DRILLER GUIDANCE DOCUMENT FOR POST OAK SAVANNAH GCD
REQUIRED WELL DESIGN CRITERIA FOR NEW WELLS TO BE ELIGIBLE FOR FINANCIAL ASSISTANCE FROM THE POSGCD GROUNDWATER WELL ASSISTANCE PROGRAM

1.0 Introduction

The POSGCD established their Groundwater Well Assistance Program (GWAP) to provide technical and/or financial assistance to well owners to help prevent the loss of water supply in wells that meet the GWAP eligibility criteria. Among the current eligibility criteria is that wells drilled after January 1, 2023 be designed and constructed to account for declines in water levels estimated by using the best available science.

The purpose of the document is to provide well design criteria that need to be followed in order for new wells to be eligible for GWAP funding. The current well design criteria specifies the maximum elevation of a pump intake for a wells that pumps the Carrizo-Wilcox Aquifer. The maximum elevation of the pump intake is set to prevent the pump from having to be lowered during the next 30 years because of declines in the water levels. POSGCD anticipated that the updates to the well design criteria will occur as improvements are made in predictions of changes in the water levels. The criteria for pump intake elevation are specific vary among the four aquifers that comprise the Carrizo-Wilcox Aquifer: the Carrizo, Calvert Bluff, Simsboro, and Hooper aquifers. The elevations for the pump intake across Milam and Burleson counties are contained in Geographic Information System (GIS) files that can be downloaded from the POSGCD website.

2.0 Groundwater Assistance Program (GWAP)

Since 2020, POSGCD has provided financial assistance to well owners to lower pumps in 98 wells so that the pumps could continue to produce water for the next few decades. Thus far, POSGCD has covered 100% of the costs to lower the pumps. POSGCD also coordinates the field work with an appropriate drilling firm and supervises the lowering of the pump, reassembly of the pump system, and testing of the pump system. The depths to which pumps are lowered are based primarily on POSGCD most recent predictions of water levels for the next 50 years. The average distance that the pumps intake have been lowered is 160 feet. Approximately 95% of the GWAP wells pump from the Carrizo-Wilcox Aquifer and approximately 90% of the GWAP wells pump from the Carrizo Aquifer. The primary cause of recent water level drawdown in the GWAP wells is pumping from the Vista Ridge well field in western Burleson County. The Vista Ridge well field began production from the Carrizo and Simsboro aquifers in 2020. Since 2020, POSGCD, Lost Pines GCD, and Brazos Valley GCD have received permit application for pumping 10,000 acre-feet/year or more in the Simsboro Aquifer. If the full amount of the permitted production occurs from these permits, POSGCD anticipates that the requests for GWAP funding will continue for several decades.

3.0 Maximum Elevations for Pump Intakes for Wells in the Carrizo-Wilcox Aquifer.

Figures 1 through 4 show contours of the maximum elevation for the pump intake for the Carrizo, Calvert Bluff, Simsboro, and the Hooper aquifers, respectively. The maximum elevation is the highest elevation the pump intake can be set so that the well will be compliant with GWAP eligibility requirements. The contours are based on the groundwater model simulation used in POSGCD's 2022

GWAP Annual Needs Assessment (GANA) report (Young and others, 2022). One of the objectives of the GANA report is to identify wells with the greatest risk of substantial water levels declines over the next decade. Except for some areas near the outcrop of each aquifer, the elevations were determined by subtracting 75 ft from the water level values simulated in 2050.

Figure 5 shows the elevation of the land surface across Milam and Burleson counties. The topographic elevations are needed in order to convert an elevation, which is a measure relative to ocean level, to a depth, which is a measure relative to ground surface. The elevation surfaces in Figures 1 through 5 were generated using GIS files called rasters. Each of the five rasters consists of grid cells that measure 0.25 miles by 0.25. miles. The GIS files are readily accessible on the POSGCD web site and can be used by POSGCD staff for quickly determining the maximum elevation or minimum depth below ground surface for the pump intake. POSGCD anticipates that early in 2023, the web site will have a tool that will determine the maximum elevation or minimum depth below ground surface for pump intake after the user has entered the latitude and longitude of the well location. Until the tool is available for public use, well owners and drillers will need to have POSGCD determine the maximum pump setting elevation for a proposed new well location.

