

# GAM run 03-26

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## REQUESTOR:

Gary Westbrook, Post Oak Savannah Groundwater Conservation District.

## DESCRIPTION OF REQUEST:

Post Oak Savannah Groundwater Conservation District requested the following pumping scenario from the Central Carrizo-Wilcox Groundwater Availability Model (GAM):

- Add a total of 20 - 3,000 gpm wells to the Simsboro aquifer in Burleson County according to the following schedule:

2003 – 1 new well  
2004 – 3 new wells  
2005 – 6 new wells  
2006 – 2 new wells  
2007 – 2 new wells  
2008 – 2 new wells  
2009 – 2 new wells  
2010 – 2 new wells

for a total of 96,800 acre-ft/year.

- Distribute the 20 wells according to Figure 1.
- Do not add any wells after 2010; however, run the model with the 20 new wells in place until 2030.

## METHODS:

To address the request, we:

- Added wells pumping at 3,000 gpm or 4,840 acre-feet/year to the existing 2001-2010 pumpage files. The pumpage distribution in 2010 was continued for 20 years until 2030.
- Plotted model head distribution in the Simsboro aquifer for 2001, 2005, 2010, 2020, and 2030.

## **PARAMETERS AND ASSUMPTIONS:**

For the period 2001 – 2010 it is assumed that the pumpage in all other aquifers and in all other counties is what was modeled in the predictive GAM runs reported in Dutton and others (2003). Those pumping distributions are based on the regional water planning group demand predictions. For the period from 2011 – 2030, the pumping distribution is the same as in 2010. The wells shown in Figure 1 are distributed so that each 3,000 gpm well includes five contiguous square miles (about 1 acre per gpm).

## **RESULTS:**

### **Distribution of Heads in the Simsboro Aquifer**

The locations of the new wells are shown in Figure 1. The two digit number in the model cells indicates which year each new well was added.

The distribution of heads in the Simsboro aquifer for 2001 is shown in Figure 2 for comparison with the head distribution after the wells were added. The distribution of heads in the Simsboro for 2005 after 10 wells have been added is shown in Figure 3. Heads for 2010 after 20 wells have been added is shown in Figure 4. The head distributions after an additional 10 years and 20 years of pumping are shown in Figures 5 and 6 respectively.

Figure 2 shows that the heads in the Simsboro aquifer in Burleson County are between 150 and 250 feet above sea level in 2001 before the addition of the new wells. Figure 3 shows a cone of depression in 2005 centered around northwest Burleson County after 10 wells were added. The Simsboro aquifer heads in northwest Burleson County are simulated to be below sea level (0 foot contour) in 2005. Figure 4 shows the head distribution after the 20 new wells have been added by 2010. The heads in northwest Burleson County in Figure 4 are more than 400 feet below sea level and the heads in the center of the cone of depression are more than 500 feet below sea level.

Figures 5 and 6 show a slowly expanding cone of depression and by 2030 most of the heads in northwest Burleson County are more than 500 feet below sea level with a small area of more than 600 feet below sea level.

## **REFERENCES:**

Dutton, A. R., Harden, R., Nicot, J. P., and O' Rourke, D., 2003, Groundwater Availability Model for the Central part of the Carrizo-Wilcox Aquifer in Texas: Final Report prepared for the Texas Water Development Board.

