



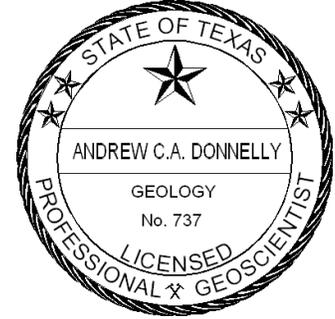
Memorandum

To: Jim Totten, General Manager
Lost Pines Groundwater Conservation District

From: Andrew Donnelly

Date: January 25, 2022

Subject: Review of City of Bastrop Operating Permit Application Packet



We have reviewed the operating permit application packet submitted by the City of Bastrop (City) for three new wells on the XS Ranch. After completion of the three new wells, the well field will consist of four wells located along State Highway 95 north of the City. The locations of the proposed and existing production and test wells are shown in Figure 1.

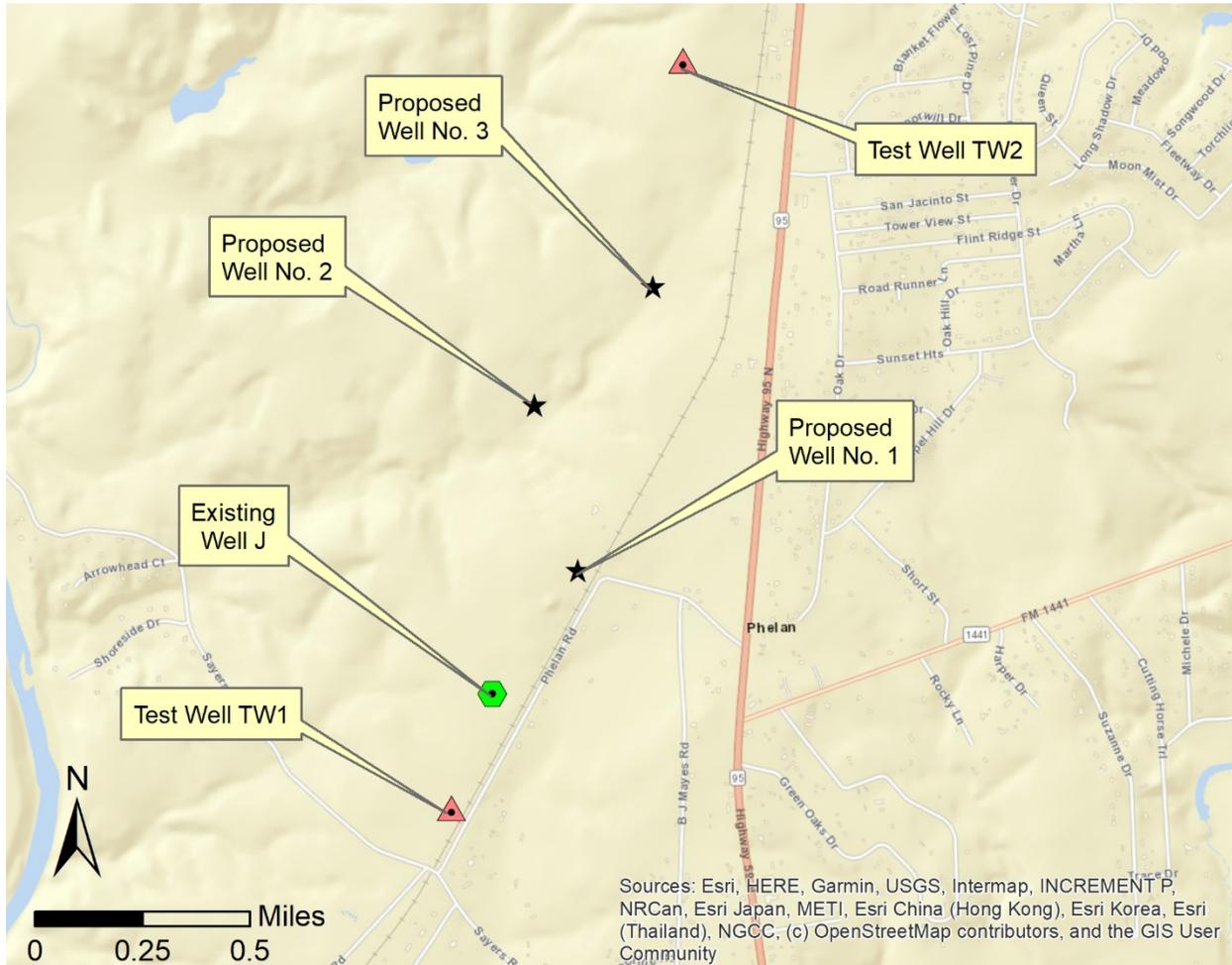


Figure 1. Location of existing and proposed City of Bastrop wells.