4.0 Process for Certifying of Using the GWAP Well Design Criteria

At the time of the writing of this document, POSGCD is revising its drilling application forms so that there is a traceable paper-trail for certifying that the GWAP criteria for setting the elevation of the pump intake was properly followed. Once completed, the process will include a revised set of POSGCD documents. A summary of the anticipated revision to the current POSGCD documents is as follows:

- a revised Drilling Application Form will require that the well owner/driller acknowledge that GWAP well design criteria needs to be followed for the well to be eligible for GWAP funding
- a revised Certificate to Proceed with Drilling and a revised Drilling Permits will include language that provides the GWAP criteria for the maximum elevation for the pump intake
- a revised Driller's Completion to Permit Application will include a statement regarding whether or not the GWAP well design criteria was followed

5.0 Limitations with Elevation for Pump Intakes

POSGCD acknowledges that there are inherent errors with the current maps of the tops and bottom surfaces of its aquifers and with the GAMs used by POSGCD. Because of these known errors POSGCD has funded two projects. One project is to check and update the current tops and bottoms for Carrizo, Calvert Bluff, Simsboro, and Hooper aquifers based on the analysis of geophysical logs. The other project is to improve the predictive capability /accuracy of the GAM in POSGCD by replacing it with a POSGCD groundwater operation model. Until both of these projects are completed, POSGCD plans to update the pump elevation maps in Figures 1 -4 as new information is becomes available. POSGCD also plans on making adjustments to the well design criteria is the driller or well owner presents a good reason for adjusting the maximum pump elevation determine from interpreting the rasters.

6.0 References

POSGCD (Post Oak Savannah Groundwater Conservation District), 2018. Post Oak Savannah Groundwater Conservation District Groundwater Well Assistance Program (GWAP).

Young, S., Beal, L., and Kushnereit, R., 2022. Draft. Groundwater Assistance Program Annual Needs Assessment 2022. Prepared for Post Oak Savannah Groundwater Conservation District, Prepared by INTERA, Austin, Texas.

