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VIA ELECTRONIC MAIL

December 3, 2018

Mr. Alan Day
General Manager
Brazos Valley Groundwater Conservation District
P.O. Box 528
Hearne, Texas 77859
aday@brazosvalleygcd.org

Re: Review of Aquifer Impact Assessment for Circle X Ranch Permit Application – Three (3)
Proposed Simsboro Wells, Robertson County, Texas

Dear Mr. Day:

Our firm has reviewed a report submitted by Circle X Land and Cattle, LTD regarding the potential impacts from pumping three wells screening sands of the Simsboro Aquifer and located in the northeast part of Robertson County. The report was prepared by The Thornhill Group, Inc. (TGI) and submitted to address Brazos Valley GCD Rule 8.4(b)(7)(B) for wells capable of producing 800 or more acre-feet per year (ac-ft/yr).

The permit application for the three wells is for an overall withdrawal amount of 9,678 ac-ft/yr, which is equivalent to an average pumping rate of 6,000 gallons per minute (gpm) continuously for one year. The proposed locations for the wells are shown on the attached figure, which was provided as part of the hydrogeological evaluation report.

Our comments regarding the report for the three large-capacity wells are included below.

1. As required by the rule referenced previously, the evaluation report addresses the surface geology in proximity to the proposed locations for the wells and the surface geology in the general area extending a few to several miles from the wells. The report also addresses the depth of the proposed interval that would be screened by the wells and the thickness of the Simsboro Aquifer in the general area. The report also addresses the question regarding whether the aquifer is confined or unconfined and it is confined in this area with several hundred feet of artesian head above the top of the aquifer. The proposed wells are intended to screen sands of the Simsboro Aquifer, which occur in the depth interval from about 900 to potentially 1,300 feet with the interval approximately 80 percent sand, concentrated in two thick sand packages within the interval. The hydrologic or hydrogeologic features within one mile of the proposed well sites also are discussed with data indicating that the Simsboro Aquifer has similar characteristics within at least a few miles of the proposed well locations as occur at the proposed well sites.
2. As required by the Rule 8.4(b)(7)(B)(2), a table is provided regarding water wells that are located within one mile of the proposed well locations. There are two registered wells that occur within the one-mile radius area. One well listed, BVR-0484, is located about 3,000 feet northeast of

proposed Simsboro Production Well No. 3. The well is listed in the BVGCD database as screening sands of the Simsboro Aquifer. With the well having a reported total depth of 300 feet, the well would actually screen sands of the Calvert Bluff Aquifer. The aquifer designation has been corrected for the well. A map showing the locations of the wells also is included.

3. As required by Rule 8.4(b)(7)(B)(3), the report includes estimates of the interference drawdown that could be caused by pumping the three wells at rates of 2,000 gpm each continuously for one year and ten years. The estimates of interference drawdown extend out at least five miles from the wells. The estimates were calculated using two methods. One, using the Queen City/Sparta Groundwater Availability Model (GAM) and a second one, using an analytical model. The estimated interference drawdown effects range from 35 to about 90 feet at five miles from the wells after 10 years of pumping. This estimate is based on the Queen City/Sparta GAM developed in 2004. The interference drawdown effect within about one mile of the wells could reach about 200 to 400 with the magnitude influenced by pumping located in one cell with a low transmissivity value. Based on review of the results, it appears that the GAM could be overestimating the interference drawdown effects that occur within a mile or so of the wells due to aquifer transmissivity being underestimated in the model in proximity to the proposed wells compared to the aquifer sand thickness that occurs in the area, which indicates a higher transmissivity value.

With the analytical approach used, the estimate of interference drawdown in close proximity to the wells could be a better representation of what might occur. In summary, the GAM could be providing a better estimate of the amount of interference drawdown at distance from the wells with the analytical model providing better estimates close to the wells.

The actual amount of interference drawdown that will occur with the pumping should be monitored using data from the District water-level monitoring program.

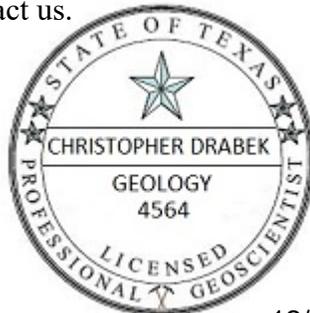
4. WSP performed model simulations with the Queen City/Sparta GAM using the same amount of pumping in the same locations as in the permit application for the same one and ten year durations as simulated by TGI and obtained results that were very similar to the results presented by TGI. WSP reserves the right to perform additional model simulations and review the results in the future when the revised Queen City/Sparta GAM is available.
5. The evaluation report, in general, addresses the requirements of Rule 8.4(b)(7)(B).

If you have questions concerning our review or require other information that we can provide, please do not hesitate to contact us.

