



Brackish Resources Aquifer Characterization System

Groundwater contains dissolved minerals, measured in units of milligrams per liter, and can be classified as fresh (0–1,000 milligrams per liter), brackish (1,000–10,000 milligrams per liter), or saline (greater than 10,000 milligrams per liter). Brackish groundwater is abundant in the state, estimated at more than 2.7 billion acre-feet. Presently, public entities are desalinating brackish groundwater to produce drinking water. As a result, it is important to better understand this resource.

BRACS Overview

The Brackish Resources Aquifer Characterization System (BRACS) program was established in 2009 to map and classify brackish groundwater in the state. Of the 31 designated major and minor aquifers in Texas, 27 are known to contain brackish groundwater.

Using water well data and geophysical well logs, the Texas Water Development Board (TWDB) maps the geologic structure of an aquifer, estimates the salinity of water in the aquifer, and enters the project information into the BRACS Database that the TWDB developed to store and analyze the information.

In 2011, the TWDB completed a pilot study on the Pecos Valley Aquifer in West Texas to establish the methods of data analysis for future brackish groundwater studies. A typical study includes mapping aquifer structure, assessing existing water quality, gathering hydraulic information, and estimating brackish groundwater volumes. Project deliverables include preparing a report with supporting geographic information system files, database files, and digital geophysical well logs. Information used in these studies is available to the public.

BRACS Projects

The TWDB funded three projects in 2011 using grants provided by the legislature. The first project identified geophysical well logs that could be used to map the geologic structure of aquifers and estimate the salinity of groundwater across Texas. The logs were then scanned into digital images and entered into a database. The BRACS Database now has more than 70,000 logs available.

The second project compiled a bibliography of more than 7,500 reports, articles, and graduate research papers with an emphasis on Texas geologic formations containing brackish groundwater into a

relational database. This database serves as a source of reference for evaluating existing geologic information for a project area.

The third project assessed computer software capable of modeling different densities of groundwater found in brackish aquifers. A project report and a modeling code selection tool were developed to help users select the appropriate software.

BRACS Studies

The TWDB has completed 12 BRACS studies and has 5 ongoing studies.

Completed Studies

- Northern Trinity Aquifer (2018)
- Lipan Aquifer in Texas (2018)
- Blossom Aquifer (2017)
- Nacatoch Aquifer (2017)
- Blaine Aquifer (2016)
- Carrizo-Wilcox Aquifer (2016)
- Gulf Coast Aquifer (2016)
- Rustler Aquifer (2016)
- Queen City and Sparta aquifers in McMullen and Atascosa counties (2014)
- Gulf Coast Aquifer in the Lower Rio Grande Valley (2014)
- Gulf Coast Aquifer in the Corpus Christi Aquifer Storage and Recovery Conservation District and Surrounding Counties (2012)
- Pecos Valley Aquifer in West Texas (2012)

Ongoing Studies

- Wilcox, Carrizo, Queen City, Sparta, and Yegua aquifers in Central Texas
- Queen City and Sparta aquifers in central Texas
- Hill Country Trinity Aquifer
- Dockum Aquifer
- Edwards-Trinity (Plateau) Aquifer

House Bill 30 Projects

In 2015, the 84th Texas Legislature passed House Bill 30 directing the TWDB to conduct studies to identify and designate brackish groundwater production zones in four specific aquifers and present

findings by December 1, 2016. The legislation further requires the TWDB to complete zone designation in the remaining aquifers that meet House Bill 30 requirements by December 1, 2022. On October 20, 2016, the Board designated eight brackish groundwater production zones in the Carrizo-Wilcox, Gulf Coast, and Rustler aquifers. No zones were designated in the Blaine Aquifer. In March 2019, the Board designated an additional 23 production zones in the Blossom, Nacatoch, and Northern Trinity aquifers. No zones were designated in the Lipan Aquifer.

How can we use the information?

The scientific work conducted in House Bill 30 zone designations and BRACS studies is of great value as the entire aquifer is mapped and characterized, which is the first step for anyone considering brackish groundwater desalination. Stakeholders can use the BRACS Database information to map the resource in areas of interest. Then they can identify areas of highest production and economic potential and conduct tests to obtain site-specific groundwater data conditions.

More Information

To learn more about the TWDB's BRACS activities, please visit:
www.twdb.texas.gov/innovativewater/bracs/.

Or please contact:

John Meyer

john.meyer@twdb.texas.gov

(512) 463-8010