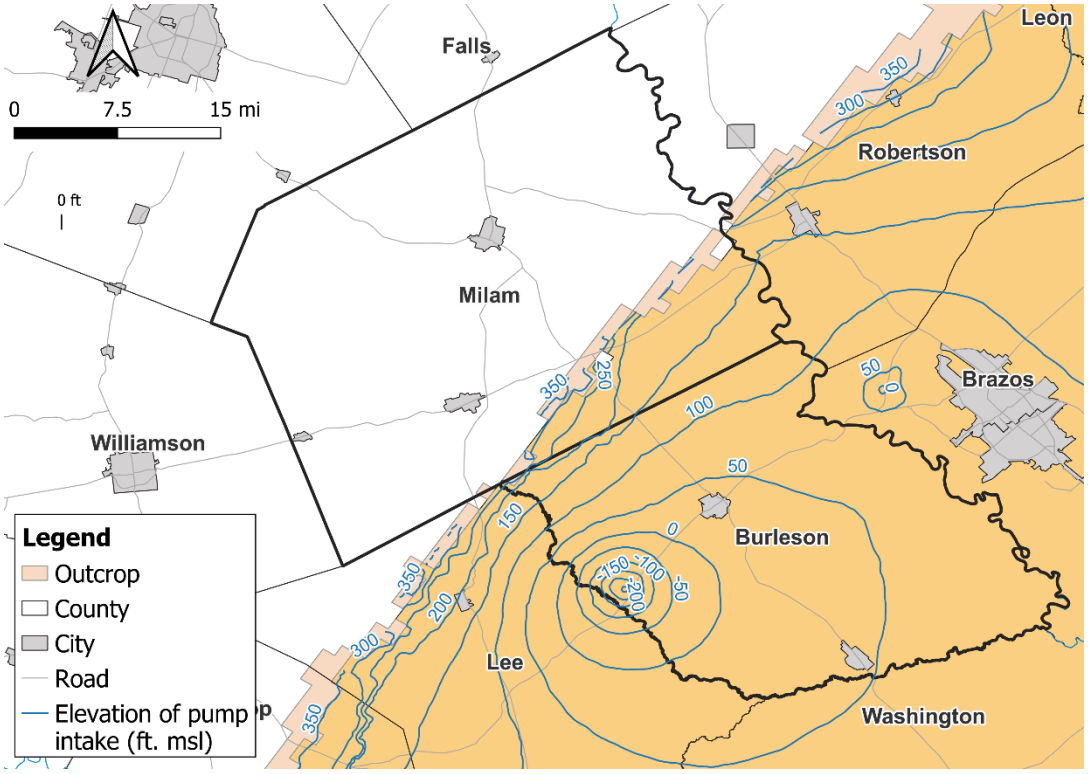

Figure 1 Maximum elevation for pump intake in the Carrizo Aquifer

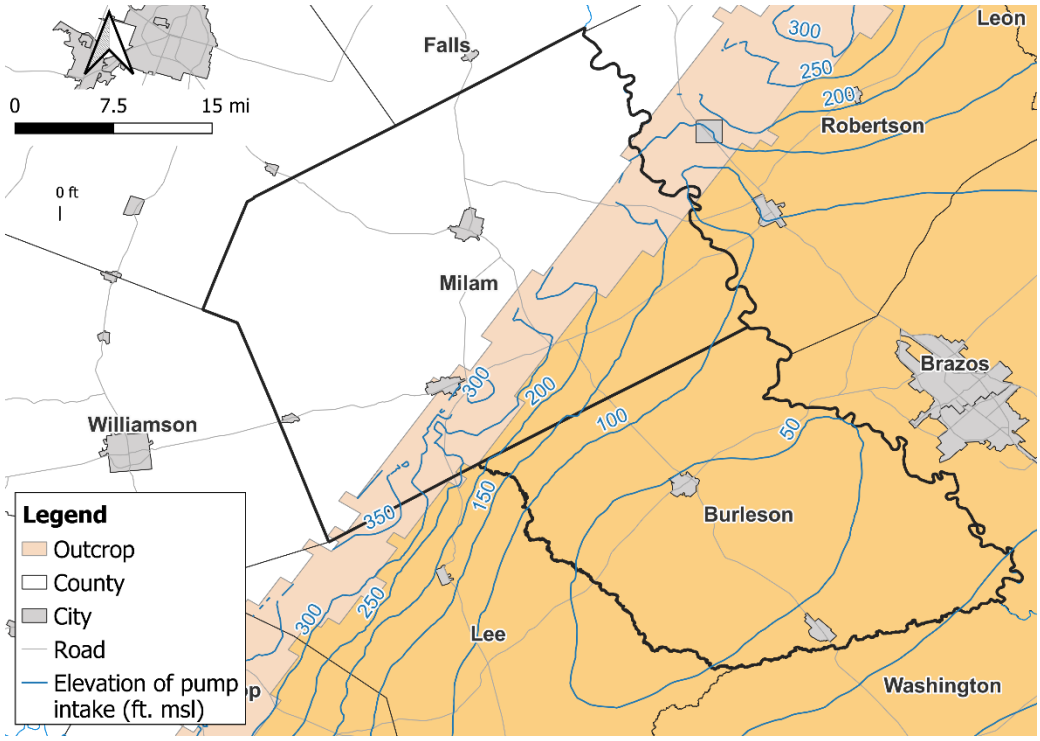

