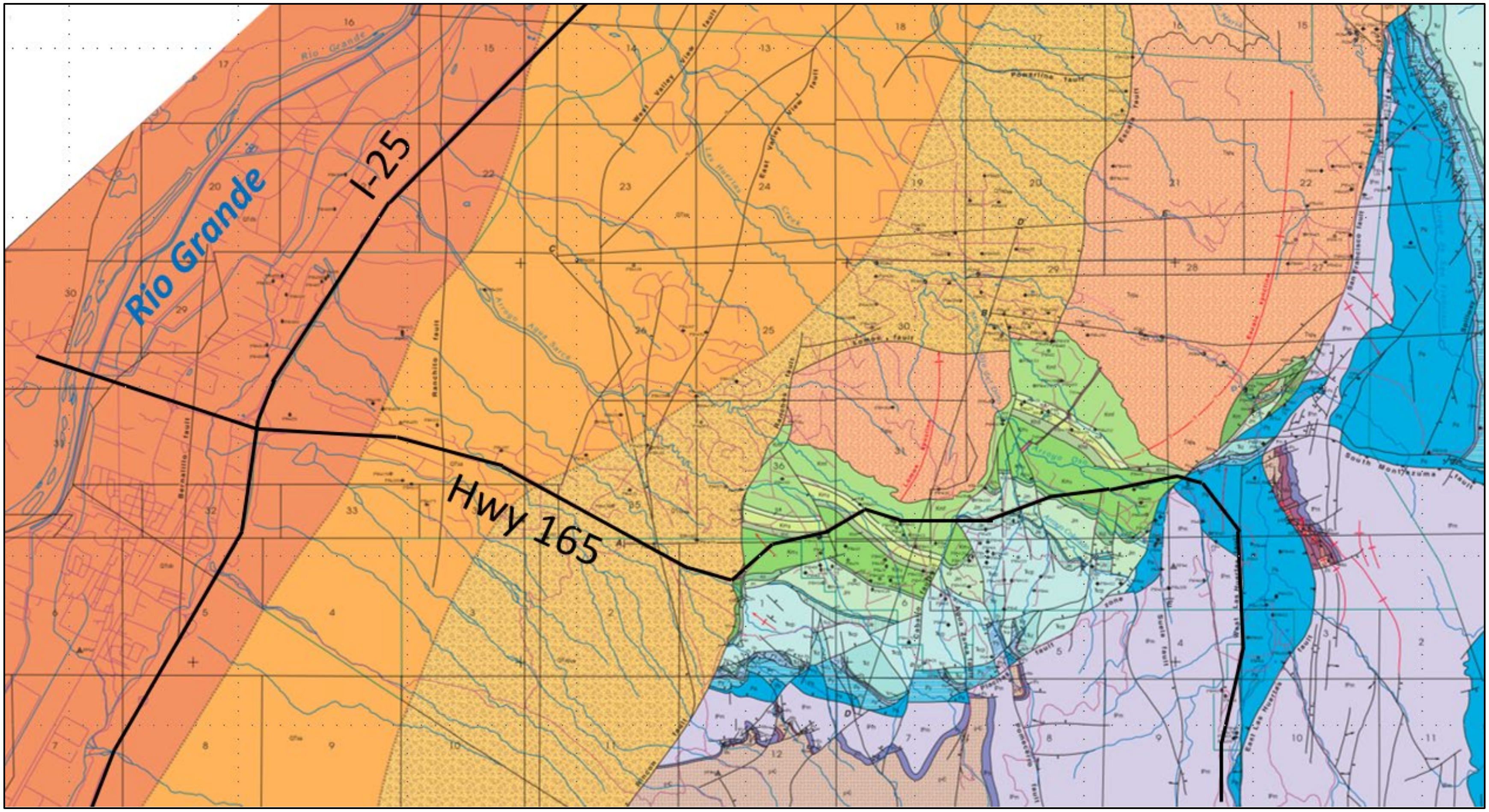

Figure 1. Simplified geologic map of Placitas area (from Johnson and Campbell, 2008) with major highways added. Colors representing geologic units at the surface are described in Table 1. The narrow, solid black lines with the "half-dumbbell" symbol represent major faults, with the symbol indicating the downthrown block.

