

The U.S. Geological Survey is conducting a series of regional water-resources investigations under the Regional Aquifer System Analysis program (Chase and others, 1983, p. 52). One part of this program is a regional study of the Tertiary and Quaternary aquifer systems of the Mississippi embayment-West Gulf Coastal Plain, which includes all of the State of Louisiana. The regional study was started in 1980; a more detailed subregional study in Louisiana was started in 1982.

One of the principal goals of both the regional and the subregional studies is to define the flow paths of water in the major aquifer systems and the interactions of the systems. The geohydrologic sections shown here represent an initial step in defining the aquifer systems. Section A-A' is located approximately on the strike along the western part of the Mississippi embayment. Section B-B' is approximately along the dip across the Monroe uplift and the western part of the Mississippi embayment. In northern Louisiana, the major hydrologic units correspond closely to the geologic units as shown on the sections and in table 1.

Thick, areally extensive clays of the Midway Group form a regionally effective confining layer beneath the overlying undifferentiated Wilcox Group and younger sediments that are the object of the regional study. No attempt was made to subdivide the Midway Group. Clays of the Vicksburg and Jackson Groups function hydrologically as a unit. For this study, these groups are mapped as an undifferentiated confining layer that subdivides the Cenozoic sediments into two major aquifer systems.

The lower major aquifer system consists of aquifers in the undifferentiated Wilcox Group and the Claiborne Group. Within the Claiborne Group, the Sparta Sand and the Cockfield Formation contain major aquifers whereas the Cane River and Cook Mountain Formations form confining beds. The Carrizo Sand at the base of the Claiborne Group is discontinuous across northern Louisiana and is hydraulically connected to sands in the underlying Wilcox Group. The Wilcox Group and the Carrizo Sand function hydrologically as a unit—the Wilcox-Carrizo aquifer.

The upper major aquifer system comprises all of the sediments above the clays of the Vicksburg and Jackson Groups. North of the outcrop-subcrop belt of the Vicksburg and Jackson Groups (see index map) the upper aquifer system consists of thin, discontinuous alluvial and terrace deposits of Pleistocene and Holocene age over an erosional surface of pre-Jackson beds. In this area the upper aquifer system is not isolated from the lower system and serves as a source of recharge to or discharge from the lower aquifer system. Sand and clay of Miocene, Pliocene, and Pleistocene age thicken southward and eastward from the outcrop-subcrop belt of the Vicksburg and Jackson Groups and form aquifers used for fresh-water supply throughout much of central and southern Louisiana. Table 1 presents the chronostratigraphic sequence for the geohydrologic units identified in this report.

