

# MEMORANDUM

New Mexico Office of the State Engineer  
*Water Use and Conservation Bureau*

April 5, 2002

**To:** Brian Wilson, P.E., Water Use and Conservation Bureau Chief

**From:** Patrick J. Romero, Water Master I

**Subject:** Abbe Springs Subdivision, Socorro County

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The Abbe Springs Subdivision proposal is a request to develop numerous parcels, a combined 4,196-acres in size, into a 135 lot residential subdivision. This parcel is located approximately 12 miles Northwest of Magdalena, N.M.. It was reviewed pursuant to the Socorro County Subdivision Regulations, and the New Mexico Subdivision Act. The subdivider proposes that his subdivision will be supplied with domestic water via individual N.M.S.A. 72-12-1 domestic wells.

In Section Three, Article II B.3.f.3 of the Socorro County Regulations, it states that the subdivider is required to provide a geohydrologic report. This report shall demonstrate that water is available for this development. This report should include well logs, well tests, geologic cross-sections, and a 40-year schedule of effects. The subdivider has failed to fulfill this requirement.

The "Water Quality and Quantity Assesment" report submitted by John Shomaker included driller logs to four wells. These wells, which were located on the property, are low producers. The well driller claimed that they produced up to 8 gpm, but the pump tests performed on two of them appeared to contradict this. In the preparation of the report, two of the four wells were pump-tested. Due to the size of the properties and the incongruous nature of the geology in the area, this was not enough to adequately characterize the aquifer(s) under this subdivision. The wells tested were in areas which were best suited for higher production; no wells were tested which are located in higher elevations, where much of the property is located, and where higher well yields would be less likely. The well test records were not submitted for further analysis, but neither of the wells tested were shown to be adequate for domestic use.

The pump tests had very disturbing results. RG-77056 was pumped at 4 gpm for only 400 minutes. It appears that the pump test was discontinued when the technician performing the test realized that water level was approaching the bottom of the well. The water level had been reduced 311.85 feet. The Jacobs drawdown and recovery data was not provided. The graphical evaluation provided was not correctly labeled, and it was incomplete. The author did not calculate the transmissivity nor did he evaluate the

recovery. An analysis of this graph does show that the well is not adequate for domestic production. The fractured systems, interbedded between clay layers, and limited by impermeable boundaries drilled into cannot be considered a good source of water. Furthermore, any long-term predictions based on this well cannot be accurately predicted, due to the de-watering that would occur in the fractures. The performance of this well is so poor, it is considered to be “infeasible for domestic use” by the U.S. Department of the Interior (Groundwater Manual, 1977, 1988).

Well RG-76237 was pumped several days later. This well, which the driller claimed could produce 7 gpm, was pumped at 2 gpm for only 1000 minutes. It appears that this pump test was discontinued when the water level reached the bottom of the well. The Jacobs evaluation done was on semi-log paper that was both skewered and mislabeled. The author did not provide the line from which he determined his transmissivity, but indicated that he used a line along the drawdown between 80 and 1000 seconds. He obtained a transmissivity of 1.2 ft<sup>2</sup>/day. The selection of this data renders the best possible solution for the developer. When he evaluated the recovery data, he used more late-time data, which is more accurate. His evaluation rendered a transmissivity of 1.18 ft<sup>2</sup>/day. It appears this evaluation was done on the mislabeled and extremely skewered part of the semi-log paper. My evaluation rendered that the aquifer had a transmissivity of 0.34 ft<sup>2</sup>/day. The actual data from the test was not included in the report. Further analysis of this “aquifer” is not possible due to the in descript and incomplete drillers well log submitted. The performance of this well was so poor, it is also considered to be “infeasible for domestic use” by the U.S. Department of the Interior.

The author did not provide an adequate model to predict if water would be available for the 40 year period prescribed by the County Regulations. He simply provided a graph of 40-year drawdowns. He states how he determined these drawdowns (Theis), but does not show the model, or the aquifer characteristics used in it. All the aquifer characteristics he lists in the chart are much better than the characteristics found in the wells on the property, thus these results are not valid.

Section Three, Article II, B.3.f.3.b. of the Socorro County Land Subdivision Regulations requires an assessment of the off-site effects which may result from the increase of groundwater withdrawals for a proposed subdivision. The Shomaker report states that because no wells exist on adjacent properties, there are no wells that will experience water level declines or go dry as a result of individual domestic well development. However, the Shomaker report does not evaluate the impact of groundwater pumping on springs that exist in the study area, and these springs are an important source of drinking water for livestock. Thus, the assessment of off-site effects is incomplete.

The subdivider has not calculated the maximum annual water requirements, pursuant to Section Three, Article II B.3.d Water requirements should be separated into indoor and outdoor uses. Restrictions on irrigated area should be specified in the disclosure statement and the covenants. It is important that they be consistent with the water requirement calculations, to ensure that residents will not exceed the amount of water that

the domestic wells can provide. It is suggested that the developer refer to Office of the State Engineer Technical Report No. 48 entitled "Water Conservation and Quantification of Water Demands in Subdivisions" (Wilson, 1996) to calculate indoor and outdoor water requirements. The developer should also refer to Article 2, Section B.1 of the Regulations, which outlines water conservation measures

The developer should note that the water quality analysis done revealed that the water found in his aquifers is of poor quality. The developer should consider the increased use of groundwater necessary to filter this water to make it potable. This filtering could double the demand of water necessary for this development.

It is my conclusion that the subdivider has not demonstrated that sufficient water is available to meet the requirements of his development. A **negative** opinion to this effect should be issued.