Three applications are included as part of this submittal, one for each of the three proposed wells that will make up the full City well field. Supporting material for each of these applications is identical, and so one review is sufficient to consider the three applications.

As shown in Figure 2, the location of the proposed well field is just to the southwest of the existing Aqua Camp Swift well field, which produces water from the Simsboro Aquifer. The closest of the proposed City wells is slightly more than one mile from the Aqua CS-5 well. The proposed City well field is also approximately 2 miles west of the LCRA well field near Lake Bastrop. In addition to these permitted wells, the proposed wells are as close as approximately 2,000 feet from an exempt well owned by Oswald Sanchez that produces from the Simsboro Aquifer (Figure 2). However, the City included a variance letter from Mr. Sanchez in their permit applications indicating that he is not opposed to the proposed City wells.

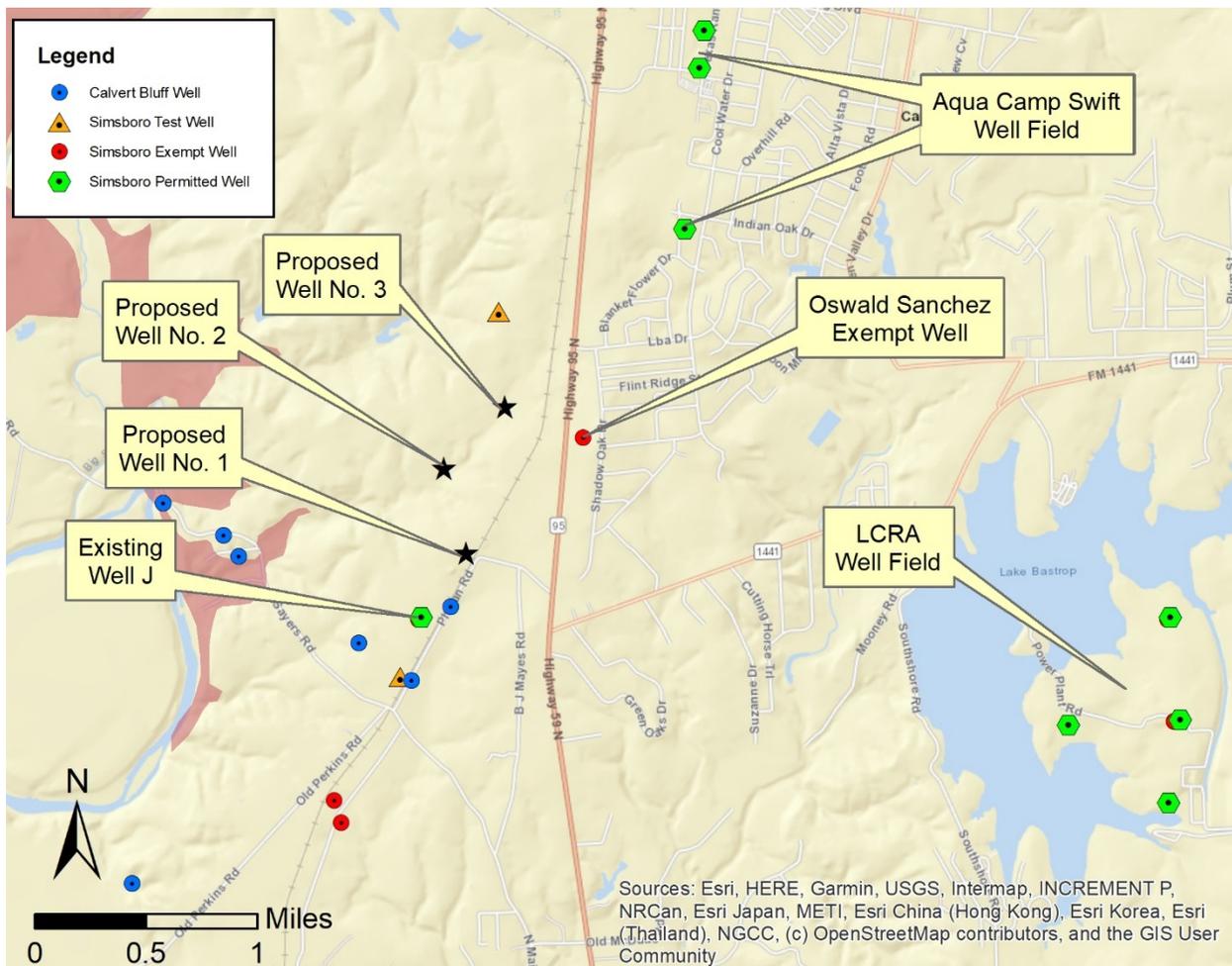


Figure 2. Location of the proposed City of Bastrop wells and nearby Simsboro wells.