Table 1. Simplified summary of the aquifers of the Placitas area.

Aquifer Sequence	Major Unit		Colors on Figure 1		Typical Aquifer Character		Well Yields, gpm	
Santa Fe Group	River-deposited sands, etc.	Alluvial fan deposits			full thickness is highly permeable	full thickness is moderately permeable	100s to 1,000s	10s to 100s
Older sedimentary bedrock	Cretaceous and Jurassic formations				thin, low-permeability sandstones; thick, very tight shales		10s or less from sandstones	
	Chinle Formation				very low permeability shale, except a few thin sandstones		10s or less from sandstones	
	San Andres Ls.-Glorieta Ss.				low permeability except for fractures		a few to 100s	
	Madera Limestone				low permeability except for fractures		a few to 100s	
Sandia granite	Sandia Granite, other crystalline rocks				very low permeability except for some small fractures		a few	

gpm – gallons per minute

Santa Fe Group - Alluvial-Fan Deposits

The alluvial-fan deposits consist of boulder and cobble conglomerates, gravelly sandstones, siltstones, and minor clay beds, but with more cementation and lower permeability than the river-deposited Santa Fe Group beds of the same age. The alluvial-fan deposits also support relatively high-yield wells. The area in which these beds constitute the local aquifer are shown as light orange and darker orange-pink on Figure 1 and Table 1. The alluvial fans are made up of material that has been eroded from the mountains along the eastern side of the Rio Grande valley and deposited in coalescing layers over 2 to 23 million years. A good place to see the alluvial-fan deposits is in the roadcut of the "S-curve" on Highway 165; one of the major faults that separates the alluvial-fan deposits from older bedrock strata is evident near the eastern end of the roadcut, at about Mile 3.6.

Older Sedimentary Bedrock: Cretaceous, Jurassic, and Triassic Strata, and Underlying Paleozoic Limestones

These sedimentary bedrock units are shown in shades of green, blue, and lavender on Figure 1. These are consolidated bedrock units, in contrast to the less-consolidated and less-cemented Santa Fe beds, and range in age from 66 to more than 300 million years. This category includes beds of sandstone, siltstone, shale, and limestone, and can be seen in outcrops in many places in eastern part of the Placitas area and in Las Huertas Canyon. A number of the sandstone beds support small well yields, but intervening shales, in some cases very thick, provide only very minimal yields at best. The thick limestones at the bottom of the sequence of sedimentary rocks yield water from fractures, and well performance is highly variable depending on the number and size of fractures intersected in drilling.

These bedrock sandstones occur beneath the Placitas Library and may be observed in the arroyo behind the building; this geologic situation is the reason that the Placitas Library and adjacent area are deficient in well water supply. The bedrock strata are broken into many blocks by faults; the major faults are shown on Figure 1 as the narrow black lines with the "half-dumbbell" symbol that indicates which side of the fault is downthrown. The faults and associated fractures can be both barriers and conduits for groundwater flow, in that a fault may offset an aquifer against a much-less-permeable shale unit and greatly impede lateral flow, and at the same time allow vertical flow from or into units above and below.

The Sandia Granite and Other Crystalline Rocks

Beneath the stratified sedimentary bedrock units is the Sandia Granite, the crystalline rock that we see in most of the west face of the Sandias. It has been dated at t 1,453 million years, and apart from fractures that may transmit a little water, it has extremely low permeability and represents the floor of the groundwater system.

WHAT ABOUT WELL PERFORMANCE AND LONGEVITY?