Figure 2 Maximum elevation for pump intake in the Calvert Bluff Aquifer

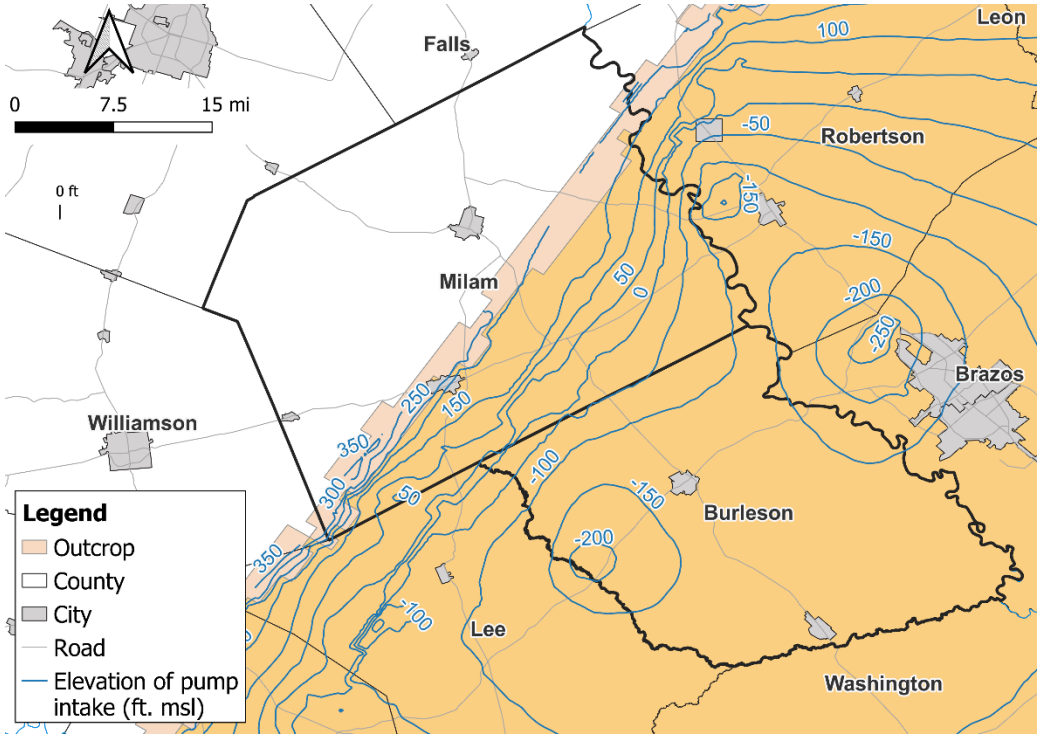

Figure 3. Maximum elevation for pump intake in the Simsboro Aquifer