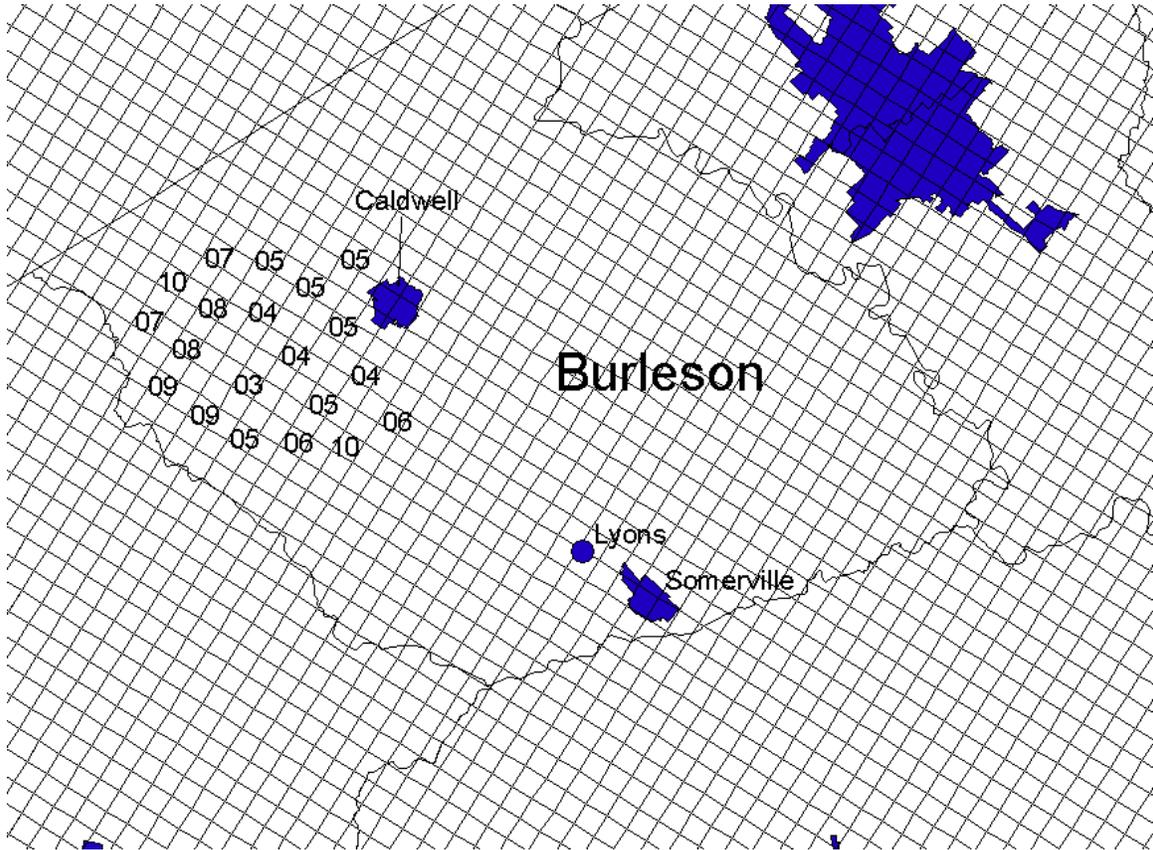


Figure 1. Central Carrizo-Wilcox model grid in Burleson County. The grid cell location of the new wells are shown by a two digit number indicating the year the wells were added in the simulation. The wells are spaced so that each well has at least 5 contiguous square miles of area.