The Groundwater Budget

Although the volume of water in the Placitas groundwater system, and the estimated annual recharge to the system, are large relative to the annual demand, these numbers are nearly meaningless in terms of the capacity and longevity of an individual well. The volume in groundwater storage within the roughly 22 square miles of the populated area might be estimated at some 1.4 million acre-feet (one acre-foot is equivalent to 325,851 gallons). This estimate is based on an assumed average porosity of the geologic materials of 20 percent, and an arbitrary, but reasonable, well depth of 500 ft below the water table. The annual recharge to the system in the Placitas area has been estimated at many hundreds of acre-feet.[4] If the annual demand is in the order of 400 acre-feet (as mentioned on pg. 1), the supply would appear to be ample to last for many centuries, but this calculation has almost nothing to do with the performance of any individual well.

The groundwater is, strictly speaking, a "pass-through" system, but the water moves through the system (from recharge to natural discharge) extremely slowly. Many samples have been isotopically dated to estimate the time the water has been moving within the various aquifers; the range in age, from the time the water entered the aquifer, is from less than 100 years for water very close to the point of recharge, to about 32,000 years.[5] Most Placitas groundwaters have been in the ground for several thousand years.

The Factors that Govern Well Performance

A well capable of supplying one household can be drilled almost anywhere in the Placitas area, but well yields vary dramatically from place to place depending on the underlying geology. The capacity of a well is determined by the permeability of the aquifer or aquifers penetrated by the well, the drawdown of the water-level in the well that is created by pumping, and the efficiency of the well. Permeability is a characteristic of the aquifer material itself and the degree of fracturing, and drawdown is limited by depth of the well below the non-pumping water-level. Well efficiency is a measure of the resistance to flow as water enters the well from the aquifer and is governed by the drilling method and by the way the casing is perforated to allow flow into the well. These parameters may vary widely within neighborhoods, and even among wells in close proximity.

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[4] See, for example, McAda, D.P., and Barroll, P., 2002, Simulation of ground-water flow in the Middle Rio Grande Basin between Cochiti and San Acacia, New Mexico: U.S. Geological Survey Water-Resources Investigations Report WRIR 02-4200, figure 10.

[5] See Johnson and Campbell, 2008, op cit., table 6.

The Life-Span of a Placitas Well

In some cases, lost production capacity can be restored simply by lowering the pump, but that solution may not be sufficient. Many Placitas wells have been "deepened" to regain capacity, typically by replacement with a deeper well because it isn't generally practical to drill deeper through the casing of an existing well. Some wells have been replaced more than once by successively deeper wells. One estimate, by Murray Drilling Co. in Bernalillo, is that a typical Placitas domestic well with steel casing lasts for about 20 years. The life of a well is governed by several factors, among them "boundary conditions" inherent in the geologic setting of the well, regional or local water-level decline, and failure of the casing or screen.

"Boundary Conditions:" A well that produces from a relatively small fault-bounded block of aquifer material commonly pumps water from storage in the block more rapidly than water moves into the block from adjoining blocks. The water-level declines until there is too little water above the pump in the well to allow the drawdown consistent with the needed pumping rate. At that point, it may be possible to extend the life of the well by pumping for more time each day but at a much lower rate, which in turn, may require more water storage-tank capacity at the surface, or it may be time to abandon and replace the well with a deeper one tapping a different aquifer within the block.

Water-Level Decline: The volume of groundwater in storage, measured in terms of the depth to the water table is governed by two major influences. One is the amount of pumping from wells. The other is the rate at which recharge can pass through the aquifer system and ultimately reach the natural discharge into the Rio Grande. Because the transmissive characteristics of the aquifer system do not change significantly over time, the position of the water table will rise and fall as the recharge is greater or less.

