

Brackish Water Resources of the Gulf Coast Aquifers in Texas

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Abstract

The demand for fresh water continues to increase in Texas. By 2050, the population of Texas is predicted to double and the water demand is expected to increase 18% (3 million acre-feet/year increase) according to the Texas Water Development Board. Gulf Coast aquifers (Eocene-aged Wilcox to Pleistocene Chicot Formations) contain a large volume of brackish water (less than 10,000 ppm TDS) that may be feasible for desalinization to help meet the increasing demand. Several factors facilitate (or force) the use of brackish water for water supply, including decreasing supplies of fresh ground water and surface water, improvements in treatment technology, increased competition for surface water resources, and changes in population/demand centers. Conversely, desalinization of brackish groundwater has impediments, including cost, impact of brackish water withdrawal on fresh ground-water resources, and brine disposal issues.

The quality and volume of brackish water in the down dip sections of Gulf Coast aquifers have been estimated to determine which areas are suitable for brackish water production. The down dip extent of brackish water has been mapped by review of geophysical logs and review of available water chemistry. The maps indicate that the extent of treatable brackish water (based on a 3,000 or 10,000 ppm TDS) is significantly greater for many aquifers. For example, the availability of treatable brackish water in the Carrizo-Wilcox aquifer generally extends about 20 miles farther down dip from the fresh water (<1000 mg/l TDS) line. In addition, many of the Texas counties overlying Gulf Coast aquifers, particularly in South and East Texas, contain variable quality ground water with TDS values greater than 1000 mg/l in some areas, even though the brackish water line is farther down dip. By recognizing this brackish groundwater as treatable, significant additional reserves become available in these "fresh water" aquifers.