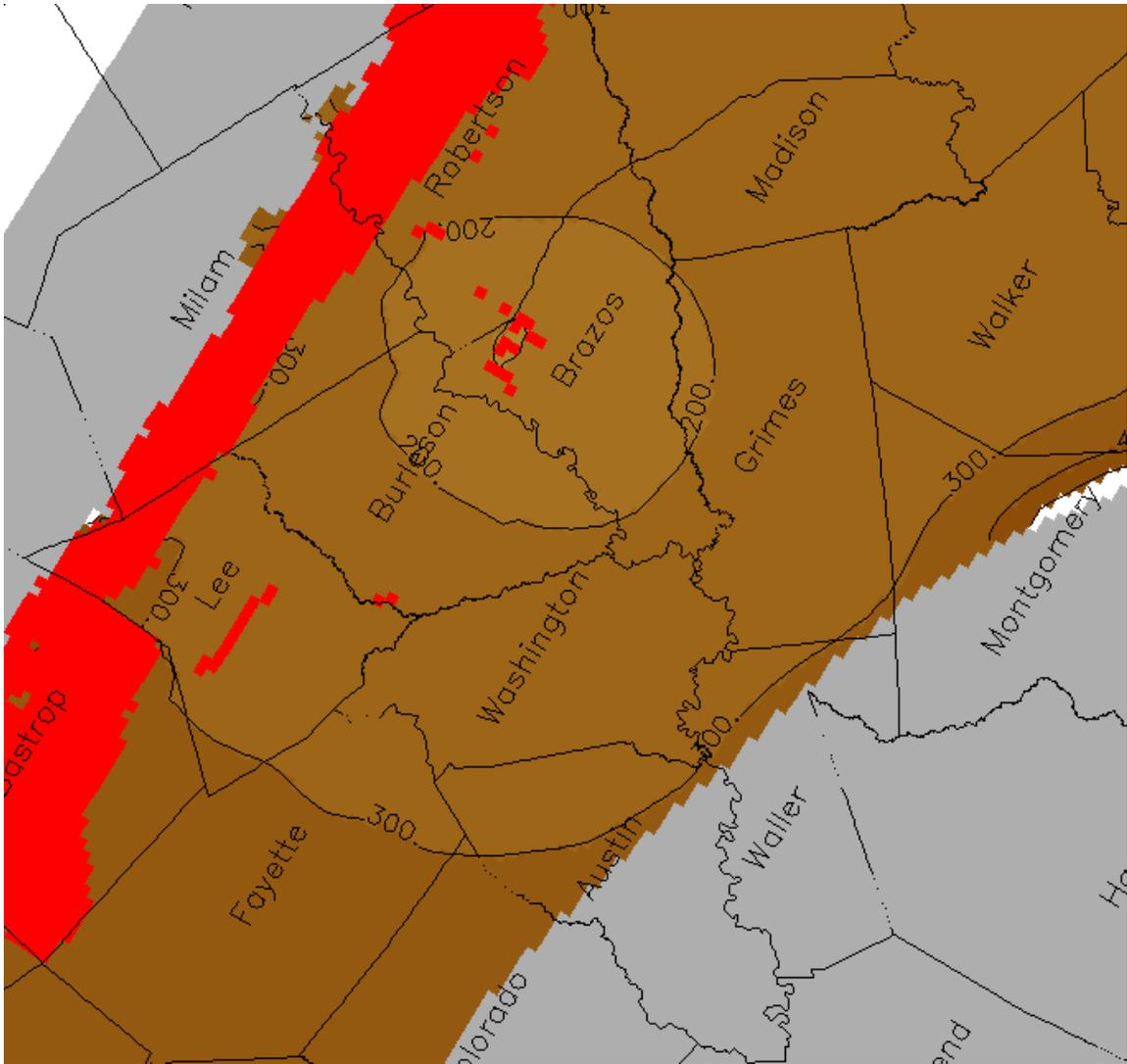


Figure 2. Heads in the Simsboro (feet above sea level) in 2001 before wells were added. Red (or shaded) squares indicate the location of model grid cells with pumping.

