

## **Proposal to Identify Tops & Bottoms and Sand & Clay Layers for Selected Aquifers in Milam and Burleson Counties**

**Objective:** Assemble and analyze geophysical logs to develop surfaces for the top and bottom of the Sparta, Queen City, Carrizo, Calvert Bluff, Simsboro, and Hooper aquifers for Milam and Burleson counties. Use the newly defined surfaces for assigning wells to support DFC compliance and permit evaluations. INTERA will coordinate the work with Brazos Valley GCD, Lost Pines GCD, GMA 12, and the TWDB.

**Scope of work:** Two levels of SOW are provided for consideration by POSGCD. Level 1 provides the information necessary for assigning wells to specific aquifers. Level 2 provides information that will improve POSGCD's capability to characterize and model groundwater flow in different management zones.

**Level 1. Defining Top and Bottom Boundaries for Aquifers (cost- \$35,000):** Approximately 100 geophysical logs will be assembled and entered into POSGCD well database. On each log, INTERA will pick the top and bottom elevations for the Sparta, Queen City, Carrizo, Calvert Bluff, Simsboro, and Hooper aquifers. The picks will be used to develop continuous surfaces for the tops and bottoms of the aquifers. The surfaces will be used to assign monitoring wells to aquifers. The surfaces will be checked with aquifer boundaries developed by the Brazos Valley GCD and the boundaries in the TWDB Brackish Resources Aquifer Characterization System (BRACS) database.

**Level 2. Defining Sands and Clays Profiles through the Aquifers (additional cost \$30,000)** For the logs used in the Level 1 Study, the sands and clays layers will be identified at a 1-foot resolution for the Sparta, Queen City, Carrizo, Calvert Bluff, Simsboro, and Hooper aquifers. The sand and clay picks will support future estimates of aquifer properties for evaluation of permit applications and GAM updates and evaluations. The sand and clay picks will also be used to evaluate the level of hydraulic separation that exists between formations that comprise the Carrizo-Wilcox Aquifer. At least three detailed aquifer vertical cross-sections for POSGCD will be developed that will be similar to the cross-sections that INTERA as developed for Evergreen Underground WCD (Lupton and others, 2016; Young and others, 2018) for the Yegua-Jackson, Sparta, Queen City, Carrizo, Calvert Bluff, Simsboro, and Hooper aquifers.

**Background Information:** A critical aspect of POSGCD's methodology (INTERA, 2018) for evaluating DFCs compliance is the appropriate assignment of measured water levels to aquifers. The current protocols used by the POSGCD methodology using the aquifers information in the TWDB groundwater availability models (GAM) for well assignment. During the recent update of the GMA 12 GAM for the Sparta, Queen City, and Carrizo-Wilcox aquifers, several significant problems were discovered with the thickness of the Simsboro aquifer in Burleson and Milam counties. Two of these locations included wells for the Vista Ridge project and POSGCD's monitoring well known as the Gause well. At these two locations, the GAM had the Simsboro thickness at 100 feet but interpretation of nearby geophysical wells by INTERA indicated the Simsboro thickness was 500 feet. The changes were significant enough to relocate wells from the Calvert Bluff Aquifer to the Simsboro Aquifer.

**Rationale:** The TWDB has neither the geophysical logs nor the data points used to create surfaces that define the top and bottom of the Sparta, Queen City, and Carrizo-Wilcox aquifers for the GMA 12 GAM. Recent review of the GAM aquifer surfaces by INTERA and other GMA 12 consultants have identified problems with mapping the thickness, top elevation, and bottom elevations for Simsboro Aquifer. Among the reasons for POSGCD to perform the work are: 1) the information is needed for improve the accuracy and legal defensibility of POSGCD's evaluation of DFC compliance and permit evaluations; 2) there are no plans for TWDB to perform the geophysical work in the near future, 3) . TWDB staff recognizes the responsibility of local GCDs to develop programs for the purpose of monitoring compliance with DFCs (French, 2015); and, 4) this work will complement the similar work already performed by Brazos Valley GCD for Robertson and Brazos counties.