The updated Central Queen City-Sparta Groundwater Availability Model (GAM) was run with the proposed pumping of 4,000 acre-feet per year (ac-ft/yr) added in the nodes where the proposed wells are located. The results of this simulation are provided in Figure 3, which illustrates that at



the end of 50 years of continuous pumping, the project-specific drawdown attributable to the three new proposed wells (i.e., drawdown caused by the pumping from the proposed wells only) is approximately 25 feet at the well field location. The model run also indicates that the Aqua Camp Swift wells may experience 15 to 20 feet of drawdown due to the pumping from the three proposed City of Bastrop wells, and that the LCRA wells may experience 10 to 15 feet of drawdown due to the proposed City pumpage.

It is important to understand that the predicted water level declines are estimates made using the GAM, which was developed to assess groundwater impacts on a regional basis and may not account for local hydrogeologic conditions. A review of the aquifer properties of the Simsboro Aquifer in the XS Ranch well field area indicates that the GAM includes aquifer transmissivities that are 50 to 100 percent higher than those estimated based on aquifer tests included with the City of Bastrop applications. Aquifer storativity values in the GAM are consistent with those calculated from the pumping tests. The higher transmissivities in the GAM will result in lower predicted drawdowns in the vicinity of the well field relative to those that may occur in reality. However, it is reasonable to assume that the pumping from the three proposed City of Bastrop wells would result in several tens of feet of drawdown in the Aqua Camp Swift well field, and slightly less in the LCRA well field area.

The simulation results are provided in anticipation that they may be useful to the District Board. This model run was done in the same manner as previous model runs for permit evaluations requested by the Board, so a direct comparison to previous runs can be made. However, it should be noted that the previous evaluation on the City of Bastrop Well J permit application was conducted using the prior version of the GAM, which produces significantly different results than the updated GAM used in this evaluation. In general, the updated GAM simulates less drawdown in the Simsboro Aquifer than the original version of the GAM.

Required Application Items

All items required in an operating permit application are present in these applications.

Permit Review Items 2 and 8

(2) Whether the proposed use of water unreasonably affects existing groundwater and surface water resources or existing permit holders

The proposed additional production of 4,000 ac-ft/yr by the City from the three proposed wells in Bastrop County will impact water levels in the Simsboro Aquifer. Drawdowns for the entire Lost Pines GCD estimated using the GAM are summarized in Table 1. As indicated in the table, the average drawdown estimated to occur due to the proposed well field is approximately 7 feet across the entire District. A map of project-specific drawdowns