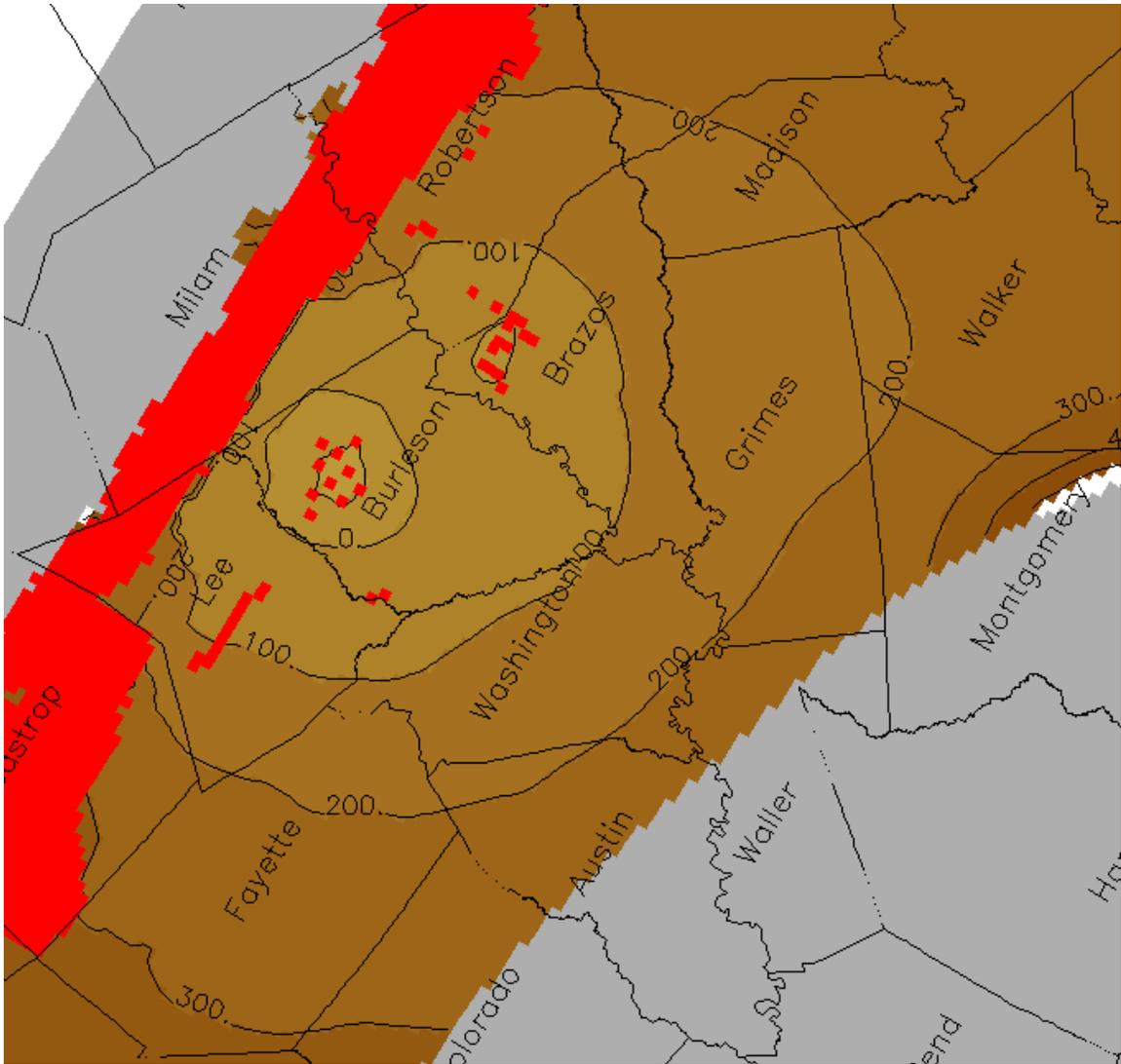


Figure 3. Heads in the Simsboro (positive number indicates feet above sea level; negative number indicates feet below sea level) in 2005 after 10 wells at 3,000 gpm have been added. Heads within the 0 foot contour in northwest Burleson County are below sea level. Red (or shaded) squares indicate the location of model grid cells with pumping.