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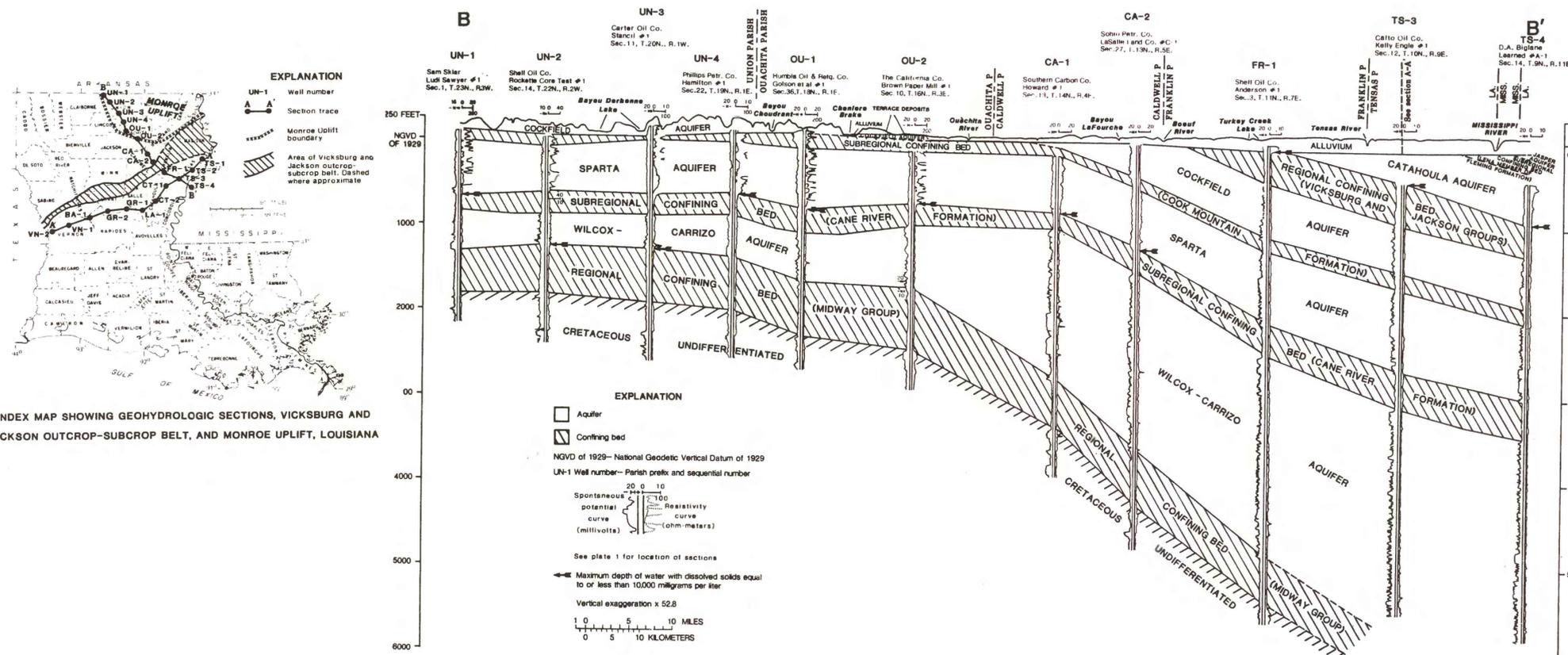
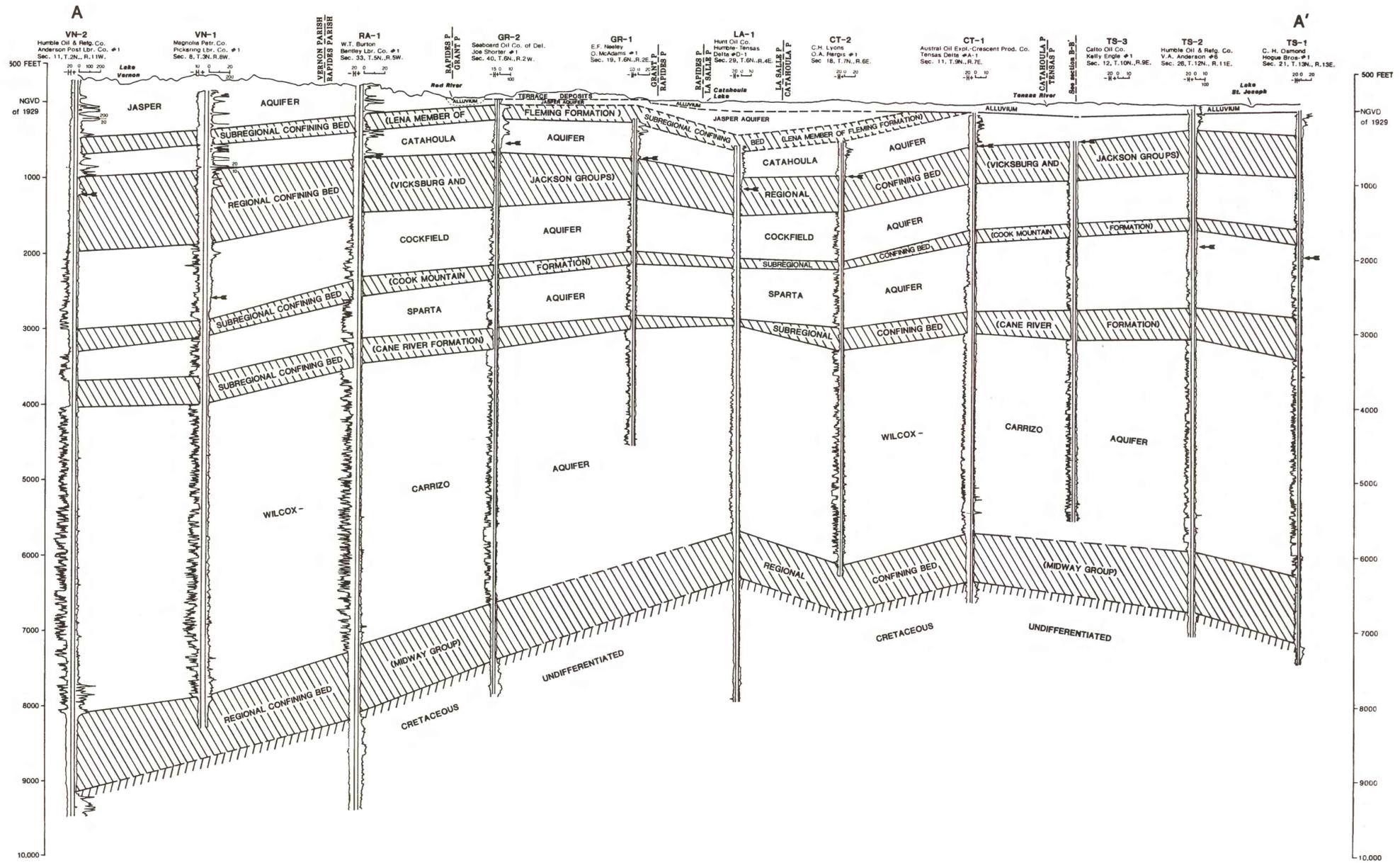
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EXPLANATION
UN-1 Well number
Section trace
Monroe Uplift boundary
Area of Vicksburg and Jackson outcrop-subcrop belt. Dashed where approximate