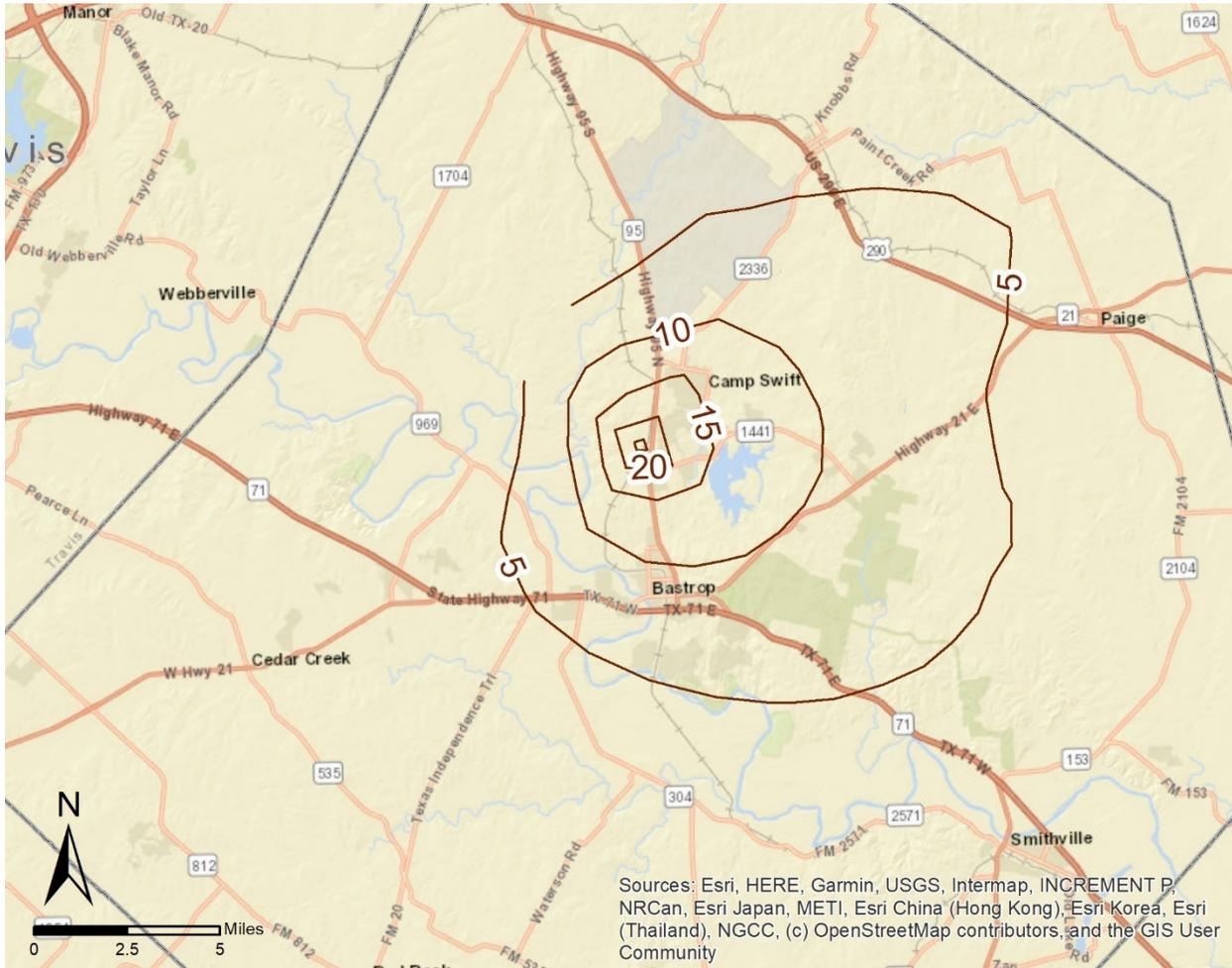


Figure 3. Fifty-year drawdown (in feet) in the Simsboro Aquifer attributable to the proposed City of Bastrop pumpage

estimated using the GAM is shown in Figure 3. This proposed project does not appear to unreasonably impact groundwater users in the District.

Table 1. Projected Simsboro Aquifer drawdown (in feet) in the Lost Pines GCD in 2070 from pumping included in the City of Bastrop well applications

Pumpage	Drawdown (feet)
Proposed City of Bastrop pumping only	7
Proposed City of Bastrop pumping + Existing Lost Pines GCD pumping + New permits	247

A quantitative evaluation of the direct impact of the proposed pumping on surface water resources within the District is difficult to make. However, because the proposed wells are part of the City of Bastrop’s effort to shift their water supply from the wells they currently have that



produce from the Colorado River alluvium to the Simsboro Aquifer, approval of this permit would lead to smaller depletions of Colorado River flows due to groundwater pumping.

(8) Whether granting the application is consistent with the District's duty to manage total groundwater production on a long-term basis to achieve the applicable Desired Future Condition

This project by itself does not cause more estimated drawdown than the Desired Future Condition (DFC) for the Simsboro Aquifer. The average estimated drawdown due to production from these applications is approximately 7 feet when averaged across the entire District. However, production from the three proposed wells combined with existing sources of groundwater production, other approved permits in the District, and groundwater production outside of the District (as modeled in the final Groundwater Management Area 12 GAM run) is estimated to cause 247 feet of drawdown in the aquifer. This value is greater than the DFC for the Simsboro Aquifer in the District, which is 240 feet.

The District's duty to manage total groundwater production on a long-term basis to achieve the DFC will be based on a monitoring network that will be developed for each aquifer for which a DFC has been established. The District's intended approach is to diligently monitor the drawdown within the Simsboro Aquifer across the entire District and manage (i.e., reduce) groundwater production when and if information from the monitoring network indicates that the DFC may be exceeded. If water levels in the Simsboro Aquifer monitoring network indicate the potential for the DFC to be exceeded, then the District's approach is to cut back production for all permitted users. This approach is consistent with the requirement that the DFC be achieved.

Summary

The City of Bastrop submitted applications for three proposed wells that will produce a total of 4,000 ac-ft/yr from the Simsboro Aquifer in Bastrop County. These wells will be aggregated with the City's existing Well J, for a total potential production of 6,000 ac-ft/yr from all four wells in the well field.

The Central Queen City-Sparta GAM was applied to simulate the impact of the proposed City pumping from the three new wells on Simsboro Aquifer water levels; the same assumptions as those applied in previous permit evaluations requested by the District Board were used. The simulated impact of the proposed well field is less than 20 feet on nearby permitted Simsboro Aquifer wells. Localized drawdowns may be slightly underestimated by the GAM due to differences in the aquifer properties used in the model and those estimates by on-site pumping tests. The estimated additional drawdown in the Simsboro Aquifer due to the proposed wells when averaged across the District is approximately 7 feet. Because these wells are intended to



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eliminate pumping from wells currently producing from the Colorado River alluvium, approval of these permits should have a positive impact on flow in the Colorado River.