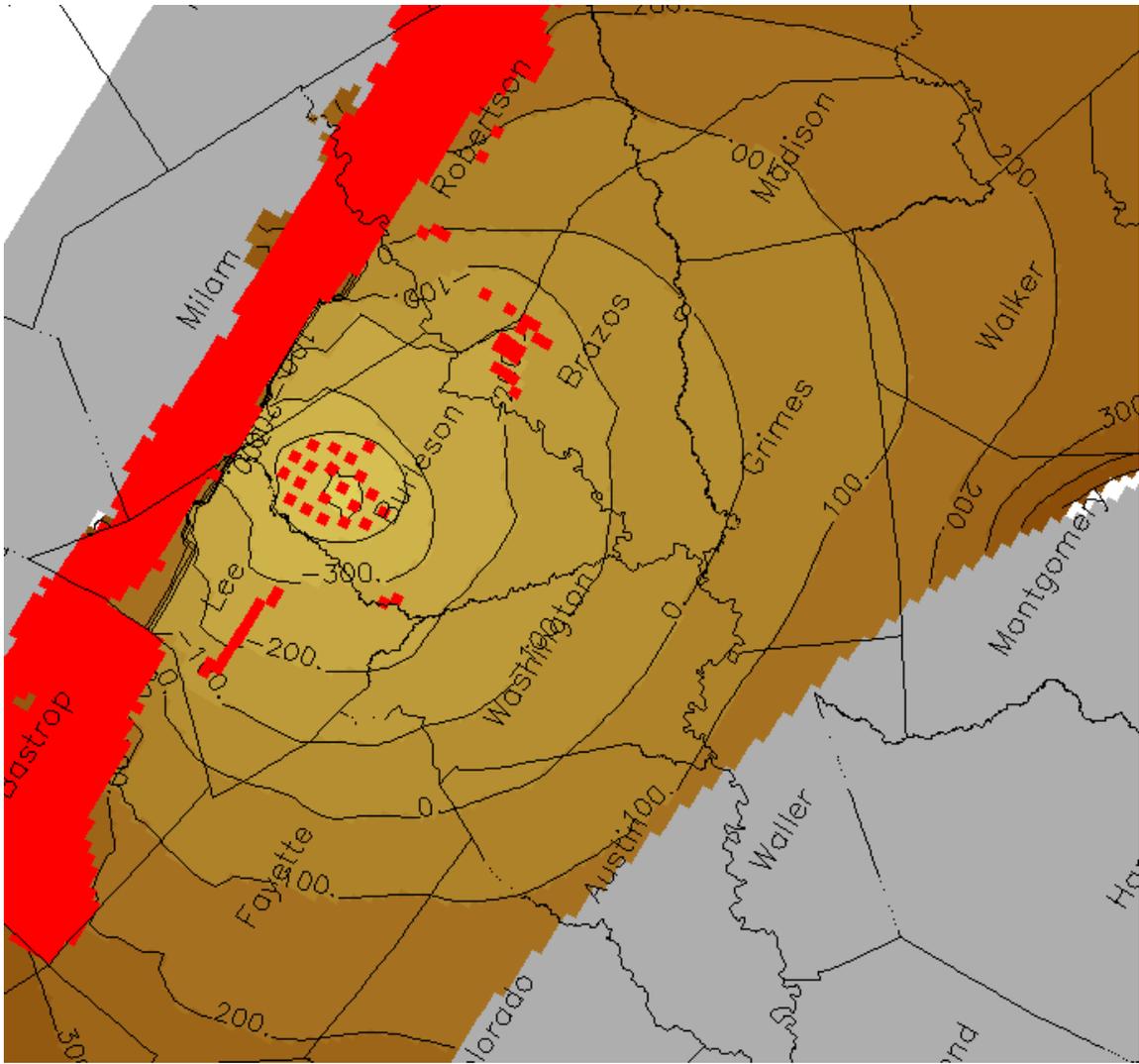


Figure 4. Heads in the Simsboro (positive number indicates feet above sea level; negative number indicates feet below sea level) in 2010 after 20 wells at 3,000 gpm have been added. Red (or shaded) squares indicate the location of model grid cells with pumping.