Table 1.—Generalized post-Cretaceous stratigraphic column for northern Louisiana area of geohydrologic sections

Era- them	Sys- tem	Series	Group	Formation and member	Hydrologic unit
Cenozoic	Quaternary	Holocene and Pleistocene		Alluvial deposits	Alluvial aquifers
				Terrace deposits	Terrace aquifers
		Miocene	Vicksburg	Williamson Creek Member	Jasper aquifer
				Dough Hills Member	Jasper aquifer
	Tertiary	Oligocene	Vicksburg	Lena Member	Lena confining bed
				Catahoula Formation	Catahoula aquifer
				Undifferentiated	Vicksburg and Jackson confining beds
		Eocene	Jackson	Cockfield Formation	Cockfield aquifer
				Cook Mountain Formation	Cook Mountain confining bed
				Sparta Sand	Sparta aquifer
Paleocene	Midway	Cane River Formation	Cane River confining bed		
		Carrizo Sand	Wilcox-Carrizo aquifer		
		Undifferentiated	Midway confining bed		
Mesozoic	Cretaceous	Upper	Undifferentiated	Not investigated	

INDEX MAP SHOWING GEOHYDROLOGIC SECTIONS, VICKSBURG AND JACKSON OUTCROP-SUBCROP BELT, AND MONROE UPLIFT, LOUISIANA

EXPLANATION
 [Symbol] Aquifer
 [Symbol] Confining bed
 NGVD of 1929—National Geodetic Vertical Datum of 1929
 UN-1 Well number—Parish prefix and sequential number
 Spontaneous potential curve (millivolts)
 Resistivity curve (ohm-meters)
 See plate 1 for location of sections
 Maximum depth of water with dissolved solids equal to or less than 10,000 milligrams per liter
 Vertical exaggeration x 52.8
 1 0 5 10 MILES
 0 5 10 KILOMETERS

GEOHYDROLOGIC SECTIONS, NORTHERN LOUISIANA

By Charles D. Whiteman, Jr. and Angel Martin, Jr.