Sincerely,

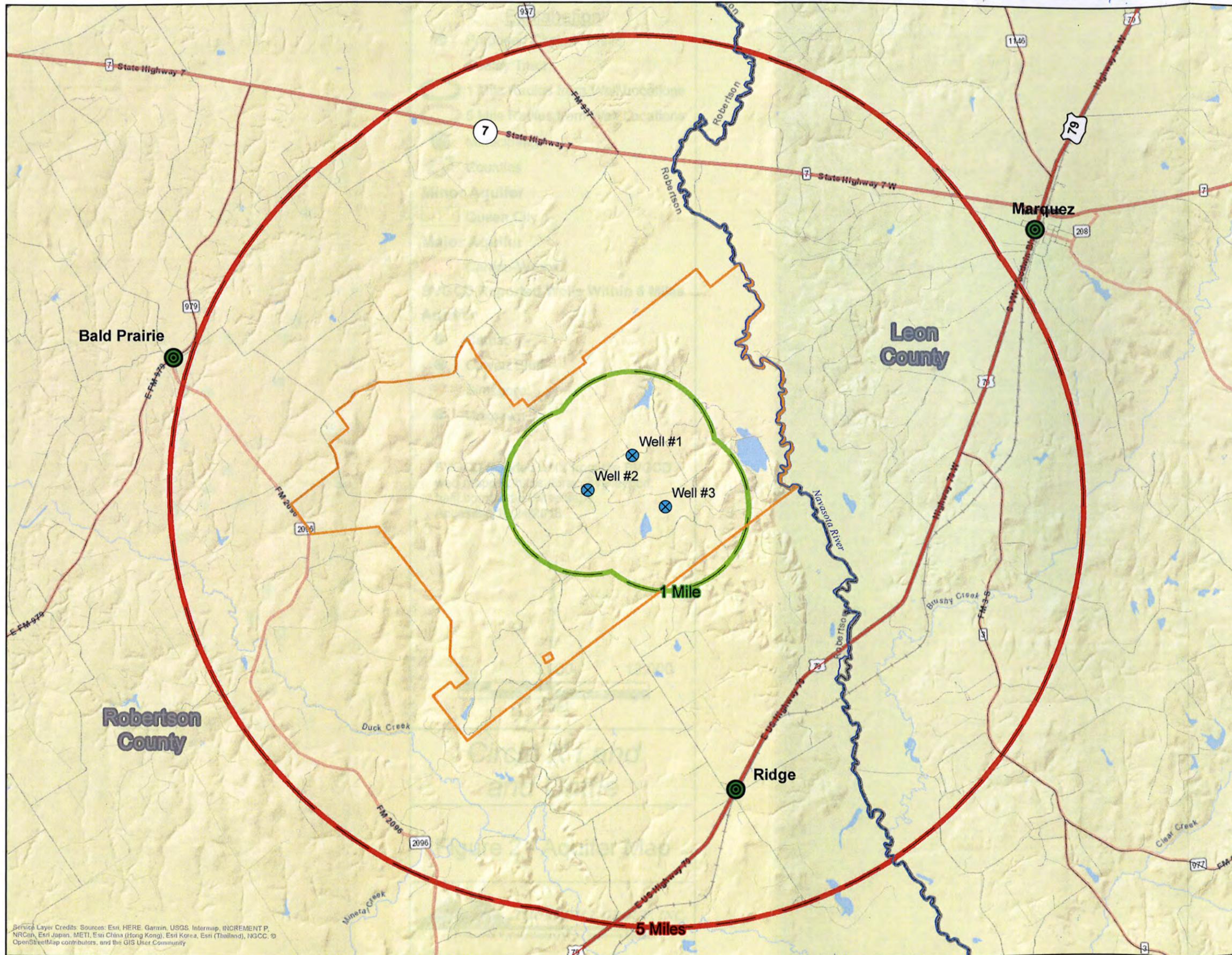


Christopher Drabek, P.G.
Project Hydrogeologist



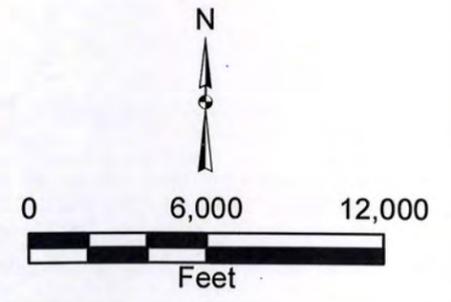
Enclosures

12/3/2018



Explanation

- Proposed Circle X Wells
- Cooley Tract
- 1 Mile Radius from Well Locations
- 5 Mile Radius from Well Locations
- Municipality
- Counties



Circle X Land and Cattle

Figure 1 - Location Map

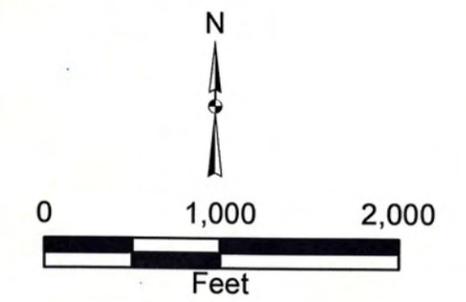


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- Explanation**
- Proposed Circle X Wells
 - Cooley Tract
 - 1 Mile Radius from Well Locations
 - 5 Mile Radius from Well Locations
 - Counties
- BVGCD Reported Wells Within 5 Miles**
- Aquifer**
- Simsboro
 - Other Formation

BVGCD reported wells from the BVGCD web mapper: <https://brazosvalleygcd.half.com/portal1/Map.aspx>
 Accessed 10/24/2018



Circle X Land and Cattle

Figure 5b - Well Locations Within 1 Mile of Proposed Circle X Wells



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