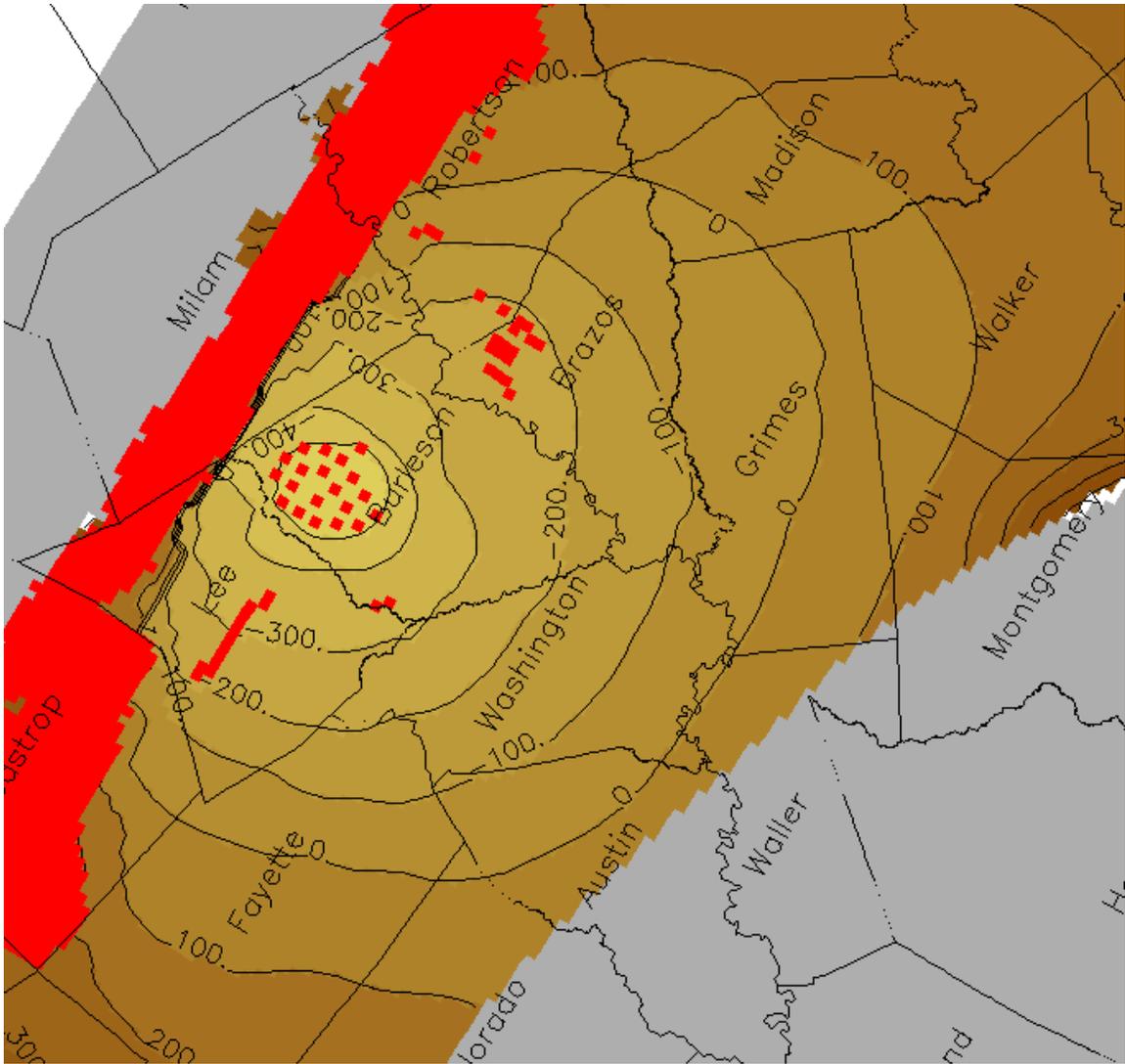


Figure 5. Heads in the Simsboro (positive number indicates feet above sea level; negative number indicates feet below sea level) in 2020 after 10 additional years of pumping. Red (or shaded) squares indicate the location of model grid cells with pumping.

