

**WATER-SUPPLY POTENTIAL  
OF THE MIDDLE FLORIDAN AQUIFER  
IN SOUTHERN BEAUFORT COUNTY, SOUTH CAROLINA**

Report to the Town of Hilton Head Island  
Water Commission

By

Constance E. Gawne, Ph.D.

and

A. Drennan Park

Prepared October 15, 1992, in cooperation with the  
Town of Hilton Head Island  
and  
Hilton Head Plantation Utilities

South Carolina Department of Natural Resources

Water Resources Open-File Report 9

## SUMMARY

The middle Floridan aquifer is a thin limestone sequence whose permeability principally evolved from the dissolution of aragonitic shell material. At Hilton head Island, the top of the aquifer occurs at about 500 ft below land surface and the aquifer's thickness ranges from 30 to 60 ft. Fine calcarenites and calcilutites containing minor amounts of sand and clay adjoin the more permeable middle Floridan and behave as semiconfining units.

Aquifer tests were made at six locations and usually consisted of both drawdown and recovery measurements in each middle Floridan well. Measurements also were taken in nearby upper Floridan wells. The transmissivity of the middle Floridan ranged from 2,300 to 26,700 ft<sup>2</sup>/day; the hydraulic conductivity in productive zones identified by flowmeter logs ranged from 220 to 290 ft/day. No response was apparent in the upper Floridan wells.

The middle Floridan was modeled by formulating a second confining unit and third aquifer for the upper Floridan model of Smith (1988) – steady-state conditions are simulated. The effects of reducing upper Floridan withdrawals to 9.5 mgd and of adding 1.14 mgd of pumping in the middle Floridan were modeled. Simulations indicate that a 1.14-mgd withdrawal from the middle Floridan would increase inflow in the upper Floridan aquifer by 4 to 5 percent; shifting the withdrawals southward does not reduce this additional inflow. Pumping 1.14 mgd from the middle Floridan could result in an average of about 0.3 ft of drawdown in the upper Floridan.

Water in the middle Floridan aquifer is fresh beneath the mainland, brackish at Hilton Head Island, and moderately saline at Parris Island. Chloride concentrations range from 8 to 4,250 mg/L, and total dissolved solids range from 232 to 8,940 mg/L.

