

Memorandum

To: Texas Water Development Board
From: GMA 12
Date: May 5, 2022
Subject: Calvert Bluff Aquifer in Williamson County

I. INTRODUCTION

The Texas Water Development Board, in its July 2013 document *Explanatory Report for Submittal of Desired Future Conditions to the Texas Water Development Board*, offers the following guidance regarding documentation for aquifers that are to be classified non-relevant for purposes of joint groundwater planning:

Districts in a groundwater management area may, as part of the process for adopting and submitting desired future conditions, propose classification of a portion or portions of a relevant aquifer as non-relevant (31 Texas Administrative Code 356.31 (b)). This proposed classification of an aquifer may be made if the districts determine that aquifer characteristics, groundwater demands, and current groundwater uses do not warrant adoption of a desired future condition.

The districts must submit to the TWDB the following documentation for the portion of the aquifer proposed to be classified as non-relevant:

1. A description, location, and/or map of the aquifer or portion of the aquifer;
2. A summary of aquifer characteristics, groundwater demands, and current groundwater uses, including the total estimated recoverable storage as provided by the TWDB, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifer(s) will not be affected; and
3. An explanation of why the aquifer or portion of the aquifer is non-relevant for joint planning purposes.

This technical memorandum provides the required documentation to classify the Calvert Bluff Aquifer as non-relevant in Williamson County for the purposes of joint groundwater planning.

II. AQUIFER DESCRIPTION AND LOCATION

The Calvert Bluff Aquifer is the uppermost unit within the Wilcox Group, which is part of the Carrizo-Wilcox Aquifer. As described in George and others (2011):

The Carrizo-Wilcox Aquifer is a major aquifer extending from the Louisiana border to the border of Mexico in a wide band adjacent to and northwest of the Gulf Coast Aquifer. It consists of the Wilcox Group and the overlying Carrizo Formation of the Claiborne Group. The aquifer is primarily composed of sand locally interbedded with gravel, silt, clay, and lignite. Although the Carrizo-Wilcox Aquifer reaches 3,000 feet in thickness, the freshwater saturated thickness of the sands averages 670 feet. The groundwater, although hard, is generally fresh and typically contains less than 500 milligrams per liter of total dissolved solids in the outcrop, whereas softer groundwater with total dissolved solids of more than 1,000 milligrams per liter can occur in the subsurface in areas further downdip from the outcrop. High iron and manganese content in excess of secondary drinking water standards is characteristic of the deeper

subsurface portions of the aquifer... Irrigation pumping accounts for slightly more than half the water pumped, and pumping for municipal supply accounts for another 40 percent.

Figure 1 shows the very small areal extent of the Calvert Bluff Aquifer within Williamson County, as well as the location of the active nodes in the Central Carrizo-Wilcox Groundwater Availability Model (GAM). In Williamson County, the Calvert Bluff outcrop covers only a total of 0.55 square miles, is approximately 118 feet thick, and is represented by a part of a single cell. This cell is assigned to Williamson County because the center of the node is located within Williamson County, approximately 200 feet from the Lee-Williamson County line.

