

DEVELOPMENT OF A REVISED REGIONAL HYDROGEOLOGIC FRAMEWORK FOR THE FLORIDAN AQUIFER SYSTEM USING GEOPHYSICAL LOG MARKER HORIZONS

Lester J. Williams, Jessica E. Raines, and Amanda E. Lanning

AUTHORS: U.S. Geological Survey, 3039 Amwiler Rd. Suite 130 , Atlanta, Georgia 30094

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Abstract. During the process of updating the regional hydrogeologic framework of the Floridan aquifer system a series of subtle geophysical markers were found to be important in helping to define and correlate high and low permeable zones in the relatively thick carbonate rocks that comprise this aquifer system. Although none of the marker horizons are regionally persistent, they are critical in understanding the position and lateral continuity of the water-producing zones. The factors that control permeable variations in the Floridan aquifer system include (1) rock type, (2) structure, and (3) the proximity of the rocks to the recharge areas and the active flow system where more vigorous dissolution occurs. Among these factors, rock type is the principal control. Many of the highly permeable beds or zones in the system occur at major lithologic contacts or in thinly bedded carbonate sequences that are more susceptible to dissolution and development of secondary porosity and permeability. Once a particular sequence of rocks was identified that was important to the framework, geophysical markers were used to map these units up and down dip to better define the internal structure of the system. Distinctive geophysical log patterns are identified in a soft, poorly indurated limestone lithology, a massive dolostone lithology, thinly bedded limestone-dolostone and evaporite lithology, and a fine-grained limestone lithology.