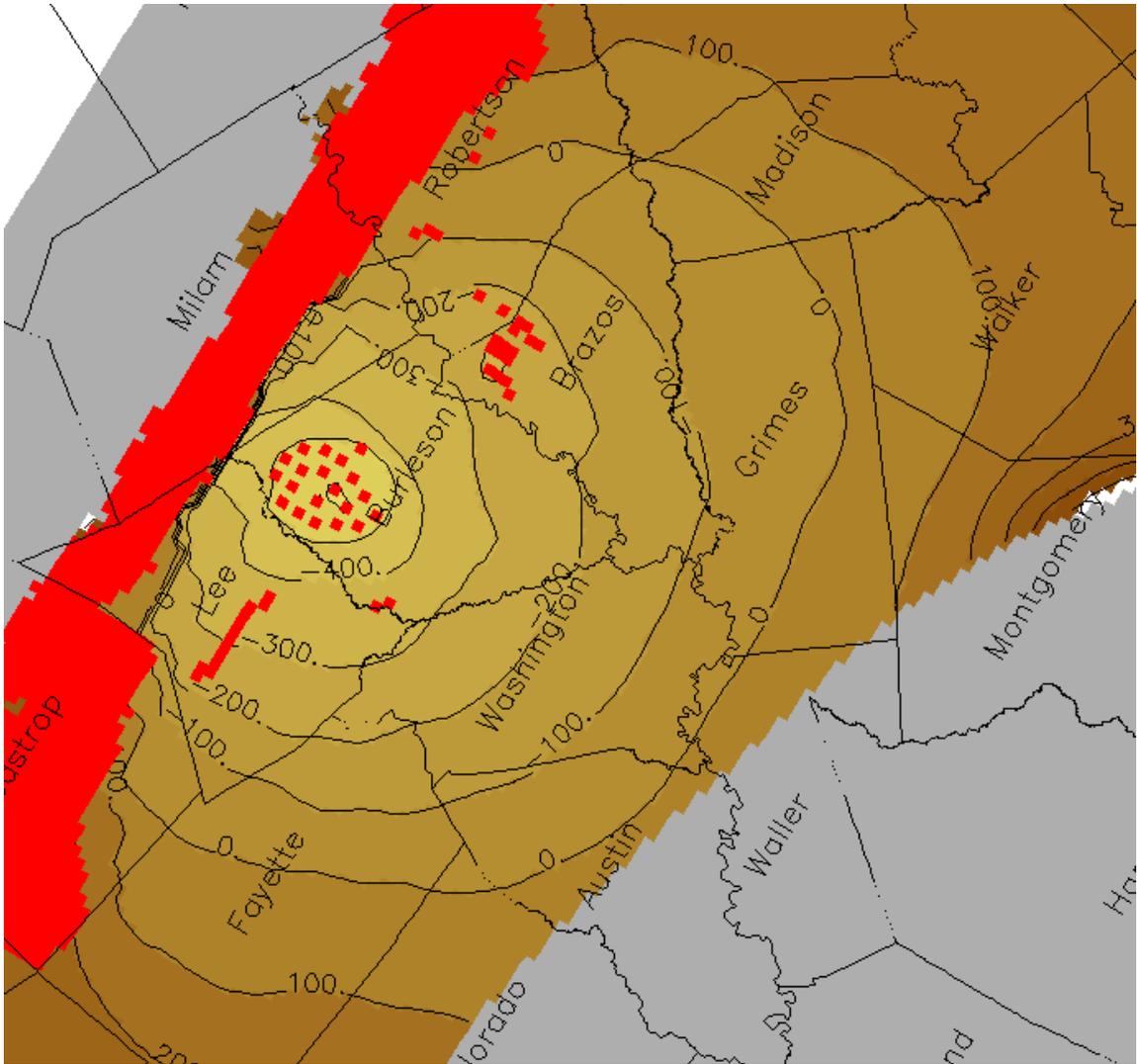


Figure 6. Heads in the Simsboro (positive number indicates feet above sea level; negative number indicates feet below sea level) in 2030 after 20 years of additional pumping. Red (or shaded) squares indicate the location of model grid cells with pumping.