

RESPONSE 53

4.0 HYDROGEOLOGY

The most significant regional aquifers in the vicinity of the site are, in the order of their importance, the Cretaceous Edwards Limestone, the Cretaceous Trinity Group, and Quaternary alluvial deposits (Brune and Duffin 1983). In accordance with 30 TAC 330.63(e)(3), the following discussion provides a description of these aforementioned regional aquifers based upon available published and open-file sources. The stratigraphy of the Temple area and water-bearing characteristics are summarized on Table III-4-1. Chemical characteristics of the aquifer units are summarized in Table III-4-2.

4.1 Regional Hydrogeology

The regional subsurface aquifers have been disrupted by faulting within the BFZ, which is located 2 miles northwest of the Site. Flow rates vary laterally within each aquifer, especially in areas where the aquifer is displaced by faults. This displacement has resulted in restriction of groundwater flow, particularly in the Edwards and Trinity aquifers, which has resulted in high concentrations of dissolved solids (Brune and Duffin 1983). Although the displacement has restricted groundwater flow in the individual aquifers, this may allow interconnection between aquifers regionally. The faults from the BFZ affect the groundwater movement, particularly in the Edwards and associated limestones in which the faults have formed natural paths for solution channels and also have formed underground barriers (Brune and Duffin 1983). The three units of the middle Trinity aquifer are hydraulically connected to some extent due to the fault system (Brune and Duffin 1983). Regionally aquifers may be interconnected to some extent, but shown on Figure III-4-6 there are no faults within two miles of the Site.

The following is a discussion of the significant regional aquifers.

4.1.1 Edwards and Associated Limestones

The Edwards aquifer pinches out southwest of the site and extends to the Lampasas River in Southern Bell County, but is included here as part of the regional aquifer discussion. The Edwards aquifer is located within the BFZ in the south-central portion of Bell County, southwest of Temple. Figure III-4-9.3 present the water level elevations of the northern segment of the Edwards aquifer. The water levels in this segment of the Edwards aquifer range from 550 to 750 feet-mean sea level. The potentiometric surface slopes east-northeast in this region. The source of recharge for the Edwards aquifer is from precipitation in the drainage areas west of the BFZ. Precipitation infiltrates the subsurface through numerous scattered dissolution features and faults, which act as conduits for recharging the limestone aquifers. ~~Areas of aquifer recharge are illustrated in Figure III-4-8, which shows where the Edwards aquifer outcrops.~~ In the BFZ, the entire aquifer is usually saturated and water may occur under artesian conditions (Duffin and Musick 1991). The groundwater in the Edwards aquifer is not recommended for drinking near its downdip limit of fresh to slightly saline water, where higher concentrations of dissolved minerals occur (Duffin and Musick 1991). As shown in Figure III-4-5, the Edwards Formation is overlain