Climate Change: As the climate continues to change toward higher temperatures, and the consequent higher rates of evaporation, there will be less snowpack on the upper slopes because of sublimation, and the snowmelt that is available will run off more rapidly, so that less will be available for recharge. This will contribute to water-level declines in the aquifers. Again, the remedy for existing wells is likely to be either a reduction of the pumping rate over a long time period, or replacement of the well with a deeper one.

Melis (2026)[6] has summarized the pattern of groundwater-level declines in Placitas wells. The average depth to water in wells was roughly stable through the 1960s and 1970s, ranging from 155 to 169 ft, then fell to about 195 ft in the 1980s, and to about 209 ft in the 2020s. The recent overall average rate of decline has been about 2.0 ft per year. Water-level declines have been greatest in wells completed in relatively small fault blocks (as defined by the narrow black lines on Figure 1) in the older bedrock aquifers in the eastern part of the area, and least in the river-deposited Santa Fe Group aquifer beds near I-25.

Casing or Well-Screen Failure: Wells with steel casing may begin to produce excessive sand because of corrosion that enlarges the openings that admit water (commonly referred to as the well screen, although the openings may be torch-cut slots). Sand can accumulate in the well to the extent that the screen is partly or largely covered, severely limiting the flow into the well. In addition, several types of bacteria can infect a well, and create slimes or encrustations that block the screen. Wells with PVC (plastic) casing are vulnerable to failure if a submersible pump motor overheats and weakens the casing to the extent that it collapses around the pump. Sometimes these problems can be resolved, at least temporarily, but in many cases replacement is the only remedy.

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[6] Melis, E.A., 2026, Groundwater resources of the Placitas Area, Sandoval County, New Mexico-- an update: N.M. Geological Society 76th Annual Field Conference Guidebook (in press). Will be available from N.M. Bureau of Geology and Mineral Resources, https://geoinfo.nmt.edu/publications/nmgs/guidebooks/home.cfml .

WHAT ABOUT WATER QUALITY?

Placitas groundwater is typically "hard," in that it contains significant concentrations of calcium and magnesium, but chemical quality is generally good. The Santa Fe Group aquifers and the Madera Limestone (Figure 1 and Table 1) commonly yield water with a few hundred milligrams per liter total dissolved solids (mg/L TDS), which may be compared with the accepted standard for potability of 1,000 mg/L. The Cretaceous and Jurassic bedrock aquifers have higher TDS concentrations in some places because of coal and gypsum beds, respectively, within the geologic units.

Arsenic is present in high enough concentrations, in some areas, to require treatment for use in public supply. In general, water in the Santa Fe Group beds (Figure 1 and Table 1) has arsenic concentration near or above the Environmental Protection Agency Maximum Contaminant Level (MCL) of 10 parts per billion (ppb). A small area of bedrock aquifer near the foot of the mountain south of the village also has groundwater near the MCL.[7] Several of the "mutual domestic" systems have installed arsenic-removal equipment.

The Placitas area relies on septic tanks for wastewater disposal, and residents with both a well and a septic tank should have the well water sampled and tested regularly for coliform bacteria and nitrate concentration.

[7] See Johnson and Campbell, 2008, figure 32, for a map showing arsenic concentration in groundwater.

WHAT ABOUT THE LONG TERM?

Declining water levels will cause many wells in the bedrock aquifers in the eastern part of the area to falter within the next few years, but it is probable that most can be replaced with deeper wells. Pumping lifts will continue to increase over time in most or all Placitas wells. Even so, in the near and intermediate term, a few decades at least, it seems probable that local groundwater will continue to supply the area. In the longer term, it seems likely that an integrated system relying on groundwater from the Santa Fe Group aquifer in the western part of the Placitas area, with treatment for arsenic, will be necessary.

A few Placitas residents have installed underground cisterns adjacent to their homes to capture rain runoff from their roofs, and a few more use rain barrels at the surface to capture runoff from roofs for plant irrigation. Because of intermittent precipitation and plant irrigation requirements, many find these water sources of questionable value, even though in theory they may be desirable.