

### 3.2.5 Marathon

The Marathon aquifer is located in the Marathon Basin in Brewster County in West Texas, as shown in Figure 37. The aquifer is composed of a series of water-bearing formations, including the Marathon Limestone, which is the most productive formation in the area, as well as several other formations that yield lesser amounts of water to wells in the area. Most of the wells that produce from the aquifer are used for domestic and livestock purposes, with the exception of public supply wells in the town of Marathon.

While the Paleozoic rocks in the Marathon Basin are thousands of feet thick, most of the groundwater production in the area occurs at depths of less than 1,000 feet. The occurrence of groundwater is largely controlled by the geologic structure of the area. Most of the production is from the Marathon Limestone where upfolding has brought this formation to relatively shallow depths and the groundwater is under water-table conditions. Groundwater is produced from crevices, joints, and other cavities in the limestone. Where the Marathon Limestone is found at greater depths, the groundwater is more likely to occur under artesian (confined) conditions.

As with some other aquifers in this area of Texas, the Marathon aquifer has been penetrated by very few wells, and therefore there is a significant lack of data to evaluate the properties of the aquifer. No data exist on which to base aquifer hydraulic characteristics, nor to determine groundwater flow characteristics. Groundwater in the Marathon aquifer likely moves to the south and southeast toward the Rio Grande. Well yields range from 10 to 300 gallons per minute. The only wells producing significant quantities of water are producing from a fault zone in the City of Marathon. Based on well yields from wells producing from the Marathon aquifer and characteristics of similar aquifers, transmissivities may be less than 5,000 gpd/ft, with storage coefficients of  $1 \times 10^{-4}$  to  $1 \times 10^{-5}$ .

Recharge to the Marathon aquifer is from the infiltration of precipitation and stream runoff. Estimates of annual recharge are approximately 25,000 acre-feet/year<sup>1</sup>. Discharge from the aquifer is from springs, evapotranspiration, underflow toward the Rio Grande, and from pumpage. However, pumpage only accounts for 400 to 500 acre-feet/year of the total discharge, and discharge to springs is estimated at only about 1,000 acre-feet/year, meaning that much of the water in the aquifer is discharging through either underflow to other aquifers, or to evapotranspiration.

Most of the water produced from the Marathon aquifer is of good quality, with total dissolved solids generally less than 1,000 mg/L. No data exists to evaluate the existence of brackish water at deeper depths.

## Summary

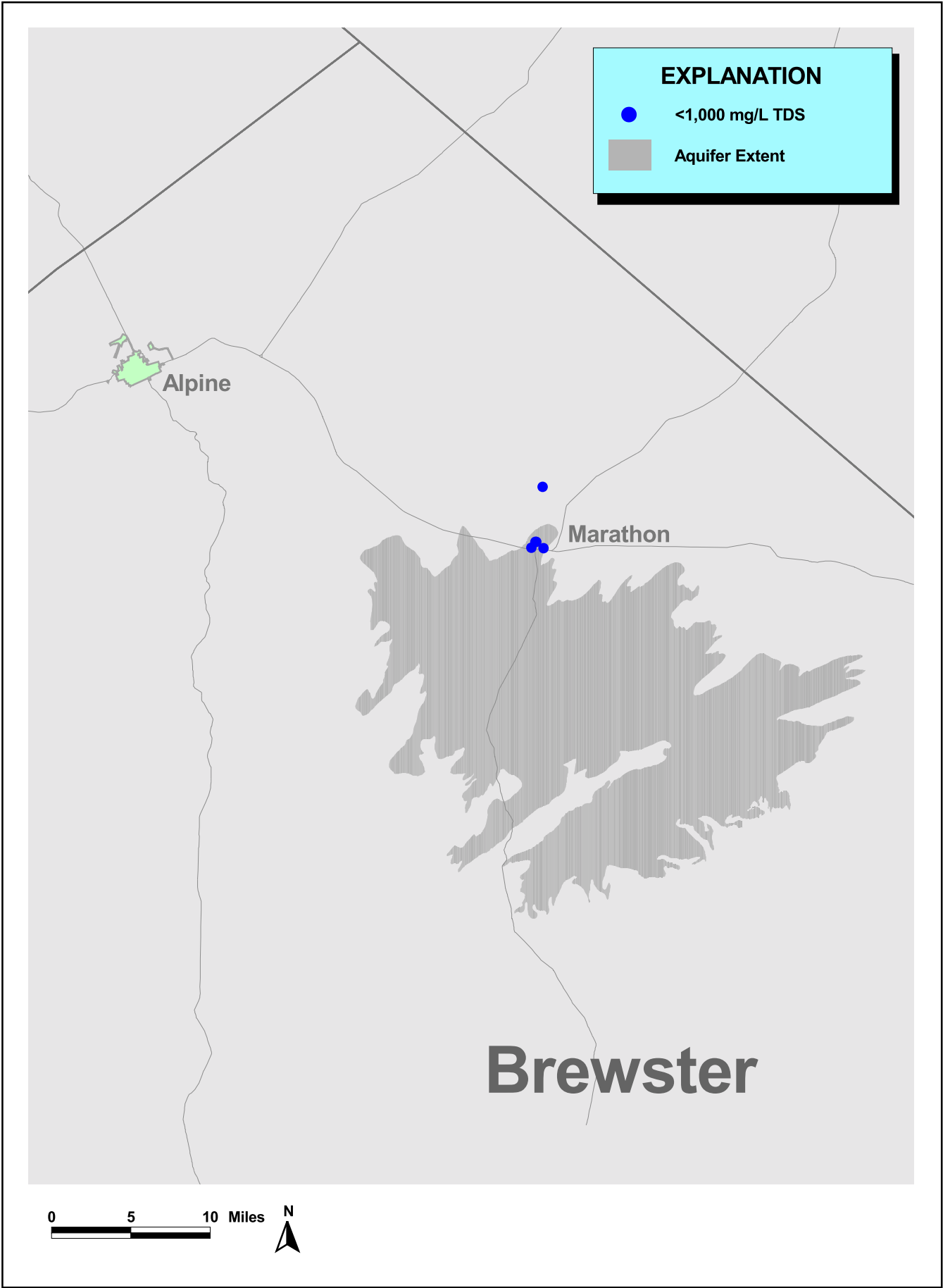
In summary, the Marathon aquifer is largely an unused aquifer in West Texas that may contain some slightly- to moderately-saline groundwater, especially in deeper sections. However, nearly all of the existing wells completed in this aquifer are in the shallower, fresh water sections, and no data exist to evaluate the potential for the existence of brackish water. The TWDB is currently conducting an update study on this aquifer.

Availability- UNKNOWN

Productivity- UNKNOWN

Source Water Production Cost- UNKNOWN

Summary of Brackish Water In the Marathon Aquifer			
<i>Region</i>	<i>Availability</i>	<i>Productivity</i>	<i>Source Water Production Cost</i>
E- Far West Texas	Unknown	Unknown	Unknown



**GROUNDWATER QUALITY  
IN THE MARATHON AQUIFER**

**FIGURE 37  
LBG-GUYTON ASSOCIATES**