
**GAM RUN 16-030_ADDENDUM:
CULBERSON COUNTY GROUNDWATER
CONSERVATION DISTRICT MODELED
AVAILABLE GROUNDWATER FOR THE
WEST TEXAS BOLSONS AQUIFER**

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June 24, 2020



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EXECUTIVE SUMMARY:

Culberson County Groundwater Conservation District requested via email on June 8, 2020 that the TWDB provide the modeled available groundwater for the West Texas Bolsons Aquifer with their district divided into three geographic areas. The three geographic areas are the Lobo Flat, the Michigan Flat, and the Wild Horse Flat (Figure 1). Culberson County Groundwater Conservation District provided Geographic Information System (GIS) shapefiles for each area.

We used the geographic area shapefiles to update the (GIS) grid file for the groundwater availability model for the Igneous and parts of the West Texas Bolsons Aquifer. In addition, we made small adjustments to the geographic area assignments in the (GIS) grid file to fully capture the extent of the bolsons used for the original modeled available groundwater analysis (Figure 1; Boghici and Bradley, 2018; Oliver, 2011, Oliver, 2010a; Oliver, 2010b). We then used the revised grid to extract the modeled available groundwater values from the previous model results (Table 1).

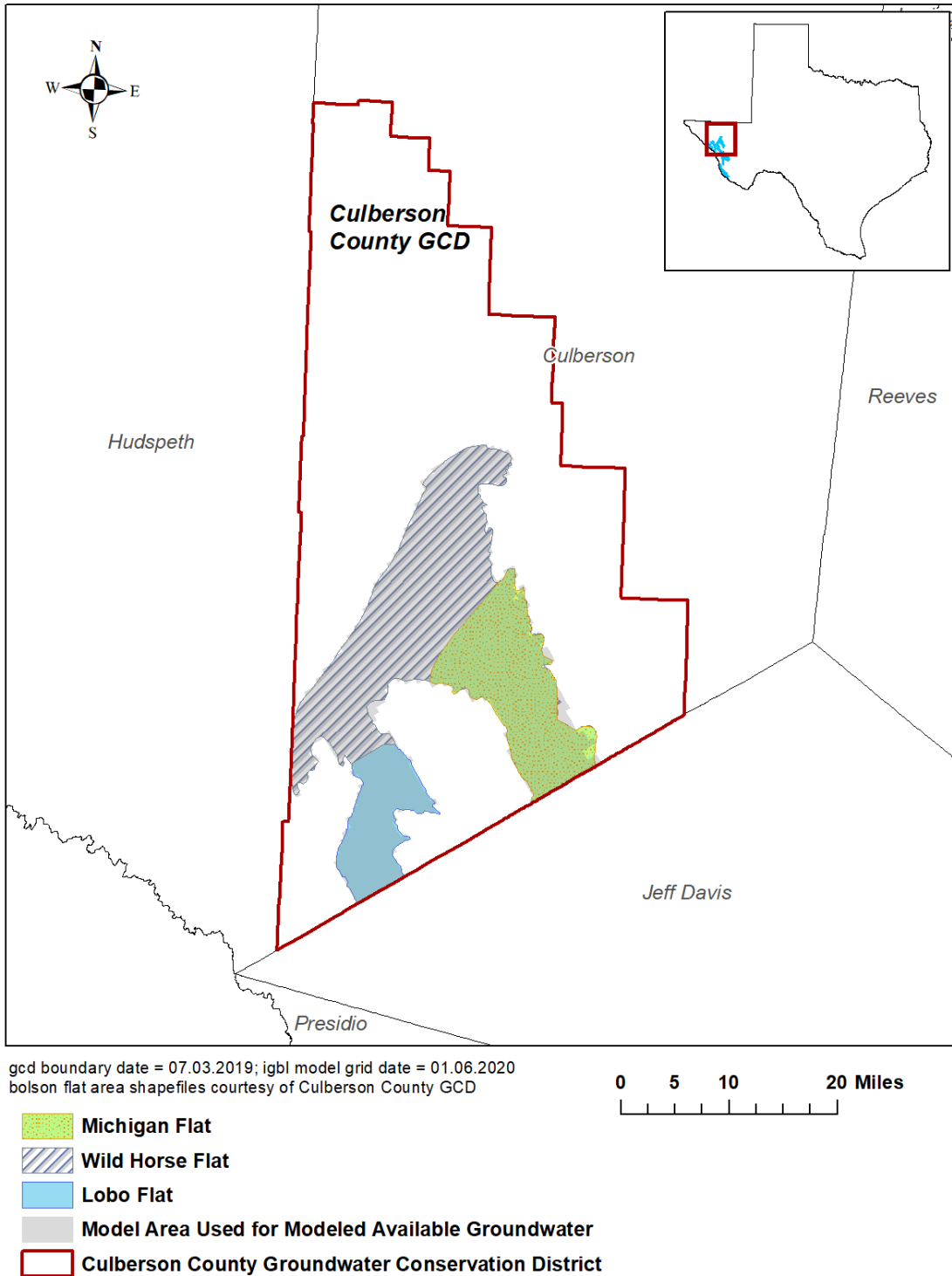


FIGURE 1: LOCATION OF THE GEOGRAPHIC AREAS OF THE WEST TEXAS BOLSONS AQUIFER LOCATED IN CULBERSON COUNTY GROUNDWATER CONSERVATION DISTRICT (GCD).

TABLE 1: MODELED AVAILABLE GROUNDWATER FOR THE WEST TEXAS BOLSONS AQUIFER SPLIT BETWEEN GEOGRAPHIC AREAS IN CULBERSON COUNTY GROUNDWATER CONSERVATION DISTRICT. ALL VALUES ARE REPORTED IN ACRE-FOOT PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

Area	2020	2030	2040	2050	2060
Lobo Flat	11,112	11,112	11,097	11,092	11,087
Wild Horse Flat	20,568	20,542	20,501	20,475	20,455
Michigan Flat	4,071	4,025	4,004	3,984	3,969
Culberson County Groundwater Conservation District Total	35,751	35,679	35,602	35,551	35,510

LIMITATIONS:

The groundwater models used in completing this analysis is the best available scientific tool that can be used to meet the stated objectives. To the extent that this analysis will be used for planning purposes and/or regulatory purposes related to pumping in the past and into the future, it is important to recognize the assumptions and limitations associated with the use of the results. In reviewing the use of models in environmental regulatory decision making, the National Research Council (2007) noted:

“Models will always be constrained by computational limitations, assumptions, and knowledge gaps. They can best be viewed as tools to help inform decisions rather than as machines to generate truth or make decisions. Scientific advances will never make it possible to build a perfect model that accounts for every aspect of reality or to prove that a given model is correct in all respects for a particular regulatory application. These characteristics make evaluation of a regulatory model more complex than solely a comparison of measurement data with model results.”

A key aspect of using the groundwater model to evaluate historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of historic pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and interaction with streams are specific to particular historic time periods.

Because the application of the groundwater models was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations related to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor groundwater pumping and overall conditions of the aquifer. Because of the limitations of the groundwater model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine this analysis in the future given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future. Historic precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

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- Oliver, W., 2010a, GAM Task 10-026 Model Run Report: Texas Water Development Board GAM Task Report, 7 p.,
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