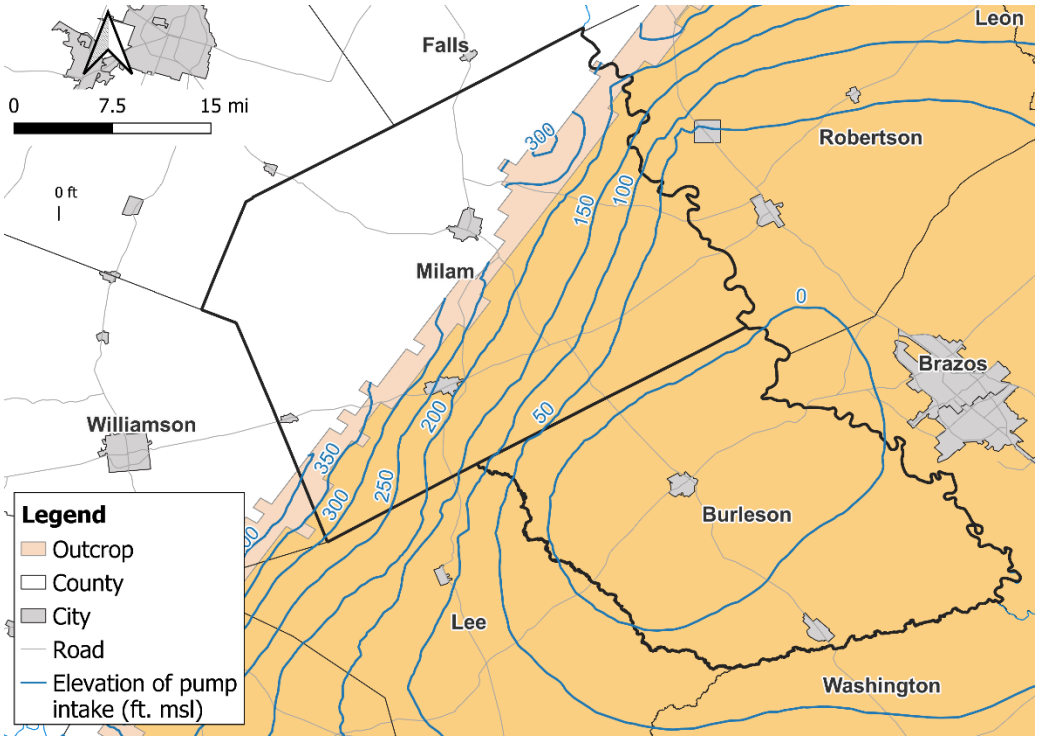

Figure 4. Maximum elevation for pump intake in the Hooper Aquifer

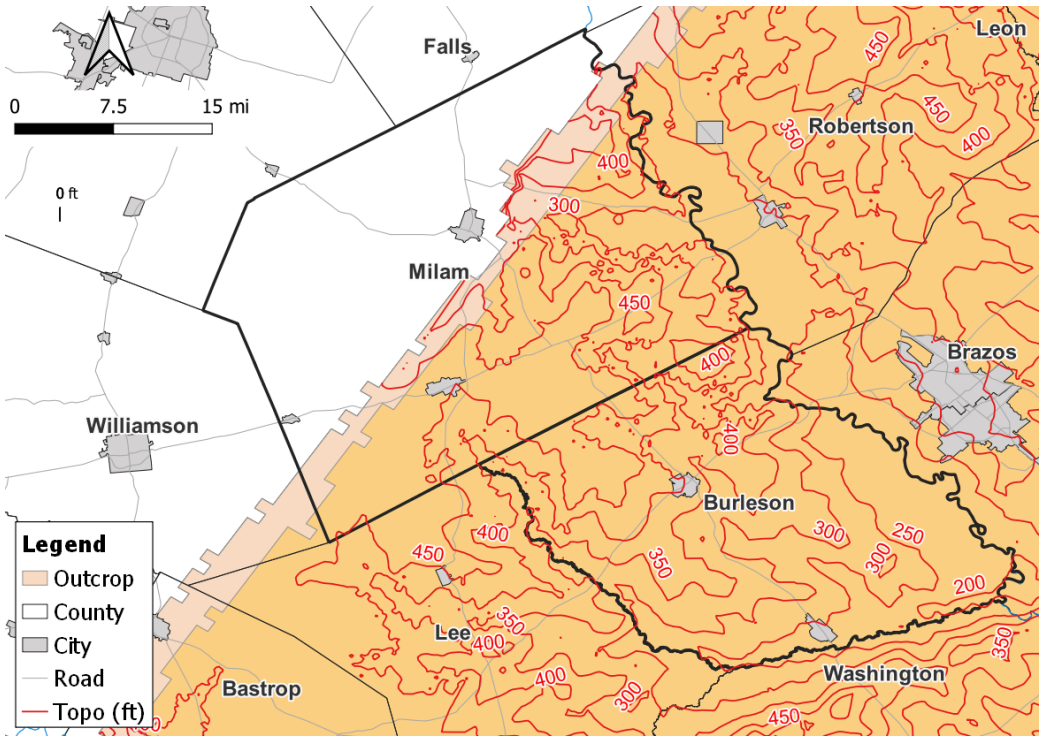

Figure 5. Land Surface Elevation