

SUMMARY: IDENTIFYING THE VULNERABILITY OF THE MAJOR AND MINOR AQUIFERS OF TEXAS TO SUBSIDENCE WITH REGARD TO GROUNDWATER PUMPING

OVERVIEW

The team of LRE Water, LLC, GLS Solutions, Inc., Wet Rock Groundwater Services, LLC, and Blanton & Associates, Inc. (LRE Team) was retained by the Texas Water Development Board (TWDB) to identify the vulnerability of the major and minor aquifers of Texas to subsidence due to groundwater pumping (Project).

PROJECT SUMMARY

The Project will assist with managing groundwater resources by identifying areas at risk of aquifer subsidence. The Project does not include evaluating subsidence risk in the areas covered by the Harris-Galveston Subsidence District or the Fort Bend Subsidence District.

Through comprehensive data collection and analysis, the LRE Team will prepare a report on the subsidence risk of each major and minor aquifer in Texas. We will present the results on a qualitative risk matrix as well as in map form.

Where technically feasible, the LRE Team will produce subsidence prediction tools for the aquifers identified to be at risk of possible subsidence due to pumping. We will design these tools to be compatible with and eventually work in conjunction with the adopted Groundwater Availability Models (GAMs). In identified subsidence risk areas, these tools will allow the Groundwater Management Areas to use the GAMs to correlate projected pumping and drawdown to estimate subsidence in support of the Desired Future Conditions process. The final report will also provide recommendations on data collection and appropriate subsidence monitoring methods for each aquifer with the potential for subsidence.

To conduct this statewide assessment, the LRE Team will use groundwater data resources that include the TWDB Groundwater Database (GWDB), Texas Department of Licensing and Regulation's (TDLR) Submitted Driller's Report Database (SDR), TWDB water level data, and TWDB's Brackish Resources Aquifer Characterization System (BRACS) Database.

The data types to be considered include geotechnical, downhole/surface/airborne geophysics, remote sensing, and well logs. In

Additional Data Search:
The LRE Team is looking to supplement State and Federal public data sets with less commonly known geologic data sets regarding layers that are compressible (clays) or soluble. We are also searching for time-series elevation data that could indicate land surface drop (subsidence).

addition, water-level and pumping data will be important for evaluating empirical subsidence relationships.

The LRE Team is collecting these data from the TWDB, U.S. Geological Survey (USGS), Groundwater Conservation Districts (GCDs), and other sources such as the Regional Water Planning Groups (RWPGs).

PROJECT PERIOD

The LRE Team began work on the Project in April 2017, and will complete their work by April 11, 2018, when the team submit its final report to the TWDB.

PROJECT BACKGROUND

As stated in Section 36.0015 of the Texas Water Code, one of the purposes for the creation of GCDs is to control land subsidence. Land subsidence may occur due to natural compaction, drainage of organic soils, sinkholes, mining and other causes. However, aquifer-system compaction due to depressurization caused by groundwater pumping is one of the primary causes of land subsidence.

Extensive research has not been conducted on the possibility of subsidence in various regions of Texas with respect to groundwater pumping (other than in the areas of the Harris-Galveston and Fort Bend Subsidence districts). When surface water resources are restricted, due to drought or water use, reliance on groundwater increases. Therefore, land subsidence caused by aquifer system compaction may be initiated or re-initiated in areas vulnerable to subsidence. Identifying areas at risk and careful monitoring of those areas is crucial for predicting and managing land subsidence.

For more information about this project, please contact our Project Manager Dr. Jordan Furnans, Vice President and Manager of Texas Operations for LRE Water, at Jordan.Furnans@LREWater.com or at (512) 736-6485, or Ms. Velma R. Danielson, Senior Project Manager, Blanton & Associates., Inc. at velma.danielson@blantonassociates.com or at (210) 854-9374. More information is also available from the project's primary contact at the TWDB, Mr. Robert Bradley, at robert.bradley@twdb.texas.gov.