

## **Study says there may be limits to sustainable growth south of Taos**

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A recently completed water study on the southern Taos Valley suggests shallow groundwater levels may be falling in some areas, and deep aquifers may not be a reliable source of drinking water in the long term.

“Hydrologic Investigation of the Southern Taos Valley, Taos County, New Mexico” was written by hydrogeologist Peggy Johnson and geologist Paul Bauer as part of the New Mexico Bureau of Geology and Mineral Resources’ aquifer mapping program. The report was co-authored by Brigitte Felix.

The primary purpose of the study was to get a better understanding of the area’s hydrology in order to better manage groundwater development. “Report findings can help the county make defensible, science- based decisions on water supply and water quality, assist local communities in maintaining adequate water supplies, and guide future use of shallow and deep groundwater supplies,” the report states.

The study area stretches from Miranda Canyon in the south, north to Los Cordovas and west to the confluence of the Rio Pueblo de Taos and Rio Grande.

### **Supply concerns**

A primary impetus for the study was a proposal seven years ago to build a subdivision on what was then private land in the Miranda Canyon area. The proposal was shot down by Taos County, in part, because of worries over water supplies.

As part of the study, investigators with the Bureau of Geology and Mineral Resources were in the field gathering data primarily between January 2011 and September 2013.

The report’s authors used water level measurements taken at dozens of wells throughout the study area to get a better picture of groundwater flow, quantify current and historic water levels and pinpoint aquifer levels.

What they found was an “exceptionally complex geologic setting [that] translates into an exceptionally complex groundwater network that includes three distinct aquifers.”

### **A recent look back**

In 2011, investigators took water level measurements from 54 shallow wells between Llano Quemado and Los Cordovas. They then took measurements during a similar period in 2012 and found that water levels in 83 percent of the wells had dropped by an average of 0.7 feet. The team then went back in 2015 to check water levels in 13 wells, and found that all but two saw a continuing decline in water levels. Investigators found some wells fell as much as 6.3 feet over the multiyear-year period.

The report says there are several potential explanations for this decline. Among those listed in the report are a prolonged drought between 2008 and 2014, groundwater pumping by wells in the area, or a combination of the two.

Investigators concluded that most of the shallow groundwater in these valleys is less than 3.5 years “old,” meaning the time the water has been underground.

The report says additional study over a longer period would provide more certainty for the causes of drops in groundwater levels. But it does argue that groundwater pumping is a “likely” cause of water table drops in the Los Cordovas area, and it should be watched closely.

“Where early recognition of overdevelopment leads to comprehensive monitoring (and the results indicate continued declines as a direct consequence of depletion) then the public awareness and knowledge can more effectively move communities, local government and water resource administrators to mitigate the depletion,” the report reads.

### **Other takeaways**

The report authors also offer an explanation for high fluoride levels in some Llano Quemado wells. Fluoride is often linked to thermal waters, and Llano Quemado sits down valley of a thermal area that includes the Ponce de Leon springs up Miranda Canyon. For some wells, the thermal water is diluted with calcium- rich stream recharge and fluoride is reduced, the report states.

One big takeaway from the report is a description of groundwater limitations.

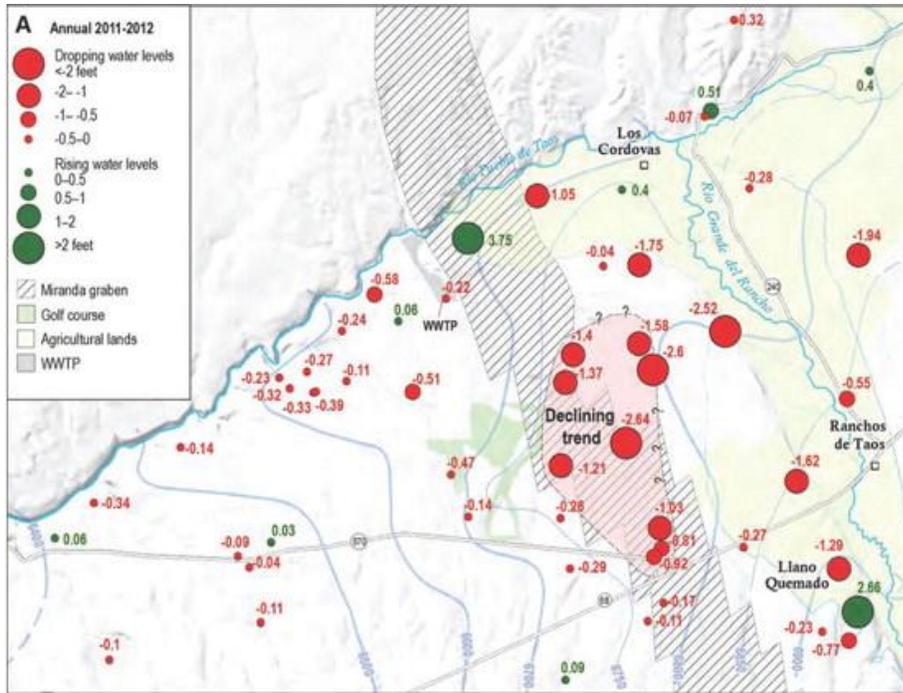
The Miranda Canyon area, for instance, was slated for development around 2008. It was private land, but it has since become part of the Carson National Forest.

According to the report, that may have been the right decision.

“There is no viable water supply in Miranda Canyon to support development,” the report bluntly states.

The report also notes that a “deep confined aquifer” in the study area may not be a reliable source of water for future growth. “The deep confined aquifer has been targeted for future water development,” the report says. “Minimal confined aquifer storage, fault-related flow barriers, aquifer compartmentalization and upward leakage of poor quality groundwater from bedrock faults are limitations for the development of deep confined aquifers in the southern Taos Valley.

The report, published this month, was paid for by Taos County, the Healy Foundation and the Bureau of Geology and Mineral Resources.



A map from a recently completed hydrologic report shows the annual change in groundwater levels as measured in several Los Cordovas wells in 2011 and 2012. The area highlighted in red shows a “decline trend” where well water levels fell by as much as 2.6 feet in a year. The report’s authors suspect declining shallow groundwater was related to a combination of drought and groundwater pumping — and they suggest the area continue to be monitored.

Courtesy graphic