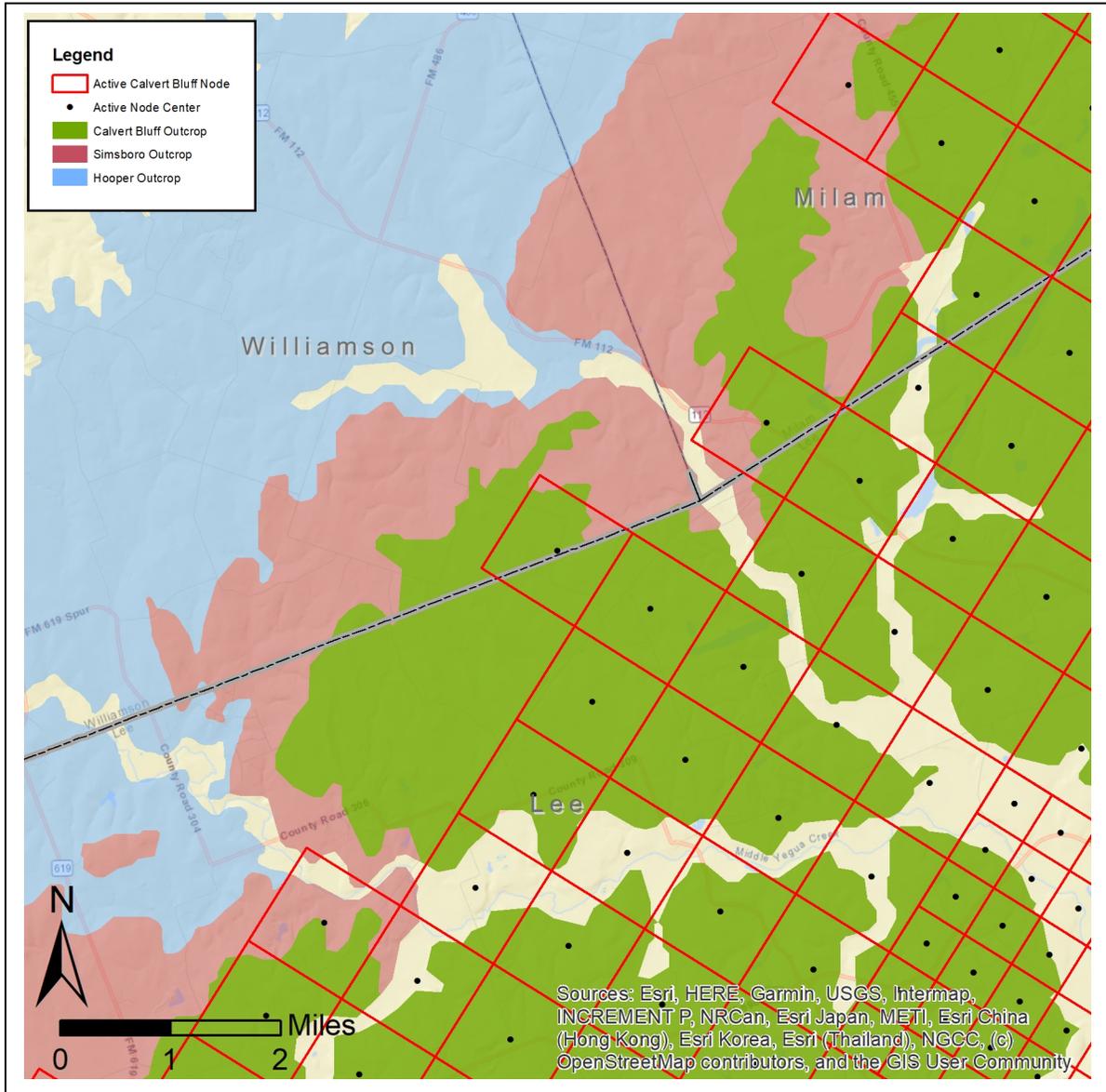


Figure 1. Location of the Calvert Bluff Aquifer in Williamson County

III. AQUIFER CHARACTERISTICS

The Calvert Bluff Formation is comprised primarily of fine to coarse-grained sand and sandstone, interbedded with silt, mudstone, and some lignite. The Calvert Bluff crops out in a band six to eight miles wide in Lee County, across the very southeastern corner of Williamson County, and into Milam County. From the outcrop the Calvert Bluff dips at a rate of 125 to 200 feet per mile to the southeast, although no downdip portions of the aquifer are present in Williamson County. The Calvert Bluff is more productive than the Hooper but not nearly as productive as the underlying Simsboro or overlying Carrizo aquifers. Water quality in the Calvert Bluff is generally good, although water quality deteriorates farther downdip from the outcrop.

IV. GROUNDWATER DEMANDS AND CURRENT GROUNDWATER USES

Because the Calvert Bluff is only present in the uppermost part of its outcrop within Williamson County, it is not certain how many wells exist within Williamson County that are screened in the aquifer. If there are any, they would be very shallow exempt wells.

V. TOTAL ESTIMATED RECOVERABLE STORAGE

Wade and others (2014) developed total estimated recoverable storage for the Carrizo-Wilcox Aquifer in GMA 12 as follows:

<i>County</i>	<i>Total Storage (acre-feet)</i>	<i>25 percent of Total Storage (acre-feet)</i>	<i>75 percent of Total Storage (acre-feet)</i>
Williamson	500,000	125,000	375,000

Total storage is given in the second column, while percentages of storage are given in the third and fourth columns. Total groundwater in storage cannot physically be extracted; for deep aquifer systems the 25 or 75 percent of storage are more probably estimates of feasible extraction volumes.

It is important to note that the total storage estimates above are for the entire Carrizo-Wilcox Aquifer within Williamson County. As noted above, because of the extremely limited extent of the Calvert Bluff Aquifer in Williamson County, only a very small percentage of the storage estimates in the table above will be for the Calvert Bluff Aquifer. We estimate the amount of groundwater in storage in the Calvert Bluff in Williamson County in 2011 to be less than 2,000 acre-feet. We selected 2011 because it is the start of the time period for defining the amount of drawdown associated with the Calvert Bluff DFC. In 2011, the average depth to water was approximately 64 feet below ground surface. We used a specific yield of 0.1 for the Calvert Bluff Aquifer to calculate the amount groundwater in storage.

VI. EXPLANATION OF NON-RELEVANCE

Due to its extremely limited areal extent of the aquifer within Williamson County which is only the outcrop portion of the aquifer, the Calvert Bluff Aquifer has been classified as non-relevant for purposes of joint planning in Groundwater Management Area 12.

VII. REFERENCES

George, P.G., Mace, R.E., and Petrossian, R., 2011, Aquifers of Texas, Texas Water Development Board Report 380, July 2011, 182p.

Wade, S. and Shi, J., 2014, GAM Task 13-035 Version 2: Total Estimated Recoverable Storage for Aquifers in Groundwater Management Area 12, Texas Water Development Board, Groundwater Resources Division, May 16, 2014, 43p.